

# **Rising seas, surprising storms: temporalities of climate and catastrophe in Vermont, New York and the Florida Keys**

Thesis submitted for the degree of Doctor of Philosophy



Rebecca Catarelli  
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Supervised by Dr. Derek McCormack

## Abstract

The phenomenon of climate change exists in a liminal state between denial and acceptance, past and future, theory and reality, problem and catastrophe, unfolding in the spaces between apparently stable forms. This thesis considers different temporalities emerging within this transition through a creative exploration of extreme weather and climatic events that seeks to foreground the idea of change itself. Research centers around the Florida Keys, a low lying archipelago that is widely expected to become uninhabitable in the next half century due to sea level rise, but only if the islands do not suffer a similar fate much sooner with the sudden arrival of a catastrophic hurricane. While most Keys residents are unconcerned about the growing reality of sea level rise, hurricanes are a constant threat generating a palpable atmosphere of anticipation and corresponding precaution. In resonance with this regular storm activity in the Florida Keys, the project also reflects on the coincidental occurrence of Hurricanes Irene (2011) and Sandy (2012), two errant and devastating storms that visited the northeastern United States over the course of this project and personally affected the author. Thus, extreme weather provides a material entry point into the complex and far-reaching event of climate change, offering an opportunity to theorize transition and to reflect on what might be creatively recuperated from cross currents of climate and catastrophe. In conclusion, the thesis proposes an ontology inspired by the unique reproductive strategy of the mangrove plant that has thickly and extensively colonized the coastline of southern Florida and through which events are understood to possess qualities of latency, accrual and distribution and to give rise to a future that is germinal, a present that is continuously resignified and a past that remains profoundly creative.

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...I'd have  
nightmares of other islands  
stretching away from mine, infinities  
of islands, islands spawning islands,  
like frogs' eggs turning into polliwogs  
of islands, knowing that I had to live  
on each and every one, eventually,  
for ages, registering their flora,  
their fauna, their geography.

- from 'Crusoe in England' by Elizabeth Bishop (2008)

## Introduction: Archipelagos



Figure 1. 1940 postcard of the Overseas Highway [Curt Teich and Co., Inc.]

### The Overseas Highway

The Florida Keys form a chain of 1,700 low-lying coral islands stretching southwest from Miami into the Gulf of Mexico, connected by an elaborate roadway extending to the archipelago's farthest populated island of Key West. A trip down the length of this Overseas Highway from mainland Florida involves a 127-mile journey over an impressive stretch of bridges and causeways with the traveler afforded constant views of the tropical blue sea and its scattered mangrove islands. Passing through sleepy fishing villages, protected areas, and lively resort towns, the Overseas Highway ends in the city of Key West, the southernmost point in the contiguous U.S., facing Cuba across only 90 miles of water. The Keys endure a fragile existence so far out in the ocean, negotiating the edge between land and water, the U.S. and the Caribbean, the Atlantic Ocean and the Gulf of Mexico. The islands are only five feet above sea level, on average, and are expected to become uninhabitable in the next half century according to even the most conservative sea level rise predictions. Yet the Keys could suffer a similar fate much sooner with the sudden arrival of a catastrophic hurricane, an

event with a one in seven chance of occurring in any given year (Jordan 2007, 16). Since they became part of the U.S. in 1822, the Keys have been affected by dozens of powerful hurricanes, delivering storm surges and violent winds that devastated sizeable stretches of the island chain. To complicate the already significant challenges facing residents, the archipelago's fragile infrastructure, including the Overseas Highway with its 43 bridges connecting 38 islands to the mainland, is aging, delicate and incredibly expensive to maintain.

Infrastructure extending the length of the archipelago was originally created to support economic ties between Key West and pre-revolutionary Cuba, with Havana just a short boat ride away. Henry Flagler, who founded Standard Oil with John D. Rockefeller, personally funded the Overseas Railroad extending from Miami to Key West, which remained an isolated outpost until the completion of the railroad in 1912. A journey from New York to Havana, including a short ferry trip at the end, took only three days, which greatly reduced the transport time for people and goods and was expected to increase Flagler's already considerable fortune. During the seven-year construction process, however, three hurricanes nearly derailed the project and Flagler died soon after completion, leaving the railroad neglected in the conflict over his estate before it was ultimately destroyed by the Labor Day Hurricane of 1935. The abandoned railroad bridges were eventually acquired for the Overseas Highway, which was gradually constructed as the railroad was falling into disuse. The Highway was first established as a unified thoroughfare in 1928 after a five-year project involving the construction of bridges, causeways and car ferry terminals. The initial trip down the Highway to Key West took at least 8 hours under the best conditions and offered travelers an exhausting journey over precarious infrastructure:

The narrow rickety wooden bridges in the Lower Keys presented major challenges to motorists. When drivers met on these bridges, they passed each other very slowly with bated breath. It was impossible to get by a truck on a bridge. At night, trucks would stop and blink their lights before starting across,

and proceed only if no lights blinked back—no one wanted to back off one of those bridges (Marzyck, 2007: 143).

When upgrades were completed in 1938 there was no longer any need for ferries to carry vehicles between islands, considerably shortening the trip to Key West. By the 1970s the narrow railroad bridges were no longer adequate for the increased traffic and a third incarnation of the Overseas Highway was completed in 1982, including a new and wider Seven Mile Bridge, an engineering marvel connecting the middle Keys to geologically distinct lower Keys across a miles-long expanse of shallow water. Today, the Overseas Highway, known as U.S. 1 outside of the Keys, extends along the entire east coast of the country and can be followed for 2000 miles from Key West all the way to the Canadian border. Yet, as it runs through the Keys, the Highway often provides only a single lane of road in either direction and serves as a lifeline on which the Keys are utterly dependent.

Long before human engineering altered the landscape of the Florida Keys, the archipelago was formed and sustained largely by the work of mangroves rooting in the coral shallows and providing a natural infrastructure to fortify the islands against the “all-embracing sea” (Baldacchino, 2005: 248). A local historian, Jerry Wilkinson, showed me aerial photos from the 1930s in which the Keys were all ‘swampland’ prior to the 1950s development boom. The photos show a long stretch of mangrove islands, mostly undeveloped, with the new Overseas Highway appearing as a barely discernable line down the center of the largest Keys. With transportation advances came development and the eventual dredging of an extensive canal system to create more waterfront property and generate fill for man-made land on which to build even more houses. “The Chamber of Commerce doesn’t like me saying it,” Jerry explained, “but this is an artificial paradise.” In later aerial photos, the mangroves disappear and larger, neatly shaped islands emerge, cut through with rows of canals lined with vacation homes. Today the islands are sustained as much by complicated and elaborate

infrastructure as they are by the proliferation of mangroves, with an extensive system of water pipes, electrical wires and landfill stretching down the Overseas Highway. Along its length, a well-funded Mosquito Control operation constantly sprays larvicide from its fleet of aircraft, a service without which the Keys would become unbearable during the summer months. The local population of 73,000 full-time residents exists entirely because of this intensive infrastructural corridor that has been constantly rebuilt against the relentless ocean and repeated force of hurricanes in an “unhappy dialectic of human developments and natural elements” (Clark, 2011: 141). As sea level continues to rise at an increasing rate, these already problematic systems will become increasingly compromised and once they start to fail people will likely begin moving out of the Keys in droves.

### **Mapping the archipelago**

While islands like the Keys are often portrayed as bastions of natural beauty, innocence and simplicity (cf Greenhough, 2004; Peron, 2004; Royle, 2002), their human habitation can be a complex and labor-intensive reality in which the threat of destruction coexists with the lure of a tropical paradise. As Deleuze explains, “Humans cannot live, nor live in security, unless they assume that the active struggle between earth and water is over, or at least contained” (2004: 9). In the Keys this struggle has been ongoing for millennia as periods of glaciation have alternately covered and exposed the ancient coral reef that forms the bedrock of the islands and ocean currents, storms and mangroves continuously shift the thin layer of sand concealing the limestone. Today, this tension between land and water emerges in concert with the tension between past and future as rising sea levels gradually compromise infrastructure and historical storms foreshadow future destruction. It is here, between the prolonged event of sea level rise and the more surprising but more regular event of a catastrophic hurricane, that the Florida Keys provide an “idealised island laboratory” (Farbotko,

2010: 53) in which to experiment with environmental futures, to apprehend historical disasters in the passing present and to explore the continuously unsettled boundary between land and sea. As one informant explained to me, "It's a working metaphor: we're on the edge here". The Keys exist on the spatial and cultural margins of the U.S. while also inhabiting the increasingly critical temporal edge generated by the effects of rising seas and intensified by the continual hurricane threat. These edges and the transitions they signal are the preoccupation of this thesis as it engages with these two related but temporally distinct climatic risks threatening the Florida Keys while also responding to unexpected, geographically distant, and subjectively experienced climatic events in the northeastern U.S. as my own life was impacted by Hurricane Irene in 2011 and Hurricane Sandy in 2012.

Like the Overseas Highway, this narrative provides a conceptual bridge connecting resonating events that materialized through this research, with the Florida Keys themselves serving as a point of departure from which to theorize transition and to sketch out a world understood as radically liminal. I therefore aim to conceptualize the imminent disappearance of the Florida Keys, and climate change in general, "not as loss or failure, but as something altogether more complex" (DeSilvey, 2012: 33). As the Keys straddle the threshold of catastrophe and the dangers and challenges of climate change steadily increase, the islands are positioned to serve as a warning as they actualize broad climatic shifts that would otherwise be largely invisible in the U.S. as a whole. The Keys are often referred to as a 'canary in a coal mine', and building on this analogy I am less concerned with the circumstances surrounding the canary's entrapment or even its self-awareness as it waits to perish; instead I am interested in various ways that time can be understood and experienced within the mineshaft during this event of change. Through the unique temporal dynamics of resonating climatic events, the Keys provide an opportunity to "think relations in transition" (McCormack,

2010: 206) as change accumulates and the climate passes from a more stable state into a condition of variation and unpredictability both in Florida and further afield.

The **first** aim of this thesis is therefore to theorize different temporalities through which the actual and possible effects of climate change come to matter. With a future that is conspicuously twofold, in which the potential for slow disappearance coexists with the potential for sudden destruction, local expectations in the Florida Keys diverge into distinct but intersecting possibilities, engendering not a single future but *futures* in plural. *How is the long-term risk of sea level rise in the Florida Keys complicated by the continuous risk of hurricanes and how do futures emerge in the context of climatic transition?* This thesis explores the way climatic events, including both catastrophic weather and long-term phenomena like sea level rise, germinate various and multiple future scenarios in the present, complicating ideas of time as linear, objective and consistent.

**Second**, this thesis aims to explore how climatic events materialize through specific arrangements of objects, activities, individuals, documents and policies, as well as through the residues of historical hurricanes understood through artifacts and processes of remembrance. *How are climate-related hazards and catastrophes materially anticipated, experienced and understood; how are they “presenced” (Leyshon and Geoghegan, 2012) in the Keys and the less frequently affected northeastern U.S.?* By understanding materialities as “precarious achievements enacted through finite alliances in a tensed world” (Anderson and Wylie, 2009: 320) it is possible to explore how for a thing to *matter* it must be brought into affective encounter with other things.

**Third**, this thesis aims to conceptualize the subjective experience and affective resonance of climatic events as understood through temporalities of rhythm and refrain. In the Florida Keys, the hurricane season generates a regular yearly rhythm of

anticipation and disaster preparedness, rendering the prospect of sea level rise both less alarming and more distant, and also inscribing local subjectivities with distinct experiences of climate, understood through weather and its regional patterns. Following Lefebvre's (2004) insistence that time is quantified through rhythmic measure and that lives and environments are composed of rhythms in constant resonance and interference with each other, this thesis explores the physical and affective rhythms of the "weather-world" (Ingold, 2005, 2007), asking *how can climate be apprehended through an understanding of local and institutional temporalities of preparedness, coping and remembrance and how do these temporalities inhere in and around climatic events?* The occurrence of hurricanes Irene and Sandy has opened the discussion of climate across spaces and times, forcing a consideration of change not only in places where hurricane rhythms are much less pronounced, but also, and more awkwardly, how these events resonate in the context of my own life. Therefore, a corresponding aim is to bring these very germane but essentially personal events into discussion with similar but more urgent concerns in the Florida Keys, a distant location that is climatically distinct and far more accustomed to these events.



**Figure 2.** The Florida Keys depicted in a map from 1914 [*The New Student's Reference Work*, 1914<sup>1</sup>]

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<sup>1</sup> available under a Creative Commons Attribution-Noncommercial license.

## **A history on the edge**

European explorers first encountered the Keys in 1521 when Ponce de Leon landed on the island of Key West before travelling up the coast of Florida in search of the Fountain of Youth. Over the next three hundred years, the native Calusa tribe shared the Keys with marauding pirates until the islands became part of the United States in 1822. Early U.S. settlers grew wealthy off of 'wrecking', salvaging goods from trading ships that sank on the nearby reef and, as a result, by 1860 Key West had become the richest city per capita in the U.S. (Ogle, 2006). Descendants of these original settlers from the Bahamas still living in the Keys today are referred to as 'Conchs' after the large, abundant marine snail that is a staple of the local cuisine. The Keys have continuously reinvented themselves throughout the years, serving as the center of the sponge industry in the early 20<sup>th</sup> century, a base for rum runners during Prohibition, home to a thriving U.S. Navy base until the 1970s, a haven for drug smuggling in the 1980s and finally a popular tourist destination from the late 1980s to present.

Though it lies at the end of the archipelago, Key West is the social and cultural heart of the islands. With an area of five square miles and home to 25,000 permanent residents, the city is densely populated and steeped in history and culture. Roughly one third of the Keys' entire population lives on this southernmost island (Mozumder et al, 2011) and 40% of residents are originally from elsewhere, according to a representative of the Key West Business Guild. Social and cultural life in Key West continues to be dominated by the wealthy and prominent gay community that began to establish itself in the Keys in the 1960s, buying and renovating historical homes in an effort to preserve local culture. Today, the picturesque city is home to a thriving \$2 billion tourism industry, attracting more than three million visitors each year. A significant

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cruise ship presence has developed over the past 15 years with enormous vessels depositing up to 24,000 people in Key West for eight hours at a time on a regular schedule. Many locals are dismayed that these cruise ships are “cheapening” the tourist scene, with short-term visitors mostly patronizing commercial chains to the great detriment of local businesses and the vibrant art scene. Yet for a small community, Key West remains rich in cultural events, creative projects, and annual celebrations. It has been home to a number of well-known writers, including Ernest Hemingway, Tennessee Williams, Elizabeth Bishop and the children’s writer Shel Silverstein. The poets Robert Frost and Wallace Stevens also spent a number of winters in Key West and the city still harbors a thriving artistic community.

The proximity of Key West to Cuba is a continuous subject of interest in the Keys and the city is full of Cuban restaurants and gift shops, Cuban-themed hotels, Cuban music, Cuban immigrants and many locals have been to Cuba at some point, legally or otherwise. Several times a day US fighter jets fly over Key West on patrols of the border area and just outside of the city there is an aerostatic blimp continuously broadcasting American propaganda into Cuban airspace. The so-called ‘wet foot, dry foot’ policy, enacted through a 1995 revision of the Cuban Adjustment Act, entitles Cuban refugees to remain in the country if they manage to set foot on U.S. soil before they are apprehended. The Keys are the first point of contact for illegal immigrants drifting across the Straits of Florida in makeshift boats, and while most successful landings go unpublicized by local authorities, a notable report appeared in the Key West Citizen in September 2012, documenting one group’s surprising landing on Key West’s popular Higgs Beach. The article featured a photo of an ecstatic circle of Cubans sitting on the sand in the glow of the early morning tropical sun (Fifteen Cubans land, 2012). Though the Overseas Highway ends at the tip of Key West, this strong connection to Cuba constitutes a “bridge southward” understood in the Keys as

“a connection that is historic and natural but that is not presently realized” (Steinberg and Chapman, 2009: 293). With Raul Castro capitalizing the country, the border between Cuba and the US is expected to open ‘soon’ and Key West has had a contingency plan in place for the past 30 years in eager anticipation of this event. Recently, a ferry terminal was built to accommodate anticipated boat traffic, and in December 2013, the first flight between Key West and Havana since 1959 departed, carrying 7 locals, including Key West’s mayor (O’Hara, 2013). Though this flight was only a symbolic test run, it heralds increasing contact between the the two countries and provides evidence that the bridge southward is nearing realization.

Since 1982, the Florida Keys have been unofficially referred to as the ‘Conch Republic’ following a brief and largely whimsical declaration of independence from the U.S. in 1982 in protest against a Border Patrol blockade that crippled tourism in the islands (Goodwin-Nguyen, 2008). This roadblock along the Overseas Highway, set up to disrupt narcotics smuggling as well as intercept illegal Cuban immigrants, caused a 17-mile traffic jam that not only inconvenienced locals but sent the local economy into a state of disorder. In response, the Keys ‘seceded’ from the US, setting up a mock capital at Key West while protesting the injustice of the federal maneuver. Although the conflict was eventually resolved, Conch Republic Independence Day is still celebrated every year and souvenirs bearing the Conch Republic logo are a major source of income for local shop owners. This event and its subsequent appeal speaks to the marginal nature of the Keys and is “associated less with any claim to state power than with the island’s liminal identity, geopolitically within the borders of the United States but culturally outside mainland norms” (Steinberg and Chapman, 2009: 285). This liminal identity intensifies when considered alongside the regular threat of hurricanes and the more abstract threat of sea level rise, positioning islanders on the perpetual edge of catastrophe as well the outer margins of the country. With ocean water steadily

encroaching on roads, homes and pipelines, Keys history is poised again on the threshold of significant change as the islands face almost certain inundation and depopulation.

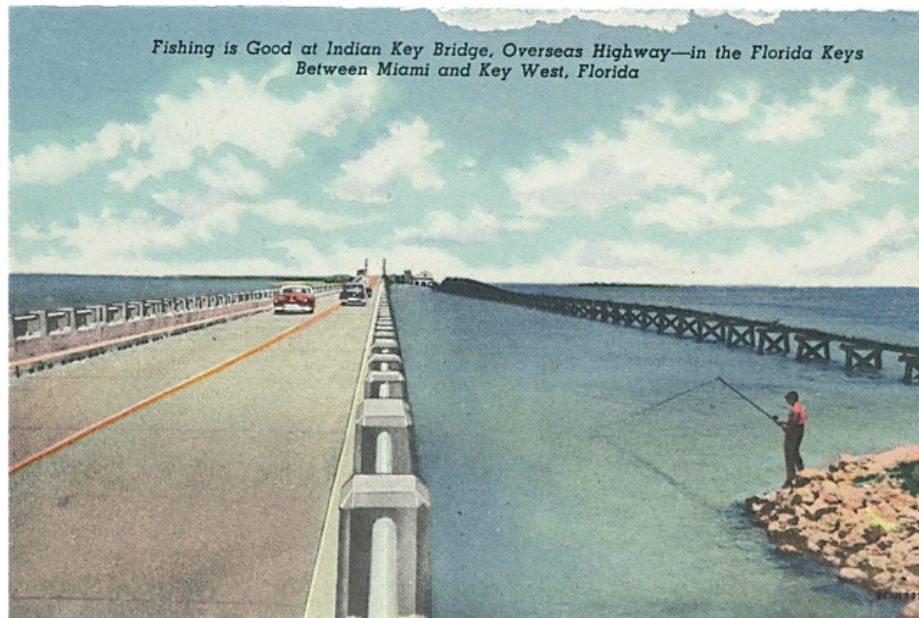


Figure 3. 1940 postcard of the Overseas Highway [Curt Teich and Co., Inc.]

### **Climate change and the Keys**

The global rate of sea level rise has increased steadily in recent decades and is expected to continue to increase over the next century by a considerable amount (IPCC 2014). The Florida Keys are notable in this regard as sea levels have been recorded in Key West since 1846, making it the longest continuously measured location in the U.S. (Maul and Martin, 1993). Over this time, the waters around Key West have risen 9 inches and a modest rise of another 10 inches in the next century, the minimum predicted by the 2014 IPCC report, will put significant portions of the islands under water during high tides (Hoegh-Guldberg, 2010). In Florida in particular, sea level rise is expected to have a devastating effect on coastal areas (Ross et al, 1994; Walton, 2007), yet although “Florida has more to lose with sea level rise than any other state,” it “has done less than any other coastal state to prepare for it” (Pilkey and Young, 2008). With 90% of the Keys’ land area at less than five feet above sea level (Hoegh-Guldberg,

2010) and, more generally, 5.5 million people living in the equally vulnerable South Florida Metropolitan Area immediately north of the Florida Keys, it is remarkable that in the face of rising seas, locals and investors alike continue development along the coastline, building condominiums, hotels and luxury homes directly on the beaches (Noss, 2011: 10).

While the growing reality of sea level rise barely registers for many Keys residents, hurricanes are a constant threat generating a palpable atmosphere of anticipation and corresponding precaution (cf Anderson, 2010a, 2010b; Massumi, 2005, 2007). The islands have suffered through 19 destructive storms in the 20th century and two already this century, enduring the recorded-breaking 2005 hurricane season in which the Keys were threatened by five consecutive storms. The population of the entire upper Keys was only 673 individuals in 1935 compared to around 40,000 today, and if a storm similar to the incredibly powerful Labor Day Hurricane were to strike now, the destruction would be astounding. Other notable hurricanes have ravaged the islands throughout the years, including Hurricane Donna in 1960 which flattened the fledgling city of Marathon in the middle Keys just as development was taking off. Hurricane Georges brought flooding, wind damage and two days of lawlessness in 1998. The Keys were devastated again in 2005 when Hurricane Wilma sent an 8-ft storm surge inland, completely inundating seventy percent of the islands. More than half of the homes in the Keys were flooded and tens of thousands of cars were destroyed, contributing to a significant population decline in the county in the past decade, despite a population increase in Florida as a whole. There is much speculation and debate about the effect of a warming environment on hurricane strength and activity: because hurricanes form in tropical regions over water heated to a temperature of 81°F or higher, it is generally understood that an increase in atmospheric and water temperatures will lead to an increase in the number and

intensity of hurricanes. However, the ocean-atmosphere system that controls the climate is so vast and complex that it is impossible to anticipate the real consequences of global warming. Although the intensity of storms will most likely increase with greenhouse gases in the atmosphere (Emanuel, 2004: 405), it remains unclear how frequently they may occur or how likely they would be to make landfall in the Keys.

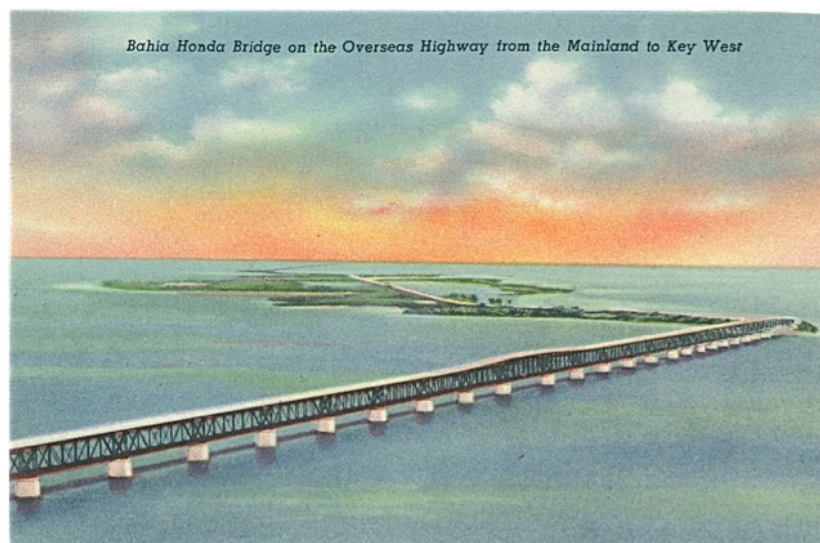
Between the dual threats of hurricane destruction and sea level rise, these marginal islands exist on the brink of catastrophe, and, in the context of Beck's (1992) risk society, the effects of either potential create a sizeable 'at risk' population in a remote and often hazardous location. However, a large percentage of Keys residents have relocated to the islands from elsewhere and the population is remarkably transient, resulting in a general lack of concern for sea level rise by locals with superficial attachments to the area. There is a largely childless gay community dominating Key West, a sizeable contingent of 'liveaboards' making their homes in boats docked at marinas throughout the Keys and the islands' multi-generational Conch families are selling their old homes at exorbitant prices and moving as a community, I was told, to North Carolina. However, even those who are more committed to the Keys will be forced to leave as there is nowhere to which even the wealthy can go to escape sea level rise without either drastically altering their lifestyle or abandoning the islands altogether (cf Klein and Smith, 2008). The Keys are so small and extend so far out into the ocean from the mainland, and with the added complication that all of southern Florida is in jeopardy, any safe location is at a significant geographical distance. While areas with the highest elevations in Key West and Key Largo may escape inundation, the rest of the islands will not be spared, leaving virtually nowhere for residents to move to escape the flooding while remaining in the Keys. As Beck explains of risk, "in a wholesale, egalitarian way it impairs everyone" (1992: 38): before long the entire island chain will be compromised. I was told that residents will start to relocate not

when the ocean is lapping against their houses but when infrastructure starts to fail and insurance rates become unaffordable, which could happen even sooner with a catastrophic hurricane. With the increasingly high cost of living in the Keys, the tipping point has already come for many locals.

The Florida Keys are, of course, not the only island chain threatened by sea level rise, nor is their plight the most tragic or the most publicized. A number of low-lying archipelagos in the Pacific and Indian Ocean have received greater media attention, benefitting from the “dramatic appeal” of “an island nation state facing total inundation” (Mortreux and Barnett, 2009: 105). The Maldives drew publicity in 2009 when then president Mohamed Nasheed and 11 of his cabinet ministers symbolically met underwater in full SCUBA gear to sign a document calling for global cuts in carbon emissions in anticipation of the Copenhagen Climate Conference. The small Pacific island nation of Tuvalu has also garnered interest as citizens attempt to gain refugee status in Australia and New Zealand. These archipelagos emerge as meaningful spaces ascribed with western notions of guilt and sacrifice (cf Connell, 2003; Mortreux and Barnett, 2009) as the idea of an entire impoverished nation displaced by the greed and over-consumption of the industrialized world creates “a victim subjectivity reliant on embodied displacement and articulated distress” (Farbotko and Lazrus, 2012: 383). This subjectivity, however, is imposed from the outside and strongly influenced by notions of race, class and mobility rather than local realities of adaptation and coping.

Undoubtedly, the circumstances of small and impoverished island nations like the Maldives and Tuvalu differ greatly from the Keys, a place in which the population is not only transient, relatively wealthy and easily moved, but also because the residents themselves are complicit in the same industrialized greed that is causing the islands to disappear in the first place. Yet parallels can be drawn between the Keys and these island nations in that despite external perceptions and ideas of victimhood, as Mortreux

and Barnett found in Tuvalu, “most people were not overly concerned” (2009: 110) about sea level rise, which was comparable to the situation I encountered in the Keys. In Tuvalu, housing, unemployment and infrastructural issues were of greater concern, creating circumstances in which “future problems are discounted heavily, and this may be even more the case for climate change because the timing and severity of future impacts is uncertain” (Mortreux and Barnett, 2009: 110). Likewise, in the Keys, locals were more concerned about employment, real estate prices, and hurricanes than they were about the unclear and indefinite prospect of sea level rise. While the situation facing the Keys is not a tragedy on the same scale as that occurring in the Maldives or Tuvalu, it is nonetheless distressing for citizens of the U.S. to witness part of our own country disappear under the ocean, an event that could force us to more thoroughly embody the reality of a changing climate on a national level in that it delivers a more localized “entrenched mythology of visual graspability” (Farbotko, 2010: 55). As the Keys are also subject to intense hurricane activity, they provide a twofold catastrophic awareness that complicates the prospect of sea level rise itself while offering the opportunity to consider different temporalities emerging from circumstances of risk and disaster.



**Figure 4.** 1940 postcard of the Overseas Highway [Curt Teich and Co., Inc.]

## Archipelagos

The present day Florida Keys are situated between a relatively stable past and a very uncertain and vastly divergent future, offering an opportunity to “commune for a moment with a drop of time itself” (Connolly, 2011: 2) as the archipelago is gradually overtaken by the ocean. Several locals I spoke with during my time there felt very strongly that the islands are currently feeling the effects of sea level rise: boats are sitting higher against their docks and seawater stretches across roads during high tide. With more storms, higher sea levels and failing infrastructure, vulnerability will only increase. Within the environmental community it is widely believed that in the near future the U.S. government will invest in protecting Key West and Key Largo, the Keys’ population centers at the highest elevations, and everything in between will become a frontier-like area of abandoned property, state parks, small settlements of stilt houses or some combination of these. This low-lying archipelago has become a place “in ferment. It has gone “critical”” (Massumi, 2002: 109), becoming “a knot of mutually implicated alternative transformations of itself, in material resonance” (2002: 109-110). The Keys, in other words, are “*hypermutable*” (Massumi, 2002: 109, original emphasis): they are not only liable to change but are in the midst of experiencing significant but still indeterminate change. In their present state, the islands offer a compelling space of potential, uncertainty and susceptibility, giving way to a future that could unfold in any number of ways. The Keys, in other words, provide the “asymmetry of an opening” (Clark, 2011: 58) in which we have the opportunity

to stretch out this vulnerability in order to take in the practice of writing – or thought, or research, or critique – so that ‘our’ position as respondents to a crisis is not simply one of observing from a safe distance...but of being caught up in the machinations of the event (2011: 58).

This thesis takes advantage of this space of vulnerability in order to engage the idea of time itself, exploring how it materializes in the middle space of an event-in-progress. As

the ocean rises and storms intensify, the Keys have little time remaining as a habitable location, generating an experience of temporality that is both intensive and multiple.

I arrived in the Keys expecting to explore local concerns about climate change only to find that those concerns were limited largely to environmental activists and those involved with the construction and maintenance of county infrastructure. While this development seemed to hinder the project, it quickly became clear that a lack of concern for sea level rise manifested in a very real and urgent concern for the more pressing threat of a catastrophic hurricane. Six years prior, hurricane Wilma had delivered a devastating storm surge and the trauma of this event was still clearly evident throughout the Keys. As Wilma moved west to east along the northern edge of the islands, a wall of ocean water completely and unexpectedly submerged almost the entire archipelago, with not a single island spared. The damage was staggering: countless cars were ruined, thousands of homes were destroyed, most of the islands' vegetation died, and a cloud of despair settled over the Keys in the aftermath. With this event so recently occurring, any discussion of sea level rise almost always turned into a conversation about hurricanes. Likewise, I would soon learn first-hand how all-consuming these powerful storms can be: between field visits to the Keys I was at home in Vermont, 1500 miles away, when Hurricane Irene made landfall in the northeastern U.S. in August 2011. The rainfall was extreme, causing local rivers to flood, forcing emergency evacuations and washing a number of houses in our town completely off their foundations and down the river. We were stranded at home for four days without any functioning infrastructure amid a community of panicking neighbors. It was uncanny to experience this hurricane first-hand in the rarely affected northeastern U.S. while immersed in a study addressing hurricanes in the Florida Keys. But the coincidence would not end there: over a year later, after I had returned to the U.K. to begin the process of writing, the project was impacted by yet another hurricane when

my the city I grew up in, Long Beach, New York, was inundated by a 12 ft storm surge as Hurricane Sandy made landfall in October 2012. I watched, alarmed and transfixed, from across the ocean as the place that I called home for the first 18 years of my life suffered unprecedented flooding and friends and family lost homes and possessions in the deluge.

These hurricanes occurred as surprise events against the backdrop of the more foreseeable though less immediately distressing experience of climate change in the Florida Keys and through their surprising coincidence with my project this work developed as an unforeseen chain of resonating events in parallel with the island chain that was my original area of focus. Archipelagos emerge not only as a series of related islands, like the Florida Keys, but also as a series of related events or ideas that can be linked together through a process of *archipelagraphy* (DeLoughrey, 2001) to enact “a form of counter-mapping” (Stratford et al, 2011: 114) that functions as a “representation of identity, interaction, space and place that comes across in different combinations of affect, materiality, performance, things” (2011:114). The Florida Keys are used here not only to consider their physical circumstances which see them gradually disappearing under the ocean in the next century but also as a point from which to assemble a narrative that, like the Overseas Highway, forms an “intensive bridge” (Guattari, 1995: 59) between spatially and temporally distinct events. Stanford et al propose the archipelago as “a conceptual tool too little drawn upon”, suggesting that it could be effectively used “to break out of stultifying and hackneyed binaries; privileging instead the power of cross-currents and connections, of complex assemblages of humans and other living things, technologies, artefacts and the physical scapes they inhabit” (2011: 125). Archipelagraphy is used here to bridge the problematic gap fundamental to a number of well-established dualisms, including time and space, past and future, virtual and actual, internal and external, and ocean and

land. This tool also works to advance the idea of *liminality* as a transitional concept through which to both complicate these dualisms and to navigate the spaces between events-as-islands, an approach that I address in greater detail in the following chapter. The archipelagic model, with its emphasis on cross-currents, enables an initial interest in sea level rise in the Florida Keys to traverse space and time to include the remembrance of historical catastrophes as well as the subjective experience of two hurricanes affecting the geographically distant northeastern U.S. These temporally and spatially distinct events surfaced unexpectedly throughout the fieldwork process and emerged as a chain of constituent islands joined together through circumstance, resonance and affinity.

Climate change is neither a fixed occurrence nor a unified truth; instead it is a transient and unsettled phenomenon causing a multiplicity of experiences for the diverse inhabitants of the earth. Therefore, our response is not only a matter of knowledge, legislation or justice but is a problem of relational ethics in that climate change is a visceral, participatory and processual event. This research finds a way to theorize this transition by considering how climate change exists not just as harmful causes and damaging effects but also as present and pre-personal *affects* that shift, circulate, and coalesce into felt transformations in the environment. This idea is drawn out as a string of speculative islands through which the climate manifests as a phenomenon of shifting and contingent temporality and climate change itself is made up of diverse events that interweave to “form the texture of time” (Whitehead, 1978: 53). These islands compose a counter-map which, through its emphasis on cross-currents and connections, operates as an exploration of change that moves between ideas along a conceptual Overseas Highway through which “Expression’s impulse travels through the chain, creatively changing forms along the way” (Massumi, 2002: xxvi). The outcome is an archipelagraphy of climate and catastrophe that bridges

disparate material, participatory and theoretical engagements with our changing climate. It is an account with no pretense to conclusion or permanence but one that aims for an open-ended reflection on climatic transition with the purpose of calling attention to the multiplicity of temporal conditions through which change unfolds.

This introductory chapter has introduced the Florida Keys as a field site and outlined the scope of the research through a discussion of the archipelago's infrastructural challenges in the face of rising seas and increased hurricane activity. It described how the thesis sets out to understand the temporalities of climatic events and the way these events materialize as conceptual islands in archipelagic relation, setting the stage for an exploration of hurricanes and sea level rise as resonating events through which climate change can be understood as a transitional and processual phenomenon. The following chapter, entitled 'Theorizing transition', provides a review of literature and a theoretical foundation for the project, situating it amidst geographical work addressing the transitional character of climate change, the significance of affective encounters and the challenge of engaging the future as an empirical resource. Climate, apprehended through weather and its changes, is established as emerging through the interaction of various things—objects, atmospheres, humans and others—that create temporalities through their material resonance. The chapter also introduces the concept of *liminality* as a frame through which climate change can be understood as a dynamic process and a relational phenomenon. The following chapter, 'Methods, interrupted', then outlines the fieldwork process and methods used, drawing on the constant 'interruption' inherent to motherhood (Baraitser, 2009) to propose an event-centered methodology that takes advantage of often-involuntary breaks in activity, thought and research to locate the generative in moments of transition. It considers the importance of temporal nonlinearity in fieldwork and uses blurry pictures of my children to theorize how it may be productive to *foreground* change rather than create

realities to be held “steady for a moment against a background of flux and indeterminacy” (Law, 2004: 10).

The first empirical chapter, ‘Germinating futures’ considers the ways hurricanes are complicating sea level rise in the Florida Keys. It explores how futures exist as germinating potential in a state of preacceleration (Manning, 2009), always taking on form and expression much like the pre-germinated propagule seeds responsible for the extensive mangrove colonies of coastal Florida. It considers the rhythms and refrains that compose the events of sea level rise and hurricanes and theorizes where and how to situate the future in relation to climatic events, suggesting that the idea of the future, and the presence or absence of environmental catastrophe, is more a “degree of our *attention to life*” (Bergson, 1991: 14, original emphasis). Sea level rise is profoundly germinal, unfolding in the present through experiences and representations, which are not just abstractions in space but also refrains in time, inhabited by affect. Chapter four, ‘Tracking the storm’, tracks hurricanes through the atmosphere, here conceived as both a physical medium and an affective milieu. Using Deleuze’s (1993) idea of Baroque folding as suggestive of infinite extension, it follows a number of hurricanes as they unfold, in torsion, along these dual trajectories. A hurricane is thus an event that can be tracked both externally and internally, through an atmosphere understood as one and the same generative environment in extension in two directions. It looks at the way storms are anticipated, experienced and responded to both scientifically and subjectively as they develop as scattered thunderstorms over the Atlantic, gaining strength, generating anticipation, destroying communities, dissipating over land, and continuing to affect the lives of those in devastated areas for years to come.

Chapter five, ‘Signifying the present’, concerns itself with Spinoza’s concept of ethics, exploring how we manage the idea of change in the passing present. It follows Chris Bergh, the Director of the Nature Conservancy in the Florida Keys as he engages

with local political processes to raise awareness about sea level rise and urge the government to enact effective mitigation and preparation measures. It proposes the future and the past as *atmospheric*, forming an atmosphere of signification around, and emerging from, the enduring present and explores the way Chris and other activists are gradually re-signifying the Keys' present, creating visible signs and inscriptions that actualize sea level rise as a local as well as global issue.

The final empirical chapter, 'Memorial persistence', explores Hurricane Irene (2011) through the use of Guattari's concept of 'ecosophy', which is an "ethico-political articulation" (2000: 28) that understands subjectivity as a collective effort between humans and the natural environment. It approaches the hurricane as an event that is both inexpressible and limitless so that efforts to respond to the storm must be *ethical* in the sense that they avail themselves of the storm's virtuality rather than simply attempt to explain its circumstances. The chapter unfolds as a semi-poetic experiment using refrains and aims to produce an experience as much as an analysis, to *create* the world rather than simply account for it. Refrains provide a way to think through natural disasters not as static events but as abstract machines both altering the parameters of subjectivity and continuing on as limitless agents of expression. Finally, the concluding chapter revisits the unique and dynamic mangrove, proposing it as a distinctly geographical "image of thought" (Deleuze, 2001) in the same way Deleuze and Guattari use the rhizome to illustrate the concept of becoming. It explores how mangroves develop along the shoreline in the space between land and water and also possess a distinct ability to emerge in unforeseen places through their unusual reproductive strategy. It revisits the concept of liminality introduced in Chapter Two to explore how the global climate is profoundly transitional. Climate change itself is emphasized as ongoing, shifting and accumulating, a phenomenon composed of materials in flux and harboring the pre-germinal potential for the unexpected.



**Figure 5.** 1940 postcard of the Overseas Highway [Curt Teich and Co., Inc.]

*The Secret Sits*

We dance round in a ring and suppose,  
But the Secret sits in the middle and  
knows

- Robert Frost (2002)

## Chapter One: Theorizing transition

### Weathering the climate

The 'climate' itself is much more than models and predictions suggest: it is a word referring at once to a wide and generalized trend as well as to the subjective and localized experience of the weather we encounter in our daily lives. As Hulme et al explain, "Climate can neither be experienced directly by our senses, nor measured indirectly by our instruments. Unlike the wind which we feel on our face or a raindrop that wets our hair, climate is a constructed idea" (2009: 197). The vastness and complexity of the climate makes it an unwieldy focus for casual conversation and theory alike, and in this thesis, much like in our daily lives, extreme weather events provide an entry point through which to engage with the alarming changes we are currently observing in the global climate, calling attention to the way climatic events are intruding into our existence and altering our lived temporalities. As Morton explains, climate change can "be detected as a ghostly spectrality that comes in and out of phase with normalized human spacetime" (2013: 169), describing it as a 'hyperobject', a category of thing so immense and of such incomprehensible time scale that it "humiliate[s] the human, decisively decentering us from a place of pampered privilege in the scheme of things" (2013: 47). If climate change can never be experienced as an empirical whole, weather provides at once a more manageable and more visceral approach, and though Morton describes weather as a "false immediacy" (2013: 103) compared to the immensity of the climate there remains a critical and undeniable truth to our experiential encounters with the atmosphere as it shifts significantly in temperature and turbulence. Weather is a medium in which we live and through which we move, so that we "dwell within a weather-world in which every being is destined to combine wind, rain, sunshine, and earth in the continuation of its

own existence" (Ingold 2007: S20). This weather world comprises forces, agencies and logics beyond our comprehension or control, and approaching the climate through hurricane events allows some deliberate if necessarily tentative purchase for attending to the "deep shuddering of temporality" (Morton 2013: 16) that occurs when we encounter a hyperobject. The aims of this project in response to this uncanny temporality are therefore twofold. Firstly, this research addresses the ongoing and radical problem presented by the idea of change itself, exploring the subjective and affective currents set in motion as weather provokes change in innumerable forms. Secondly, it explores how the effects of climate change are interrupting and unsettling existing temporal rhythms so that materialities, both human and nonhuman, are changing in response. This chapter provides a theoretical foundation to this project, situating it within work in geography and beyond that grapples with transitional times and spaces as well as the experience of being in and with the climate. The overarching goal of this review of literature is to introduce the concept of 'liminality' which figures heavily in this thesis as it describes the ever-changing and transitional present which emerges somewhere between a past conceived as climatically stable and a future in which significant changes are expected to manifest.

Indeed, historical and cultural geographies of the environment provide much evidence for the value of a specified approach to weather for addressing our nebulous future. Naylor (2006) cites the growing body of work that explores the vernacular experience of weather, which is simultaneously "not just local and particular, but not easily universal and generalizable either" (Naylor, 2007: 7). For example, Endfield's (2007) work on historical flooding and droughts in Mexico explores the ways these events explain broader societal changes such as indigenous revolt and epidemic disease while also anticipating the ways the region might be impacted by future climatic events (see also Endfield and Tejedo, 2006). Historical accounts of weather

must, however, be considered in a pre-standardised context in which, prior to the 19<sup>th</sup> century, weather observation was “a largely sensory/aesthetic experience, philosophical endeavour or, more latterly, a literary enterprise” (Hulme et al, 2009: 197). Correspondingly, Veale et al’s account of the Helm wind in the early 19<sup>th</sup> century North Pennines reveals that “accounts of regional weather melded common, local wisdom and expert testimony; descriptions of extreme events existed alongside everyday weather; and the atmosphere was recorded using both quantitative data and Romantic prose” (2014: 29). Similarly, Foxhall’s account of mid-19<sup>th</sup> century travelers passing through the tropical Atlantic shows that ship passengers “drew on an extensive repertoire of cultural, geographical, colonial, and medical knowledge to understand, interpret, and process their tropical encounter” (2010: 100). In the context of the 20<sup>th</sup> century’s increasing modeling and statistical analysis, Endfield examines the work of British folk meteorologist Gordon Manley who sought to amend the “decoupling” of the “climate and its cultural significance” (2011: 161). Daniels and Endfield stress the value of these historical geographies of weather in “propos[ing] powerful imaginative worlds in the form of past scenarios as well as future prospects” (2009: 215; see also Yusoff and Gabrys, 2011). Thus, weather and the climate are not just statistics and measurements mapped across Euclidian space but also *speculative materialities* emerging in relation to future scenarios as well as in the stories we tell ourselves about our own lives and worlds. Weather and climate, in other words, continuously create new and novel spacetimes.

Therefore, in the context of present day macro-narratives of climate change, a growing number of cultural geographers are exploring the way vernacular climate knowledge can be used for conceptual as well as policy purposes. This impulse is summed up through Livingstone’s call for expanded epistemologies of climate change by which we must “problematize knowledge claims” to question the dominance of

science and policy macro-narratives, “particularize experience” so that human interaction with the weather informs greater narratives, and “pluralise meaning” so that “climate is not circumscribed by any single meaning” (2012: 93). In contrast to this approach emphasizing climatic multiplicities, Hamblyn draws attention to the ways that the history of the understanding of climate change follows a narrative comprising “Key moments of disclosure and revelation, such as the publication of Charles Keeling’s saw-toothed graph, or James Hansen’s appearance before the United States Senate” (2009: 224). The macro-history of climate change is inhabited by individual humans-as-whistleblowers and animals or objects as canaries-in-coalmines so that the narrative connects lone voices “presented in emotive isolation from their ecological contexts” (2009: 231). Public environmental communication deploys these isolated perspectives at the expense of stories depicting climate change as woven into the fabric of individual lives. On the other hand, Daniels and Endfield cite “the cumulative power of apparently minor anecdotes, from an account of an Inuit adjusting his daily hunting routine to garden talk about British butterflies, synedochal stories about fellow humans figuring out impersonal forces in familiar places” (2009: 217; see also Daniels and Veale, 2014). These stories can add up to form and inform larger, more dominant narratives but also, and following Bravo’s work with indigenous communities in Northern Canada, make the issue itself more relevant in a local context particularly when local concerns are more caught up in housing and employment issues than in the more nebulous prospect of climate change (see also Farbotko, 2010). These narratives, then, might help those who frame climate change policy at a regional level to “demonstrate its relevance to these other priorities rather than to ascribe local meanings to ecosystem resilience” (Bravo 2009, 277). Similarly, Lejano et al cite the value of local stories and conversation in reifying climate change itself, allowing people to work climate into their autobiographical accounts so that “in the process of narration,

ecology and climate become not separate from our everyday lives but salient, emplotted into our personal stories” (2013: 68). In their study of drought among Australian wheat farming households, Head et al found that even during times of extreme drought “climate change is not expressed or experienced separately from anything else” (2011: 1104) and individual “belief” in the occurrence of climate change is irrelevant to the ways people mediate its effects in their lives (see also de Vet, 2013). In other words, it is more through mundane and ordinary interactions with the weather that climate change works its way into the fabric of our worlds than through accounts, warnings or illustrations put forth by the media and larger institutions.

Tangential to these experiential studies of climate and weather are those political ecology approaches that address natural disasters, or what Pawson asserts should more accurately be described as “environmental hazards” (2011: 146). Extreme weather cannot be divorced from its social and political context in that, “We may not cause earthquakes, floods and bushfires, but we are both implicated and complicit in the devastating results” (Pawson 2011, 146). Moreover, technological approaches to these hazards might actually increase vulnerability, particular for poor and marginalized groups (see Pelling 2001), a phenomenon particularly evident after Hurricane Katrina during which the complex levee system protecting New Orleans was breached, flooding the most impoverished and under-served areas of the city. Hurricanes, from this perspective, are the outcome of political, economic and social factors, raising “a more fundamental set of questions about the role of the state, and of markets, in producing ‘natural’ disasters” (Bakker, 2005: 798). Furthermore, in defining the problems and outlining potential solutions to climate disasters, expert knowledges and discourses often overlook the situated knowledges that can provide local and more relevant “counter-discourses” (Peet et al, 2011: 10). Following Lane et al’s work on flooding, environmental hazards alter existing assemblages made up of multiple human

and nonhuman actors, making it important to be aware of the way small but salient moments “might have the property to change crucial connections [and]...impact significantly on the sensitivity of the assemblage” (2013: 332). The localized experience of weather, therefore, matters quite a bit, and not just in the ways we gradually come to understand the climate as changing. Extreme weather events and their repercussions can incite subtle or sudden change in complex human-nonhuman systems that can in turn influence responses on structural and policy levels, impacting a location and its inhabitants well into the future.

This thesis considers localized weather on an experiential level, as the climate *affects* us subjectively, similar to Vaninni et al’s assertion that “we act toward the weather much like we do toward other people and other inanimate objects—in agentic ways. As the weather moves, we move” (2012: 377). However, this is a post-phenomenological study, following the trajectories laid out by Ash and Simpson (2016), for its concern for the independent agency of storms, the atmosphere, climate change itself and other nonhuman actors. It aims not to oppose global systems to the vernacular experience of weather and climate, but rather, taking a cue from the object-oriented philosophers, view these things as *composing* each other; as mutually constituted to the point that each individual thing cannot be reduced to a singular object. Therefore, in describing a dispersed field of disturbance that is periodically observable, recordable or sensible across much of the earth, the term ‘climate change’ itself is somewhat problematic in that it fails to capture the dynamic, contingent and continuously composed nature of this change, still conceptualizing it as largely singular when, in reality, it exhibits diverse physical effects across the globe that will never manage to exhaust the singular object of climate change. Previously, the term ‘global warming’ was preferred, but has since been deemed inadequate largely because the effects of an overall increase in global temperature results in extreme cold weather as

well as extreme heat. 'Climate change' more accurately conveys these extensive changes while acknowledging that they may not be uniform or simultaneous. The term 'global environmental change' has also been gaining traction recently as a more realistic description that accounts for the multifaceted ways in which these changes are playing out. Within geography, specifically, Leyshon and Geoghegan have proposed the term 'climate and the ways it might change', which they deem "a more open and inclusive formulation... that allows different ways of knowing to play a legitimate part in framing our personal, social and institutional responses" (2012: 57). This is a compelling argument, particularly as it insists on taking into account localized and subjective knowledges, yet wordy descriptions tend to feel clunky and less useful though they may be more inclusive. Morton calls for a return to the use of 'global warming' because, he explains, "On the terrain of media and the sociopolitical realm, the phrase *climate change* has been such a failure that one is tempted to see the term itself as a kind of denial, a reaction to the radical trauma of unprecedented global warming" (2013: 8, original emphasis). While I don't quite disagree, I also don't find this argument compelling enough to follow his lead. Coming from a place that experiences cold, snowy winters in a country where a vocal subset of the population denies any human role in climate change, the idea of 'global warming' continues to be an object of public derision with each record-breaking snow fall or untimely storm.<sup>2</sup> Therefore, because "our relationship to the disaster is presently more intimate than our power to represent it" (Yusoff 2009: 17), I take the position that there continue to be only inadequate terms and that 'climate change' has enough traction to be useful, even while it has obvious limitations as a descriptor.

Much like these contested terms, climate change itself is a phenomenon-in-process that inhabits a hypothetical future more than a present reality, or, as Morton

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<sup>2</sup> For example, as recently as January 2010, Vermont received a record breaking 33.1 inches of continuous snowfall (noaa.gov).

explains, “Hyperobjects are messages in bottles from the future” (2013: 138), through which our continued existence on the planet is called into question. Climate change appears throughout this thesis as neither a graspable condition nor a monolithic fact; it is at once a “demonic” (Morton 2013: 29) nonhuman agent, a concept constructed through science and policy (Demeritt, 2001) and a felt experience, “simultaneously a reality, an agenda, a problem and a context” (Brace and Geoghegan, 2010: 285). Nonetheless, the Florida Keys, where weather is urgently felt and the effects of rising temperatures can be readily observed, provide a constructive space in which to begin to apprehend the futurity of climate change as water creeps up through sewer grates at high tides, flood insurance becomes prohibitively expensive for homeowners and more powerful hurricanes threaten the islands. The Keys are suspended in an “interval of uncertainty” (DeSilvey, 2012: 36) in which impending doom mingles with the rhythms and realities of the everyday. Climate change is therefore not a fixed or stabilized occurrence, but rather a transition, an *in-between-ness* that cannot yet be attributed a definite form. Hulme (2008) suggests that human geography, with its interest in relations across space and time, is ideally suited to the challenge of apprehending the often-elusive qualities of a changing climate (see also J. Lorimer, 2012; Johnson and Morehouse, 2014; Greenhough et al 2005; Head and Gibson 2012). This research responds to and supplements work on the shifting nature, coherence and progression of this dispersed event, contributing to the growing effort to comprehend it not only as locally experienced (for example Farbotko, 2010; Connell, 2003; Hastrup, 2009; Buys et al, 2012), but also as a condition of transforming relationships affecting a place, its residents and its materials that complicates any neat division between the local and the global as categories of reference (for example Geoghegan and Leyshon, 2012; Leyshon and Geoghegan, 2012; DeSilvey, 2012). As shorelines are altered, temperatures perceptibly change and weather causes

unprecedented disturbances across the globe, the only thing clear about climate change is that it is profoundly *transitional*, connecting epochs, science and society, and disparate locations. It is difficult to situate, in other words, because it involves *change*: it is a term describing a condition that is inherently unstable.

### **Between nature and society**

We are living within what is widely regarded as a new geological epoch known as the Anthropocene, an age of overwhelming human influence in which we are understood to have enacted widespread environmental change on a planetary scale. While still an informal identification, the Anthropocene nonetheless “designates humans as a collective being capable of geomorphic force” (Yusoff, 2013: 779) and provides a way for us to locate ourselves within the planet’s ongoing physical changes extending through millions of years of tectonic shifts, ice ages and fluctuating sea levels, while simultaneously acknowledging our role in causing those changes so that it “folds geologic time into human corporeality” (Yusoff, 2013: 781). No longer are we simply subject to the power of the natural environment around us, having become instead precipitators of its abrupt change, an awareness that heralds “the public death of the modern understanding of Nature” (J. Lorimer, 2012: 606). At its most basic level, responding to climate change therefore requires a consideration of this complex relationship between humans and ‘Nature’, questioning the well-established dichotomy that prevents us from being able to “embrace the full continuum of a natural landscape that is also cultural” (Cronon, 1996: 24). The idea of a nature independent from human involvement has “stopped working” (Bingham and Hinchliffe, 2008) in the sense that it no longer provides a stable ground on which to establish scientific facts and settle knowledge-based conflicts, providing instead an “increasingly weak myth by which to govern affairs in practice” (Hinchliffe, 2008: 83). Instead of an epistemology grounded in an objective Nature, the ways we come to know our environment are increasingly

understood to be affective and contingent so that the concept of climate emerges as much through localized entanglements as global trends.

Our complex involvement with the environment has been addressed through a number of theories that identify 'nature' as a broad amalgam of things and forces, inclusive of humans, that act in combination and in opposition to continuously reshape our environment. As an event that complicates the perceived dichotomy between nature and society, the concept of climate change therefore exists within what Latour (2005) terms an 'actor network' that includes and acknowledges the activities of both humans and nonhumans rather than existing as the outcome of a 'society' that is limited exclusively to human interests and enrollment. Climate change, as a global issue, can be understood as what he has called a 'matter of concern': it is an issue that has made itself known, but it is still open to question and debate and therefore remains a more hybrid and networked political force than a fixed and unquestioned 'matter of fact'. Climate change, in other words, is a continually negotiated conception, and, most importantly, one that legitimately involves the agency of nonhumans in its creation and reshaping. This nonhuman political presence can be understood through a co-fabrication of knowledge that Isabelle Stengers has termed 'cosmopolitics', which emphasizes "multiplicities, disparate causalities, and unintentional creation of meaning" (2010: 34) rather than fixed systems by which such a transformation can conspicuously and predictably occur. Both following and in parallel with these theories, which are grounded in science and technology studies, a number of diverse materialist critiques have emerged also seeking to eschew anthropocentrism. Recently, a number of these have been broadly grouped as 'new materialisms' (see Coole and Frost, 2010; Dolphijn and van der Tuin, 2012), a category that brings together the work of Jane Bennett, William Connelly, Elizabeth Grosz, Rosi Braidotti, Sarah Ahmed as well as a number of other philosophers, many of whom have been influenced by the

work of Latour as it traces power through the movements of human and nonhuman actors. In each of these approaches, animals, humans, 'things' and forces mutually affect each other in a changing and dynamic context with ontological status shifting and distributed in various ways. Following Frost (2016), I'm choosing to broadly separate these assemblage-based approaches from the speculative realist or object-oriented approaches that, according to Shaviro (2014), tend to overly privilege epistemology and which I will address in greater detail later in this chapter. Yet all of these efforts to destabilize anthropocentrism offer, according to Frost, "a gestalt" in the face of climate change that helps us "to move past feelings of futility and fatalism and to discern how our remediating political efforts might be effective" (2016: 179) in the face of a drastically changing world.

Of these materialist approaches, most relevant to my own work is Jane Bennett's 'vital materialism', which uses the idea of enchantment to explore "the capacity of things—edibles, commodities, storms, metals—not only to impede or block the will and designs of humans but also to act as quasi agents or forces with trajectories, propensities, or tendencies of their own" (2010: viii). Bennett's work has been widely taken up by geographers who employ her version of assemblage thinking within the context of geography's 'relational turn' (see Anderson et al, 2012 for discussion)<sup>3</sup>. Of importance here is the body of work known as 'posthumanist' or more accurately 'more-than-human' (Whatmore, 2002) geography, which posits that nature and society are "co-produced" (Hinchliffe, 2008) through complex relations between multiple and diverse actors, with the human is de-emphasized if not removed from the picture entirely. These efforts call attention to the multiplicity of natures that result from a combined effort "between more-than-human bodies and a lively earth" (Whatmore,

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<sup>3</sup> And for a mere sampling of geographic work influenced by Bennett, see: Edensor 2013, Dewsbury 2014, 2007, 2003, Anderson 2009, 2004, Harrison 2011, J. Lorimer 2007, 2012, Whatmore 2006, 2009, 2013.

2006: 603) and through which the global environment and its changing climate can be conceptualized as neither exclusively natural nor exclusively human. Instead, processes involving multiple and dynamic actors possessing varied and shifting agencies produce contingent and lively 'natures' that emerge, entangle with and alter each other. Climate change, then, is co-produced, dispersed and ever-changing, part of our complex and ongoing "multinatural condition" (J. Lorimer, 2012: 601). In addition to important more-than-human work on wildlife conservation and animal geographies (for example: Hinchcliffe, 2008; J. Lorimer 2008, 2010; H. Lorimer, 2006, 2010; Yusoff, 2012; Roe, 2010; Davies, 2012), geographers have approached the nature-society dichotomy through an emphasis on the ways agency is revealed through complex human-nonhuman relationships in the context of environmental hazards and knowledge controversies of all kinds, including food scares (for example Roe, 2006; Stassart and Whatmore, 2003; Whatmore, 2002); flooding (Whatmore, 2013; Whatmore and Landstrom, 2011; Lane et al 2011, 2013), the 2004 Asian tsunami (Greenhough et al, 2005; Lehman, 2014; Clark 2011), and the 2011 Christchurch earthquake (Wilson, 2013; Hutcheson, 2013). This work seeks to affirm "a lively and volatile world that refuses the most persistent efforts to be obstinately categorized as either human or physical" (Greenhough et al 2005, 369) and explores the way these events might open spaces for thought and action. Particularly useful to my own work has been those studies that explore the relationalities of the ocean (Peters, 2012; Bear, 2014; Steinberg, 2013), and the dynamics of the coastline (Lehman, 2014; Jones, 2010, 2011; J. Anderson, 2014). The mobile properties of the ocean provide a rich material basis for theorizing change, not only via their metaphoric import but in terms of our relationship to the environment as the ocean works in concert with the atmosphere to produce the unsettled weather that we are increasingly experiencing.

Finally, this thesis draws most heavily on geographical work broadly defined as 'non-representational' to explore the varying, continuously unfolding and situated temporalities of the changing climate. Based largely on the work of Nigel Thrift (for example, 2008) this work is characterized by an effort to "draw attention to the vitality inherent with diverse material forms that often exceeds and even disrupts the spaces and concerns of human interest" (Greenhough, 2010: 38). Nonrepresentational theories attend to questions of affect, seeking to move beyond the nature-society divide by exploring the pre-personal experiences through which we are connected to the world around us, a world in which "things matter not because of how they are represented but because they have qualities, rhythms, forces, relations, and movements" (Stewart, 2011: 445). Massumi (2002) defines affect as an intensity that takes place a half second before a reaction and before the affect itself is qualified and transformed into a feeling or emotion. Affect is not the feeling itself, but rather the power that *makes* us feel, a power through which the nonhuman world can influence humans to move in ways that are at once surprising and subtle. It exists in the spaces between things, in the transition between human and 'nature', Holocene and Anthropocene, ocean and land, and subject and world, where relationships between apparently stable forms are being "ceaselessly renegotiated" (Latour, 2005: 66). Affect describes this principle of connection between humans and 'Nature' through which we can be unintentionally drawn into the world and its ever-changing forms, inclusive of the climate. This thesis takes particular interest in those nonrepresentational approaches that deal broadly with atmospheres (McCormack, 2008, 2009, 2010a, 2010b, 2014; Adey, 2011; Anderson, 2009; Adey and Anderson, 2011) and also resonates with work that explores the more subjective experience of being in and with the environment as landscape, employing a narrative structure to make visible some of the complex and varied relationships therein (for example H. Lorimer, 2006, 2010; Lorimer and Wylie, 2010; Wylie, 2005, 2002;

DeSilvey, 2007, 2010, 2012). By contributing to a growing body of work through which “Thought is placed in action and action is placed in the world” (Anderson and Harrison, 2010: 11) this research explores the situated, entangled and affective dimensions of climatic events as they resonate through the “nonlinear” (J. Lorimer, 2105: 4) spacetimes of the Anthropocene.

### **Temporalities**

This thesis engages with two related but temporally divergent climatic phenomena: the prolonged event of sea level rise and the more surprising but also more regular event of a hurricane. Time, in the context of an uncertain climatic future, can be understood by way of these two events, around and through which *futures* inhere and materialize. The event, as a concept, has been used in different contexts to describe a dispersed field of anticipation and material effects (for example: Anderson 2010a, 2010b, 2011), a nexus of affective potential (McCormack, 2003) and as utter surprise, an unspeakable and unrepresentable occurrence (Derrida, 2007; Guattari, 1995). Most importantly, events are, following Whitehead, the ultimate substance of ‘nature’ so that “space and time in themselves are abstractions from events” (2004: 78); even apparently singular objects can be understood as an individuated creative *processes* which change over time. Events are apprehended in this thesis through the idea of refrains (Guattari, 1995: 2000) that structure our comprehension and experience of the world. Whether these resonances are constituted by an echoing history of hurricanes, the changing reach of high tides, or the gradual disappearance of a once abundant species, events emerge through a “bundle of rhythms, different but in tune” (Lefebvre, 2004: 20). Lefebvre advocates the use of rhythm as a tool for analysis, suggesting an embodied methodology as a way to apprehend changing patterns and echoing Bachelard’s insistence that “Exceptional events must find resonance in us if they are to mark us deeply” (2000: 21). Through a consideration of the ways

temporality is materially resonant in and around climatic events, this project attempts to understand the rhythms of catastrophe and disappearance through which climate and its changes materialize and the way these rhythms are apprehended by humans. According to Clark, disasters create an opening in which we are “caught up in the machinations of the event” (2011: 58), and so through the opening provided by the issue of sea level rise in the Florida Keys, catastrophe is drawn out in resonance with the unexpected hurricanes that have marked this project deeply. Events appear throughout the thesis as discernable alterations in rhythmic continuity, understood as interruptions or displacements in what Massey describes as the “simultaneity of stories-so-far” (Massey 2005: 9) that constitute space. She describes, for example, a railway that passes next to the ruins of a castle, a scene illustrating two trajectories through which the “horizontalness of space is a product of a multitude of histories whose resonances are still there” (Massey, 2005: 118). Multiple narratives with distinct stories-so-far, therefore, become relationally entangled in a single context as part of an ongoing and open process. Morton’s “deep shuddering of temporality” (2013: 16), in other words, can be observed in the landscape in scenarios such as those in the Florida Keys that I explore in greater detail in Chapter Three in which salt water can be seen creeping up through the ground at high tide amidst the ongoing trajectories of everyday life: a story of sea level rise coexisting with a story of continued and indefinite life in the Keys.



**Figure 6.** Ocean water seeps up through the ground during high tide on Big Pine Key [photo: Alison Higgins 2009]

Massey's concept of space, however, presents certain challenges, not least in that it posits space as a stable element on and through which temporal trajectories unfold. The climatic elements that I consider here move, form and dissolve on the ocean and in the atmosphere, two 'media', according to Ingold (2007), in which bodies encounter and affect each other and through which stories-so-far literally have no ground for purchase. Hurricanes develop intensely powerful winds that propel them through the atmosphere and across the ocean, and although they can cause extensive damage on land the storms themselves dissipate in a matter of days, leaving no distinct trajectory despite having made a considerable impact. On water as in air, visible trajectories disappear almost as soon as they are formed, becoming effectively indiscernible. Another challenge is that spatiality, as presented by Massey, "is always an outcome of activity" (Harrison, 2007: 9), and doesn't address either the ability of events and their trajectories to assume a latent state or the extreme vulnerability that is often intrinsic to catastrophes for human and nonhuman populations alike. This thesis deals in part with events and narratives that have been dormant for many years in physical space as much as in human imagination and emerge later on, in unforeseen resonance, with little or no obvious preexisting trajectory. For example, I write about a largely forgotten hurricane that devastated the northeastern U.S. in 1938, a storm that

took on a new significance after Hurricane Irene similarly affected the region in 2011. Likewise, the suffering experienced in the wake of catastrophe generates a condition of radical inactivity that renders space passive and afflicted rather than active and advancing (see Harrison, 2007). This conception of space, in other words, does little to account for the ungraspable and incorporeal events that Deleuze and Guattari (1987) refer to as haecceities. The vast ocean-atmosphere system that generates the climate is characterized by patterns of movement, turbulent rhythms and uncanny quietude that play out through currents, cycles, disruptions and pauses. Spacetimes in the context of water and air are mobile and immersive, more so than on land, giving rise to rhythms of drift, latency and accrual, which I address in greater detail in the concluding chapter of this thesis.

It's therefore more useful to understand spacetimes as emerging from the activities and agencies of things. According to Morton, "Time is an aesthetic appearance that flows out of a thing" (2014: 272) and as disparate things coexist, blend and repel each other in various ways they generate temporalities through their rhythms of interaction. Morton describes an 'interobjective abyss' that "floats among objects, "between" them; though this between is not "in" spacetime—it *is* spacetime" (2013: 81). When things interact in novel or divergent ways, movement is generated which contributes to this abyss and when this movement is significant or otherwise apparent we understand a new event to have occurred or an existing event to have changed. As such, events never appear as concrete and cohesive wholes, but rather distributed spaces entangled with materials, forces and meanings. Bryant identifies a "molten core of objects" (2011: 273) whereby no thing exists in itself but is rather included in "systems of activity" (2011: 273), the movement of which gives shape to the thing. It is therefore through their rhythmic incongruity that events, as both individual things and systems of things, *make* time. This resonates with ideas put forward by Bergson and

Deleuze in which time is conceived as a durational field of temporal difference rather than a spatialized line of discrete moments extending in two directions. The past and future are not just mutually implicated but are composed of the same material as the present, which is “situated between the matter which influences it and that on which it has influence” (Bergson, 1991: 138). In this way the present can be considered a ‘becoming’, a condition of movement in a greater ontology of time that can be apprehended through what DeSilvey calls ‘anticipatory history’, which involves “drawing connections between past dynamism and future process” (2012: 34). The rhythms we are accustomed to in consideration with the changes we expect reveal a present in which things are beginning to time each other differently with regard to the climate.

It is the unknowable aspects of climate change that complicate our understandings of spacetime and while the phenomenon is generally understood as affecting a singular future, it is more productive to consider multiple, unsettled and mutually composed *futures*, following recent work that includes explorations of the ways particular futures are enacted as threats (Anderson, 2010a, 2010b; see also Massumi, 2005, 2007), of expectations and the promises of science and technology (Brown, 2005, 2003; Brown and Michael, 2003; Weszkalnys, 2008), and of futures manifesting in the tensions between policies, management and scientific analysis (Lane et al, 2011). Futures have also been understood to inhabit a space of excess (Yusoff, 2009; see also 2010, 2012; Yusoff and Gabrys 2011), at the edges where climate science ends and the lived reality of catastrophe begins. In these treatments, futures exist as a resonance of expectations, measurements, materials and experience, a field of dynamic and continuous transformation. If futures are considered both plural and profoundly relational, they emerge firstly as materially generative through events, and secondly as inseparable from time’s two other facets: the past and the present, whose

“implication and interpenetration... depend on our minds to bring them forth, activate them into existence” (Adam, 2004: 313-314). The goal in this thesis is less to *comprehend* the future and more to complicate the perceived linear trajectories of time through an exploration of varied and changing temporalities from which climatic futures can be understood to emerge. Temporality is a material question by which things *make* time through their relations and interactions but for us it is also a phenomenon in which “specific futures have been made present through practices of calculation, performance or imagination” (Anderson, 2010a: 791). The Keys, as they begin to disappear under rising seas, offer a unique opportunity to examine “the repertoire (or hegemony) of imagined futures which is being given material influence” (Wynne, 2007: 106) as temporalities become visible, tangible and workable during this unprecedented transition.

### **A moment of poesis**

The Anthropocene, this new human-driven age, is a complex and challenging idea, not least in that geological epochs are enormous in scale, with the Pleistocene lasting 2.5 million years and the Holocene 11,700 and counting. With a growing sense that ecocide, technology, or some combination of the two may overtake the planet before we get too far into a new epoch, who or what will eventually be credited with the fossil record remains to be seen. This is what Morton alludes to when he explains how “the very large finitude of hyperobjects forces humans to coexist with a strange future, a future “without us”” (2013: 94). The question arises, then, whether it’s not the *absoluteness* of the Anthropocene, our indelible mark on the planet, that captures our imagination but rather the uncomfortable *in-between-ness* of it, in that, despite its designation, it actually “remove[s] humans from the center of their conceptual world” (Morton, 2013: 181) by foregrounding a menacing climate that once provided a more consistent background to our existence. Jamie Lorimer (2015) positions the

Anthropocene as simply a gateway concept, ushering in a more careful and co-produced Cosmocene epoch in which we move beyond despair in the face of a changing climate by “acknowledging, building, and absencing from relations with all the risky, sustaining, and endearing dimensions of the planet” (2015: 4). From the perspective of a more regenerative Cosmocene, “The Anthropocene would become a staging point, the threshold at which the planet tipped out of the Holocene before embarking upon a post-Natural epoch of multispecies flourishing with its own, perhaps less dramatic, stratigraphy” (J. Lorimer, 2015: 4). Poised on a threshold in this way, we are presented with a creative opening, an opportunity to play a role in the composition of whatever may come next.

The Anthropocene is thus a radically novel event that must in all ways be approached through *creativity*, which Whitehead (1978) proposes as the highest value and the single principle common to all things. While I will explore this idea in greater detail in the conclusion to this thesis, it is important here to begin to understand the Anthropocene as what Stewart calls a “moment of poesis” (2008: 77), a shared creative event, “a mode of production in an unfinished world” (2008: 77). A number of writers, especially in the areas of literary theory and ecocriticism, are exploring the Anthropocene as a rich opportunity for poetry in particular (for example: Bristow, 2015; Peacock, 2012; Glaser, 2014), highlighting the materiality of language and its use in attuning to nonhuman forces, powers and phenomena. While often grounded in unconsciously correlationist ideas of subjectivity, privileging human discovery and emotion, this work is nonetheless useful in conceptualizing the Anthropocene as a “compositional node” (Stewart, 2008), an opening created by an indefinite event around which things and their affects gather, accrue and take root in the tentative space of transition. Poetics, in other words, is one way in which we might *speculate* about an unexhaustible object such as climate change and is a practice well-suited to addressing

environmental futures because it so deliberately seeks to *allude* rather than describe a still nebulous phenomenon. Within a poem, according to Susanne Langer's theory of aesthetics, "A complete subjective situation is created by the things mentioned; but everything of common sense importance...is radically omitted" (1953: 215), leaving "a non-discursive symbolic form" (1953: 211). She describes her theory as transferrable to creative writing practices more broadly, and Massumi, following Langer's work, describes narrative in general as a "powerful device by which the actual discontinuity between drops of experience is passed over" in order to produce a "meta-continuity" (2011: 66). This practice of discontinuity, or radical omission, is well illustrated in the poem *Rain Towards Morning* by noted Key West writer Elizabeth Bishop, who is also regarded as an early eco-poet:

The great light cage has broken up in the air,  
freeing, I think, about a million birds  
whose wild ascending shadows will not be back,  
and all the wires come falling down.

No cage, no frightening birds; the rain  
is brightening now. The face is pale  
that tried the puzzle of their prison  
and solved it with an unexpected kiss,  
whose freckled unsuspected hands alit.

This poem is an allusion, through the metaphor of a storm, to a freckled lover radically omitted as well as, quite probably, the oppression Bishop faced as a lesbian in 1940s America that caused her to retreat to the marginal society of the Florida Keys (McCabe, 2010: 111). The poem implies rather than informs us of these critical details of the event referenced, yet it leaves its own semblance of poetic truth, a *speculation* located somewhere between the event itself, its participants and the birds, wires, prison and storm invoked in the narrative.

The idea that a poem constructs its own world in an inter-objective middle space is elaborated in Glaser's (2014) writing on ecopoetry which makes use of Winnicott's classic work on the 'transitional objects' that often accompany children as

they venture from the safety and myopia of the mother-infant dyad out into the greater environment via the movement and actions of play. This primary need, according to Winnicott, extends into adulthood, in part through cultural forms such as art and religion which likewise reconcile self and environment through an “intermediate area... in direct continuity with the play area of the small child” (1971: 13). Glaser proposes poetry itself as a sort of transitional object through which the ‘playful’ experience of reading and writing bridges the divide between human subjects and the often terrifying forces of nonhumanity at work in the “transitional space” (Winnicott, 1971) of environmental crisis. The positive connotations of the word ‘play’ may be unsuited to the threat and magnitude of climate change, but we might instead ‘speculate’ in and into the liminal space between the present and a potentially catastrophic future, by leaving the familiarity of the subject and gesturing towards the hyperobject. Thus, poetic form may be the consummate tool for conveying the inaccessibility of things, and likewise, the empirical chapters of this thesis can be understood each as a singular creative approach to the provocation of the Anthropocene, a practice which is most pronounced in Chapter Six in which I experiment with actual poetic form rather than the idea of poesis more broadly. In other words, each chapter presents a particular *semblance* of the changing climate—“by *alluding* to a thing rather than reducing it to a model contained within thought” (Harman, 2011: 152)—through a narrative speculation that aims to address the wholly incomprehensible event of climate change.

As Shaviro tells us, “at its best, speculative philosophy rather resembles speculative fiction, for it cannot do without extrapolation” (2014: 10). Through this act of extrapolation, a poem or a narrative introduces a new object—what Langer calls a “poetic fact” (1953, 223)—that both fails to capture the event referenced yet simultaneously adds to the sum-total of the event itself. It may stretch the expression of

the original event but it is ultimately a new object that can affect and be affected so that “the form is immediately given to perception, and yet it reaches beyond itself; it is a semblance but seems to be charged with reality” (Langer, 1953: 52). Langer’s idea speaks to the imperative of speculative realism, which holds that objects are epistemologically unavailable to us so that any representation of an object must be characterized by radical omission. Or, as Morton suggests in relation to poetry in particular, “Here is the poem. But the poem is not here” (2011: 53). Instead, it exists inter-objectively, “caught between worlds, in an interstitial place that makes worlds as such seem flimsy and constructed—which, of course, they are” (2011: 53). The poem, in other words, constructs its own world and, because of this quality, poetry is an increasingly employed form of realist speculation. It has been used, for example, by the Speculative Medievalisms project in its commitment to “exploring the dimensions and borders where historiography, poetics, affect, intensification, and leaping might meet” (The Petropunk Collective 2013, vii); in AnaLousie Keating’s “poet-shaman aesthetics” (2012) which she describes a “transformative intertwining of language, physiology/matter, and world” (2012: 51) and employs anti-correlationist modes of thinking based on the idea that “Indigenous peoples developed sophisticated, highly complex, object-oriented ontologies centuries ago” (2012: 64); and, most prominently, in Quentin Meillassoux’s *The Number and the Siren*, a book-length study of the numerical puzzle in Mallarmé’s poem *Un Coup de Dés Jamais N’Abolira Le Hasard*<sup>4</sup>. Perhaps also telling is that many of the speculative realist philosophers, including Steven Shaviro and Timothy Morton, have backgrounds in English literature.

Following William James’ (2003) imperative to make *transitions* as ontologically important as the things connected, we might attribute ontological importance to transitional nature of the Anthropocene by composing climate change here, in the

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<sup>4</sup> *A Throw of the Dice will Never Abolish Chance*

middle, where its effects are only beginning to make themselves known. The irrefutable but uncertain space opened up by the event of climate change materializes through creative efforts of all kinds—artistic, scientific, experiential—composed in an alarming threshold as we scramble to re-center our conceptual world in response to the temporal shock of the Anthropocene. As Stewart writes, a moment of poesis is a collective sensibility that “can't be seen as a simple repository of systemic effects imposed on an innocent world but has to be traced through the generative modalities of impulses, daydreams, ways of relating, distractions, strategies, failures, encounters, and worldings of all kinds” (2008: 72-73). The Anthropocene therefore remains a composite creation of fragmentary, open, and broadly construed poetics: unresolved with regard to nature and society, past and future, catastrophe and salvation, epoch and epoch. It is a dynamic threshold, a promise and a provocation that can only ever be creatively addressed.

### **Materialities**

The future is seen everywhere in the Florida Keys: in the drafting of environmental policy, in storm shutters on the windows of vacation homes, in the ongoing expansion of customs at the airport to accommodate an expected influx from Cuba. Ideas of materiality therefore provide a practical tool for thinking through climate, in one respect as “anticipatory objects” (Leyshon and Geoghegan, 2012) that give physical form to climate change, serving to ‘presence’ this abstract concept with their “capacity for sensing, embodying and enacting emerging futures” (2012: 243). These objects signal the arrival of particular events—encroaching sea water, increased hurricane activity, improved international relations—as futures materialized in the present, giving form to the transition between present stability and an unknown future. The Keys, and other locations dealing with the immediate effects of climate change, are continuously engaged in the production, arrangement and experience of multiple

climatic outcomes so that “The reality status of the future lies in its performative function in the present—and the way in which such real-time abstractions both reflect imagined futures and also eventually constitute them. Or not” (Brown, 2005: 351). However, objects—particularly in a Whiteheadian sense in which they might be understood as events in themselves (1978)—are not futural only in their use and creation by humans but also exude temporality through shifts in the rhythms, substances and consistencies of their environment: as hotter summers, unprecedented high tides and changes in storm activity. Futures emerge as cars rust from driving through saltwater puddles, as the ecological succession of plant species shifts and as the acidity of the ocean increases. Materialities, as they develop through the actions of humans and nonhumans alike, can therefore be understood as “precarious achievements enacted through finite alliances in a tensed world” (Anderson and Wylie, 2009: 320), existing as a relational tension *between* disparate things, a tension that often develops through properties and agencies that exceed human awareness.

This idea is critical in addressing climatic events like tropical storms and global warming itself that surprise us with their presence and force, and despite the role we have in causing climate change it remains an issue of materiality which “far exceeds any invocation of ground or physicality” (Anderson and Wylie, 2009: 319). Useful here is the work of a number of philosophers working in the loosely organized field known as speculative realism or ‘object oriented ontology’ (OOO)<sup>5</sup> who have adopted an anti-correlationist perspective by which objects are understood to be more than simply products of cognition and to matter in ways that are inconceivable from a human perspective. To these philosophers and others following their lead, it remains impossible to isolate a single object because each exists only through its differences in relation to other objects. A car, for example, is a different object to the driver for whom

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<sup>5</sup> OOO is technically a grouping within speculative realism that includes, in particular, the work of Graham Harman, Levi Bryant and Timothy Morton.

it is a convenient mode of travel and the fly trapped inside to whom it is a bewildering prison. It is a different object again in relation to the road on which it travels, the fuel that it consumes or the oxygen molecules that cause it rust. There is no position from which the car is more real so that there is never an essentialized car that can serve as concrete and universal object, or as Morton explains, “When you approach an object, more and more objects emerge” (2013: 55). Speculative realist approaches can be separated from actor-network and new materialist approaches largely in that they “differ on the extent to which the *relations between* or the *autonomy of* elements of the world is their most salient feature” (Frost 2016, 183). Harman (2005) insists that objects are ontologically prior to their relations so that each object is “withdrawn” from full access and even while it can engage in relations with other objects its essence itself is inaccessible. Jane Bennett, however, characterizes this opposition between a thing and its relations as a needless chicken-or-egg argument:

perhaps there is no need to choose between objects or their relations. Since everyday, earthly experience routinely identifies some effects as coming from individual objects and some from larger systems (or, better put, from individuations within material configurations and from the complex assemblages in which they participate), why not aim for a theory that toggles between both kinds or magnitudes of “unit”? One would then understand “objects” to be those swirls of matter, energy, and incipience that hold themselves together long enough to vie with the strivings of other objects, including the indeterminate momentum of the throbbing whole. The project, then, would be to make both objects and relations the periodic focus of theoretical attention (Bennett, 2012: 227).

She notes also that Deleuze and Guattari manage to simultaneously conceptualize groups as well as individual objects—orchids, wasps, metals, etc.—despite the fact that they are characterized as correlational systems theorists by the speculative realist philosophers. Likewise, Steven Shaviro makes effective use of Whitehead’s process philosophy modify speculative realism in order to portray things as inherently mobile, relational and ceaselessly changing and grants ontological priority to the ‘aesthetic’ register of affect rather than to isolated objects, a position I will address in greater detail later in the thesis.

However, putting arguments over the ontological status of a thing and its relations aside, it remains useful in the context of climate change to understand any object or thing as a shifting, *perspectival* middle created through multiple positionalities and restricted only by its capacities to affect or be affected, a material continuity that Bryant (2011) equates with substance itself. Materiality, I would suggest, is thus not prior to things but rather composed through their persistence, or lack thereof, amid continuous change so that “difference is an *activity*” and “existence is thought as a sort of doing or movement” (Bryant, 2011: 273) materializing in relation to the movement of other things. Morton’s ‘hyperobjects’, the foremost example of which is climate change, create a mesh of materiality with immense and inconceivable agency that, from a human perspective, causes “an inducement to reflection” (2013: 147), an uncanny sense of doom, and a flood of responsive action in the face of its complex agency. In other words, climate change, though anthropogenic, is causing a tremendous amount of unforeseen ‘difference’ in human lives, in living beings more broadly and in other forms and materials across the earth. Nonetheless, I seek to retain the idea of *subjectivity* in this thesis in order to use the human subject as a necessary site through which to approach the changing climate and through which broader ideas of materiality, rather than an orientation toward objects, allow us to “to remain attached to the question of whether the quality of relations between things matters, and not just a concern for things in and of themselves” (Baraitser, forthcoming: 8). From a human perspective, materiality is the resonance between forms and thoughts, or perhaps more accurately between forming and thinking, so that a thing is “a materialized idea embodied not so much in the perceiving or the perceived considered separately as in the between, in their felt conjunction” (Massumi, 2002: 95 ). Massumi prefers the word ‘semblance’, a conception that understands things not as transcendent forms but as affective relational arcs that resonate through and between the physical.

According to Bergson's observation, "matter goes in every direction beyond our representation of it" (1991: 181) and thus, for a thing to *matter* to humans it must be brought into affective resonance with other things, so that form is defined by its potential, by the change that happens at its edges and its involvement with other forms and other matters. In fact, as I implied in the previous section, it may be in distinguishing between subject and object that our experience of time itself emerges, as we sense, attune and align our own temporalities in resonance with the things around us and, in particular, in response to the changing climate. In other words, without allowing some difference between human-objects and other objects, we are unable to perceive the catastrophic futures emerging through our ongoing destructive relationship with the environment or how these futures are implicated in vast material configurations that exist both within and beyond us. Therefore, the best way to theorize the nonhuman may not be to silence the human but rather to foster a greater proximity to things through our particularly human expressions, to create compositional nodes as Stewart (2008) suggests, or as Bennett proposes,

word workers can best keep faith with things...if they approach language as rhetoric, as word-sounds for tuning the human body, for rendering it more susceptible to the frequencies of the material agencies inside and around it. The goal: to use words to make whatever communications already at work between vibrant bodies more audible, more detectable, more *senseable* (2012: 242).

At a time when we find ourselves, as subjects, in the midst of an Anthropocenic moment, these resonances between things may be distinctly and acutely 'senseable'. As shifting coastlines, changing temperatures and extreme weather alter the spacetimes of the world as we understand it, futures emerge and inhere through vast and varied material forms accessed through attunement and response in the space of climatic transition.

This attunement, then, returns us to the creative opening provided by the Anthropocene as a moment of poesis. Morton draws a connection between poetry and causality itself in that writing can intervene in reality and that an "OOO approach to

poetry shows how poems do something as physical as what happens when my car scrapes the sidewalk” (2012: 206). A poem, he says, is an opportunity to experience the dilation and contraction of time and is “not simply a representation, but rather a nonhuman agent” (Morton, 2012: 215). Bennett, however, suggests in her work on material sympathies in the poetry of Walt Whitman, that creative writing references an “impersonal ontological infrastructure, an undersigned system of affinities (which persist alongside antipathies) between and within bodies” (2014: 239-240). In other words, “text bodies”, as Bennett calls them, are able to gesture towards the immensity of climate change because they

can light up, by rendering human perception more acute, those bodies whose favored vehicle of affectivity is less wordy: plants, animals, blades of grass, household objects, trash...Poetry can help us feel more of the liveliness hidden in such things and reveal more of the threads of connection binding our fate to theirs (2012: 232).

The impersonal parts of ontology can therefore not only be accessed but can be creatively addressed. Writing, thus, can function as a *material* response to questions of *materiality*, but not simply in the creation of a new object or nonhuman agent but through the participation in and alteration, however minor, of existing assemblages.

## **Speculations**

Despite our efforts to theorize things as having agencies beyond the concerns of humans, it remains difficult to adequately conceptualize these agencies. Theorists of nonhumanity, as Lisa Baraitser notes, have an imaginative penchant for listing disparate objects in order to highlight various forces that operate outside of our perception or understanding:

There is something aesthetic at work in putting tar alongside canaries, in noticing rat next to cap.... that shows up a very human desire for things to be autonomous from us when perhaps they have been pre-grouped through our particular tendencies towards noticing some objects and not others. This is not to say that objects don't exist independently of us, but our desires for their autonomy may, nevertheless, be just that—our desires (forthcoming: 14)

Baraitser's contribution to OOO highlights this inherently correlational 'sifting' that occurs when we try to theorize nonhuman agency, a sifting clearly at work in my own

aesthetic grouping of cars, flies, oxygen molecules, etc. Bennett likewise questions whether we are ever capable “of transcending the provincial, pro-human-conatus perspective from which we apprehend the world” (2012: 229). The approach of the object oriented philosophers is to consider the human subject itself as one object among others in order to emphasize that an ‘object’ is not “something that is automatically apprehended by a subject” (Morton, 2013: 149). According to Morton, even “consciousness is an *aesthetic effect*” (2013: 84, original emphasis) emerging through the interaction of a vast array of objects, including a brain and nervous system, electromagnetic waves and diverse material elements. Yet this ‘aesthetic effect’ remains an unavoidable boundary between human objects and other objects, an immutable sieve created by our positions, perspectives and capacities, so that Baraitser wonders if “Perhaps these strenuous efforts to de-centre the human always bring it back” (forthcoming: 14). Moreover, the word ‘object’ continues to have unavoidably misogynistic—and therefore human-centric—connotations for those versed in feminist theory<sup>6</sup> or who may “have felt the ongoing effects of being objects in the lives of others” (Baraitser, forthcoming: 8). Particularly unhelpful in this regard is a paper by Morton entitled ‘Treating Objects Like Women: Feminist Ontology and the Question of Essence’, in which he dismantles the work of Karen Barad, which uses quantum physics to propose a singular world of entangled agencies, to explain that feminism needs to focus less on relationality and more on essentialized objects that are so inaccessible they can “exceed any gaze, any encounter at all” (Morton, 2013: 65). Despite overtures to women and continued justification of the use of ‘object’ (see also O’Rourke, 2011), erasure of the subject remains particularly uncomfortable in an academic context in which it is still challenging for women to achieve full intellectual subjectivity (see Chapter Two for further discussion). Like Bennett, I much prefer the

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<sup>6</sup> see, in particular, Nussbaum 1997.

word 'thing' which "has advantages over "object,"...if one's task is to disrupt the political parsing that yields only active (American, manly) subjects and passive objects" (2012: 231). Things, in other words, are forceful, unfinished and inaccessible but still able to generate productive and provocative materialities in concert with complex, inescapably human subjects.

While the speculative realist philosophers clearly have something to offer posthuman theory and poststructuralism more generally, their sudden arrival on the scene and unexpected dominance of the conversation has caused a stir within philosophy and beyond. In fact, there's another type of aesthetic listing that goes on in relation to speculative realism's near-mythic birth at an event at Goldsmith's College in 2007 which is repeated like a litany along with the names of its four founders, and often a second tier of largely male scholars. From Bryant et al's introduction to *The Speculative Turn*:

The original group included Ray Brassier, Iain Hamilton Grant, Harman, and Meillassoux... But while the group has already begun to break into various fragments, it remains a key rallying point for the rising generation of graduate students...The editors of this volume are pleased to have Nick Srnicek on board as a fitting representative of this group (Bryant et al, 2011: 2).

From Shaviro's *A Universe of Things*:

The name "speculative realism" was first introduced in 2007 to describe the work of four philosophers: Quentin Meillassoux, Graham Harman, Ray Brassier, and Iain Hamilton Grant. Other thinkers who might be added to the group include Levi Bryant, Ian Bogost, Timothy Morton, Eugene Thacker, and Ben Woodard (Shaviro 2014, 5)

Likewise, Levi Bryant, on his blog, described the founders of speculative realism as the "four horsemen of the philosophicus" (O'Rourke, 2011: 277); a more patriarchal image could hardly be called to mind. The phenomenon I'm trying to convey in presenting these lists is encapsulated in an essay by the novelist Claire Vaye Watkins entitled 'On Pandering', in which she explores an entire life of what she describes as "watching boys do stuff", a practice that has had a profound influence on the way she writes. As she explains:

I've watched boys play the drums, guitar, sing, watched them play football, baseball, soccer, pool, Dungeons and Dragons and Magic: The Gathering. I've watched them golf. Just the other day I watched them play a kind of sweaty, book-nerd version of basketball. I've watched them work on their trucks and work on their master's theses. I've watched boys build things: half-pipes, bookshelves, screenplays, careers. I've watched boys skateboard, snowboard, act, bike, box, paint, fight, and drink. ... I watched Melville, I watched Salinger, watched Ford, Flaubert, Díaz, Dickens, watched even when I didn't particularly like what I saw... I watched the boys, watched to learn. I wanted to write something Cormac McCarthy would like, something Thomas Pynchon would come out of hiding to endorse, something David Foster Wallace would blurb from beyond the grave (Watkins, 2015: unpaginated)

Much of her published writing, then, has been an act of pandering to the tastes and opinions of a white male literati: "*She can write like a man*, they said, by which they meant, *She can write*" (ibid.). On a personal note, I believe I've slowly learned how to avoid this type of pandering over the course of writing this thesis, and the chapters written towards the end, most obviously Chapter Two which makes a case for the generativity of motherhood in the context of academic work, directly vie with this male privilege in the academy. Nonetheless, my entire encounter with speculative realism feels like an exercise in watching boys do stuff. And this is particularly grating in a context in which women theorists have contributed so much to what might now be described, retroactively, as non-correlational thinking. To wit, Morton's description of the field and founding of speculative realism describes it as:

the umbrella term for a movement that comprises such scholars as Graham Harman, Jane Bennett, Quentin Meillassoux, Patricia Clough, Iain Hamilton Grant, Levi Bryant, Ian Bogost, Steven Shaviro, Reza Negrastani, Ray Brassier, and an emerging host of others such as Ben Woodard and Paul Ennis (Morton, 2100: 9)

Patricia Clough is a relevant inclusion here, but has of yet published little work on speculative realism and might best fit into the 'emerging' category<sup>7</sup>. On the other hand, considering both the longevity of her theorizations of nonhuman agency which significantly predate this newer impulse as well as the effort she has put into *contesting* the propositions of speculative realism, the list seems less to *include* and more to

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<sup>7</sup> Clough has engaged with speculative realism largely by hosting a 2011 conference on the topic at the City University of New York's Center for Humanities, with Jane Bennett, Levi Bryant and Graham Harman speaking, although she has forthcoming work in *Object Oriented Feminisms* (forthcoming from University of Minnesota Press) and has blogged on the topic.

*subsume* the work of the brilliant Jane Bennett<sup>8</sup>. One might wonder how she feels about being included in this list and whether or not this might be an act of appropriation on Morton's part. This dubious inclusion of women is also evident in Bryant et al's *The Speculative Turn* (2011), a volume comprising the work of twenty-three individual authors and including only *one* woman. That one woman is none other than Isabelle Stengers who, in her contribution on the import of 'sorcery' and 'wonder' as ways of knowing, fails to address speculative realism directly (or perhaps succeeds) (Stengers, 2011b)<sup>9</sup>. Most perplexing in this vein is a 2011 paper by queer theorist Michael O'Rourke entitled "'Girls Welcome!!!' Speculative Realism, Object Oriented Ontology and Queer Theory". The 'girls welcome' quote is pulled from Graham Harman's liveblogging of a metaphysics conference in 2010 in which he was replying to Donna Haraway's assertion that speculative realism is intriguing but that there are not enough women involved<sup>10</sup>. While O'Rourke makes a strong case in the paper for the relevance of speculative realist work to queer theory, his claim that "quite a few girls have (always) already accepted that invitation" (2011: 287) is not well substantiated. The paper grants a lot of weight to the fact that Donna Haraway once publicly acknowledged the existence of speculative realism, it quotes Levi Bryant at length on how we might theorize an "ontology without phallus" (quoted in O'Rourke, 2011: 295) (an approach that strangely does not include paying more attention to the work of those without phalluses), and then, at the end, assimilates the work of a number of exceptional poststructuralist thinkers, including Elizabeth Grosz, Isabelle Stengers and Jane Bennett by way of a ferris wheel analogy that Graham Harman developed in his book *Circus Philosophicus*. As far as I can tell, none of these thinkers

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<sup>8</sup> Conspicuously absent is from these lists Eileen Joy, the renegade scholar and self-described "para-academic" who is a founding member of the open-access publisher Punctum Books which has contributed substantially to the speculative realist canon.

<sup>9</sup> Likewise, the *Speculative Realism* book series published by Edinburgh University Press and edited by Graham Harman has published eight titles to date, not one of which was written by a woman (although Jane Bennett serves on the advisory board).

<sup>10</sup> It was Haraway who originally used the word 'girl' (with more than a hint of sarcasm, I like to think).

has identified herself as belong to the speculative realist impulse and, since much of their work predates the arrival of the four horsemen, they seem less to be responding to an invitation, as O'Rourke asserts, than perhaps *doing* the inviting<sup>11</sup>.

In Stengers' lone female contribution to *The Speculative Turn*, she connects the concept of materialism to Marxist struggle in that it emerges through continuous intellectual maneuvering, as "Academic bickering is usually reducible to a matter of mere rivalry for a very disputed title: who is the thinking brain of humanity?" (2011b: 369) In the context of science studies, she warns against the risk of an eliminativism in which the subjective is completely removed from conceptions of materialism and in which "Elimination has become the very tool of power" (Stengers, 2011b: 370). Her implication, although she never mentions speculative realism by name, is that anti-correlationist thought risks exactly this and she cites Haraway's *When Species Meet* as a good example of materialism that is "connected with the many struggles that are necessary against what simplifies away our worlds in terms of idealist judgments about what would ultimately matter and what does not" (Stengers, 2011b: 371). Bennett's critique is more direct and biting: she writes that "object-orientedness is (what Foucault would call) a technique of self" (2012: 230) and that "the object-oriented philosophers' *figuration* of the thing as a secret (as having a "hidden surplus") has a performative dimension. The figures of "withdrawal" and "allure" help to induce into being the aloof star of the philosophy" (2012: 232). Like Bennett, Stengers and Haraway, I see a lot of interesting thought coming out of the speculative realist impulse, but also a group of men claiming greater intellectual access to the world of the nonhuman. In other words, I would accuse the speculative realist philosophers of ignoring, as Beth Greenhough

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<sup>11</sup> It should be noted, however, that there are some promising feminist engagements with speculative realism on the horizon, including a forthcoming volume entitled *Object Oriented Feminisms*, after a 2012 conference of the same name, and edited by Katherine Behar, as well as another forthcoming volume from Punctum entitled *After the "Speculative Turn": Realism, Philosophy, and Feminism*, edited by Eileen Joy, Ben Woodard and the philosopher Katerina Kolozova.

puts it, the ways it might be necessary for researchers to entertain “questions of how our own inherent biases, our abilities to sense and relate to others, and the structures and conventions of academic labour shape the assemblages which emerge through our work” (2012: 202). Thanks to the litany of its founding narrative, the field is forever structured in such a way that women can only aspire to participate, so that we remain, as Maggie Nelson articulates perfectly, “at the feet of yet another great white man pontificating from the podium, just as we’ve done for centuries” (2015: unpaginated). Therefore, in privileging an object’s ontological purity over the systems and relations in which it is involved, speculative philosophers fail to acknowledge the way assemblages might privilege some objects over others and, therefore, ignore the fact that as men they have greater structural access to that podium.

To reiterate Stengers’ point, “materialism loses its meaning when it is separated from its relations with struggle” (2011b: 368). This struggle is over who gets to determine which materials actually matter but also refers to the struggles of those materials themselves as they interact, relate and compose each other in the creation of systems, assemblages and worlds. The intellectual contest over the terms and conditions of materiality, in other words, mirrors and is inseparable from the ongoing creative processes that Stengers puts forward in her considerations of Whitehead’s ontological principle, in which “there is no stable difference between explanation and description, but only distinctions dealing with what matters, and with the environments required by what matters” (2011a, 262). Creativity, as Whitehead’s highest value, “is not the judge of problems and opinions, but is relative to the way the problem is framed and therefore liable to change along with the problem” (Stengers, 2011a: 254). It makes little sense, then, to focus on the inaccessibility of objects, but rather on how those objects continuously *create* new worlds and thus new and novel spacetimes, so that the principle of discovery “implies, each time, a becoming that transforms both the

person doing the describing and what is described” (Stengers, 2011a: 249). This thesis uses speculative realism as a frame of sorts to conceptualize climate change, for, as Morton asserts, no single model can help us cope with its strange and vast spacetimes. Yet it simultaneously questions the monopoly this field has on ontological profundity and asserts its own version of mattering and discovery.

### **Liminal materialism**

Climate change manifests as a shifting resonance between events, materials, and futures, a phenomenon that occurs in the nebulous space between apparent forms. This space could be understood as ‘liminal’, a word describing that which is “Characterized by being on a boundary or threshold, esp. by being transitional or intermediate between two states, situations, etc.” (OED, 2015). It illustrates the critical condition of Anthropocenic *in-between-ness* that the Florida Keys find themselves in today as they exist between a past understood as stable and a future that is decidedly uncertain. As a concept, liminality has been used extensively within the field of anthropology to describe times during which individuals are in the process of traversing a space between definite cultural positions, including rites surrounding birth, marriage, puberty and death, as well as transitions involving war, famine and natural disasters. The term was first used by Arnold Van Gennep in his seminal work *The Rites of Passage*, published in 1909, which presented a radical shift in thinking with its choice to interpret rituals as dynamic, change-producing *events* rather than static building blocks of culture. Van Gennep was interested in the “magico-religious aspect of crossing frontiers” (1960: 15), choosing to explore the threshold of change, rather than rely on the interpretation of myths, terminologies and texts. Culture, for Van Gennep, was not external to the individual, but rather composed of affective encounters experienced and reinforced during the ongoing event through “the dynamics of the rite” (1960: 10). Thus a culture, much like the event of climate change itself, is not a unchanging structure to

which humans are subject but rather emerges as a dynamic field of experience created and enacted during threshold moments. Van Gennep's work was revisited in the 1960s by Victor Turner who included it as part of his "processual approach" (Thomassen, 2009: 14) to the study of cultures, emphasizing the power of rites to "effect an ontological transformation" (Turner, 1967: 102). As Turner writes, individuals involved in liminal rites "are at the very least "betwixt and between" all the recognized fixed points in space-time of structural classification" (1967: 97), in "a realm of pure possibility whence novel configurations of ideas and relations may arise" (1967: 97).

Prior to its use in anthropology, one of the earliest treatments of the idea of liminality is found in the 16<sup>th</sup> century writings of Paracelsus, a physician and occultist whose writings Jane Bennett (2001) discusses extensively in her work on material enchantment. Bennett was concerned more with Paracelsus' reading of nature as "divine prose" (2001: 33) but she touches on his description of the transitional *limbus*, which, according to Paracelsus, is the "'hem" (or "margin" or "border")" (2001: 37-38) of the spiritual realm. The limbus is where "potentiality gives way to specific, real things.... the ambiguous space of becoming" (Bennett, 2001: 37-38). In Paracelsus' own words, it is "the means or material with which spiritual, divine things become visibly, tangibly concrete" (1998: 196). It is the threshold through which things come into material existence, reflecting the way climate change is beginning to take on material form in the Florida Keys and elsewhere. The limbus is not itself a material space, but the principle of formation, the process of emergence, equivalent to the Deleuze-Guattarian edge between the actual and the virtual. It is "a term of transformation, it is the mystery of becoming in its natural form" (Weeks, 1997: 179), and the continuously changing edge at which events develop, move and change.

The idea of liminality resonates with poststructural work that seeks to dismantle binaries and critique our inclination towards concrete structures and definite forms.

Massumi identifies “an addiction to foundation and its negation” (2002: 71), a reliance on mutually exclusive dichotomies to explain and conceptualize existence. Likewise, as Deleuze and Guattari explain, dualisms are “an entirely necessary enemy, the furniture we are forever rearranging” (1987: 23) around an abundant but formless center that “is by no means an average; on the contrary, it is where things pick up speed” (1987: 25). Dualisms serve as a system for navigation, providing markers by which a middling tension can be diagrammed, creating tentative representations that “remain intensities-in-the-making, force fields for future thought” (Manning, 2009: 10). Dualism is a rhetorical tool that allows us to conceptualize change, as it occurs in the passage between apparently stable forms. It is impossible to talk about the felt and the formless without inciting form itself and Massumi advises us to treat dualism not “as a dichotomy but as a creative differential” (2011: 18). Liminality, therefore supplies a vocabulary that is not anti-dualistic, but radically dualistic in that it continuously acknowledges and employs the power of dualisms to attend to the tensions and movements arising in the middle. This threshold edge, as Paracelsus argues, gives rise to “the whole world” (quoted in Rudolph, 1998: 198). Deleuze and Guattari call this edge ‘emergence’; Massumi has called it “a fringe of unlikelihood” (2002: 91), and “a liminal realm” (ibid: 31). Morton describes the “shifting, liminal spaces” emerging from coexisting things (2014: 274). Whitehead has his own vocabulary for the in-between, which he refers to as nature’s “ragged edge,” (1978: 50), and “a wavering breadth of boundary” (1978: 69); Bergson concerns himself with “the point of contact between consciousness and things” (1991: 65); James’ radical empiricism argues that “Life is in the transitions as much as in the terms connected” (2003: 45). The concept of liminality does not operate as an abridgement or summary of all of these very individual and nuanced ideas, yet it does seek to be inclusive of the fundamental and widely-expressed need to re-conceptualize the space between forms as one of “transitional-

being" (Turner, 1967: 95), an idea that resonates today as the global climate traverses a similar threshold.

Recent work in geography has also addressed the idea of liminality, considering borders and landscapes, both physical and conceptual, and the shifting forms and meanings generated therein. Jones' work on tidal landscapes (2010: 2011) explores the idea of "margins as *affective spaces*" (2010: 190), and work in a recent volume entitled *Liminal Landscapes* explores spaces "connected to transformation and processes of becoming" (Andrews and Roberts, 2012: 7), including the edges between water and land, and the marginal spaces of cities and nations (for example Selwyn, 2012; Andrews, 2012; Roberts, 2012). More pertinent to my own work, the concept of liminality also received brief attention in a proposition made by Marcus Doel two decades ago in which he advances a 'liminal materialism' that works as "an acategorical, asignifying, and asubjective theoretical-practice" (1994: 1052). This largely deconstructionist approach outlines an ethical engagement with a materiality that identifies but "no longer invests in difference, otherness, singularity, and alterity" (1994: 1053) emphasizing "expenditure" instead of using otherness as "an apparatus of capture" (1994: 1046). According to Doel, we must traverse an edge between form and chaos in which the unwritability of existence "risks making sense" (1994: 1047), engaging in an effort of "complication, experimentation, and invention" (1994: 1051). This 'unwritability' is crucial as transitions, from a certain perspective, are too unstable to accurately represent in the form of writing. In the concluding chapter of this thesis, I link the idea of a liminal materialism to the dynamic mangrove plant which provides a metaphor through which forms can be understood to develop as open-ended clusters and accruals, an archipelagraphy of assemblages rather than a series of definitive structures. Materials, in this treatment, appear through a turbulent and often erratic

process of association and disassociation, suggesting a materiality of *thresholds* rather than *forms* and addressing the impossible middle space of emergence.

The idea of liminality provides a speculative vocabulary for describing the continuous passage that characterizes change, a vocabulary that “serves to conceptualize moments where the relationship between structure and agency is not easily resolved or even understood” (Thomassen, 2009: 5). Liminality acknowledges the in-between in the same sense as ‘becoming’, ‘emergence’, ‘passage’ and ‘duration’, it “entertains *difference* without an assumed or imposed hierarchy” (Thomassen, 2009: 27, original emphasis). Climate change is liminal in that it occupies a “space of potentiality” (Andrews and Roberts, 2012: 1), follows a ceaselessly renegotiated edge along which spacetimes are not given or transcendent but rather appear through the encounter and intermingling of diverse things. As anthropologist Bjorn Thomassen explains, “Liminality is a world of contingency where events and ideas, and “reality” itself, can be carried in different directions” (2009: 5); it is a word well-suited to acknowledging the “crossings, ‘forcings’, and meetings that occur because we inhabit a complex and shifting world of ever-changing thresholds” (Gabrys and Yusoff, 2012: 13). Liminality, rather than simply existing at the edges of forms, is the basis from which these forms are abstracted, forms “between which there are no boundaries, only dynamic thresholds” (Massumi, 2002: 38). Climate change, and the Anthropocene in which we locate it, is culturally, physically and conceptually liminal; it is a threshold condition presenting distinct but shifting materialities manifesting in the transformational fabric of lives, contexts, spacetimes.

As the shoreline creeps inland and residents gradually depart for less precarious and more affordable locations, the Florida Keys are coming to be defined by the changes occurring at their edges. Islands like the Keys embody a “nervous duality” (Baldacchino, 2005: 248) between land and sea, much like today’s climate embodies a

nervous duality between past and future. Climate change is not a clearly defined event but rather a middling *tension*, a situation in which “The essence of a thing never appears at the outset, but in the middle, in the course of its development, when its strength is assured” (Deleuze, 1986: 3). As the Keys slowly become uninhabitable and the world takes notice, the event of sea level rise grows stronger and more assured. However, this consideration of climate change is not restricted to the Florida Keys or to sea level rise alone. As addressed in greater detail in Chapter Two, my research moved into more surprising and more personal territory through two unexpected storms that occurred in the northeastern U.S. over the course of fieldwork. During a respite between research trips spent looking at how the continual threat of hurricanes complicates sea level rise in the Keys, I returned home to Vermont in time to witness my own town ripped apart by the remnants of Hurricane Irene. With the local roads destroyed, my family and I spent several days isolated without any electricity or running water; four houses in our town were completely swept away by a raging river. Thresholds, in other words, are everywhere: catastrophe is not limited to places so obviously on the edge as the Keys, as climate change becomes increasingly assured the world over with each untimely flood, drought or storm. Dealing with climate change therefore requires “practices at the threshold—or zero degrees mark—where thresholds encompass contingent relations and understandings” (Gabrys and Yusoff, 2012: 18). Liminal materialism supplies this zero degree, providing a nucleus around which to connect disappearing islands with two unexpected hurricanes in the northeastern U.S. Understanding climate change as liminal requires a certain vigilance with regard to its potential: an openness to the unplanned and unexpected, a willingness to let apparently disparate things *matter* and *move*, producing compositional nodes in the space between different kinds of apparent stabilities.

The color, the grace and levitation, the structural pattern in motion, the quick interplay of live beings, suspended like fitful lightning in a cloud, these things are the play, not words on paper, nor thoughts and ideas of an author, those shabby things snatched off basement counters at Gimbel's.

-Tennessee Williams, Afterword to *Camino Real* (2008)

## Chapter Two: Methods, interrupted



Figure 7. A blur of children [photo: author]

### Blurry pictures

I enjoy taking blurry pictures of my children: pictures with partially obscured content or smeared pixilation that more clearly illustrate a childhood composed through jumping, running, squirming, laughing, swinging. This started as a collection of unfocused shots that were either too evocative or too well-framed to delete but eventually grew into a deliberate practice in pursuit of digital impressionism. The photos create something concrete but speculative out of movement and change, catching the children for a moment mid-event in a blur that is indicative of process rather than stasis, of freedom rather than capture. They offer a tentative way to reify transition, much like this thesis which employs an *event-centered methodology* that figures its way through the prolonged phenomenon of climate change, through two surprising and transformative storms and through the distracting births of two children. These events all contributed particular temporalities to the narrative, in the sense that “Things *time* other things, to use the verb “time” transitively. They write stories on their surfaces” (Morton, 2014: 272) as they catch each other in-process. From a certain perspective, motherhood provided an ideal back drop to this work because to raise

children is to be gripped by chronic temporality, both in that they are changing so rapidly and also in that they punctuate lived time with their constant and incessant demands. Fundamentally, these chapters work as a series of resonating stories, conjectures and assertions about time and change that were cultivated at the edges of my children's blurry little lives: compiled in thirty minutes here, two months of intensive work there, seven unexpected minutes while they were distracted, sometimes a couple hours in the evening if everyone was amenable, a stretch in the middle of the night after the baby went back to sleep. This project was disrupted, relocated and interfered-with by events that storied each other within the space of research, framed here as concrete but speculative snapshots born in the blurry haze of transition.

As Sarah Manguso writes in her book *Ongoingness*, to mother is to become "the baby's continuity, a background of ongoing time for him to live against," so that as a mother, "I am no longer merely a thing living in the world; I am a world" (2015: unpaginated). Many writers, myself included, enjoy being alone. It is almost a requirement for tolerating the solitary hours needed to form thoughts, turn those thoughts into words and maneuver those words on the page. But, being now a world, I am almost never alone. I am always in the company of my children, their needs and their persistent entropy. Even when I am away I can feel them gradually unraveling, a process that will only be contained by my reappearance. As a result, fieldwork required juggling the often reluctant and uncooperative bodies that accompanied me out of necessity on my field visits. As I tried to read, tried to write and tried to think the children were constantly breaking my concentration, changing my plans and obstructing my progress. I prepared food, cleaned up messes, and played games. I lifted, shuffled, wiped, dressed, comforted, convinced and amused, and all of this just to maintain the most basic of functional continuity in our household. With full-time

childcare financially unfeasible<sup>12</sup> and under sway of the attachment theory of parenting, the loss of autonomy that accompanied motherhood has been particularly unsettling. It seems to take a very long time for a baby to leave the orbit of its mother's body and during that time we are subject to a forced myopia that is as intoxicating as it is oppressive. But this sweet, needy babyhood is actually very brief and many mothers value the *responsibility* of childcare, in the literal sense of the word, in that we want to be *able* and available to *respond* to the children's needs rather than outsource that responsibility despite—or perhaps because of—any ambition we may possess. In other words, “Care work is work. It is not self-indulgent; it is radical and necessary” (Mountz et al, forthcoming: 4) and, put simply, had I chosen to fully commit to a demanding career while my children were young they would have spent their early years experiencing a more angry and distracted mother, to their great detriment, I imagine. If I provide the background against which my children must live, then I choose for them to grow up in a relaxed world originating from a relaxed mother.

I realize that writing about my children to the extent that I am here goes against the conventional “quarantining of the feminine or the maternal from the realm of intellectual profundity” (Nelson, 2015: unpaginated). Yet birthing and raising children is so thoroughly empirical that the thesis-as-project paled in comparison to children-as-projects and it seems unnecessarily limiting to try to enforce this quarantine when much of what I was reading spoke equally to the problem of climate change and the challenge of motherhood. Baraitser, in her work on maternal subjectivity, claims that the mother is “profoundly unable to extricate herself from the empirical” and proposes that she “embodies...this split between philosophy and empiricism” (2009: Chapter 3). Through their relentless demands and through our deep engagement with our children, there is little opportunity to withdraw from constant interaction and involvement,

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<sup>12</sup> According to Cohn et al (2014), childcare costs have increased dramatically in the U.S. over the past 20 years, now costing up to 39.6% of a mother's annual income, or as much a \$16,430 per year for an infant.

leading Baraitser to ask, “What happens to us when, not only do we live in close proximity to this irregular, unpredictable and mysterious other, but also we are somehow responsible for them too?” (2008: Chapter One) For myself, working on a thesis during this time has resulted in a collision between theory and reality, or, more accurately, a series of collisions, leading to an awareness that the urgency of environmental catastrophe and the preciousness of our children may, in fact, be deeply resonant if for no other reason than that they both possess an undeniable timeliness. Naomi Klein’s most recent book, *This Changes Everything*, which I explore further in the conclusion of this thesis, likewise considers the inextricability of motherhood and climate change mitigation. She writes about her own challenges starting a family which included a long struggle to conceive, a number of distressing and unsuccessful medical interventions and an eventual pregnancy only after a drastic lifestyle change that saw her move to the woods, stop her incessant travel and greatly reduce her long hours of work. Of the confluence between her own life and her writing on neoliberal ‘extractivism’, she explains,

I tried, at first, to keep these parallel journeys segregated, but it didn’t always work. Inevitably, one would escape its respective box to interrupt the other. What I was learning about the ecological crisis informed the responses to my own fertility crisis; and what I learned about fertility began to leave its mark on how I saw the ecological crisis (Klein, 2014: Chapter 13).

While my own experience was free of these difficulties, I found a compatriot in Klein: it seemed impossible, and risked an inadequate response, to consider climate change without also considering my children who will have to live amid its more crippling effects. Consequently, this project would be incomplete without also acknowledging the vested interest I have in seeing my children thrive on what appears to be a jeopardized planet, particularly when I would like to be able to take blurry pictures of my grandchildren one day. However, the division between theory and life is breached here not only because my children are too precious to ignore, but more so because their existence is too *temporal* to ignore in the context of work that is ostensibly about

time. Just as in their blurry photos, they “emit spacetime” (Morton, 2013: 90) in the sense that they make climate change *matter* as they alter its intensity, change its proximity and shape its materiality in relation to my own thinking. Like a blur caught on camera, the phenomenon of climate change is in a liminal state moving between denial and acceptance, past and future, theory and reality, problem and catastrophe. What it currently lacks in representational clarity can perhaps be offset by plunging deeper into the idea of change itself through a methodology fixated on transition, conveying something more transient but no less concrete about this barely comprehensible event that increasingly intrudes on our existence.

### **Apprehending rhythms**

One sweltering July afternoon in the Florida Keys, I found myself sitting in the living room of Jerry Wilkinson, a local historian still surprisingly energetic in his late 80s, while a huge thunderstorm blackened the sky and torrents of rain pelted the skylights above. Loud rumbles of thunder underscored his words as he described ‘Flagler’s Hurricanes’: two powerful storms that struck in 1906 and 1919 that each delayed by several years the construction of the Florida East Coast Railway’s ill-fated extension from Miami to Key West. This project was a lengthy exercise in the challenge of building and maintaining complicated infrastructure so far out in the ocean, a problem that still plagues county planners a century later. The noise of the thunderstorm was so loud that it ruined my recording of the interview yet I was fascinated that it arrived in time to interrupt his account, emphasizing the constant and menacing presence of extreme weather in the Keys. Jerry, however, seemed unmoved by the coincidence having lived through a lifetime of Florida storms. Hurricane history has always been a principle interest of his, as evidenced by his huge collection of storm tracking maps dating back several decades. As the storm continued around us, Jerry related his experience with Hurricane Wilma and also Hurricane Andrew in 1992,

which was predicted to make landfall “at my house,” he told me, but skewed north, completely devastating Miami instead. “I haven’t evacuated since and I don’t think I would ever bother evacuating again,” he said. “I’m a Floridian; I know the flashlight drill.”

This thesis concerns itself with time, and particularly the future, as it appears within climate change scenarios. Yet the future, as a concept, can be troublesome to address through traditional methodologies in which only the present and past are understood as “empirically accessible,” and in order to incorporate the idea of “futuraity in the logic of social inquiry, we need to find ways to accord material (thus factual) status to the intangible effecting world of processes” (Adam, 2010: 373). One possible solution to this dilemma is to attempt to discern futures through an embodied process of sensing and perceiving through which we can apprehend the development of catastrophic events in the present. According to Beck, future risks like hurricanes and sea level rise provide a “normative horizon, in which the riskiness of the risk... becomes tangible” (1992: 28). This research explores the way these two potential disasters materialize along this normative horizon in the Keys as well as in the geographically distant northeastern U.S., theorizing how catastrophe emerges and is understood through rhythms as diverse as cyclical ice ages, historical hurricane events, a deliberately refrained personal experience or a heartfelt declaration about climate change delivered at a local meeting. The tension in the Keys between a sudden catastrophic hurricane and the slow encroachment of the ocean contributes to a troubling present that can, following Deleuze, be “opened up with the aid of a topology of thought... bringing about an encounter between the past and future” (Ansell-Pearson, 1999: 79). This opening is achieved through a ‘praxis’, which, in resonance with Beck, is also “always determined by the horizon of the future” (Ansell-Pearson, 1999: 79). Praxis, in this thesis, involves using theory to track, embody and

actualize hazards and catastrophes through a future understood as germinal and a past understood as “open and active” (DeSilvey, 2012: 35). The present risk, then, materializes as an “*invoked relational reality*” (Massumi, 2011: 126, original emphasis) along a normative horizon located between perceptions of the past and perceptions of the future, an edge along which “events... do not exist but rather subsist and inhere” (Ansell-Pearson 1999: 121). In other words, the future can be approached through its resonance with the past, manifesting in the transitional present along this same horizon where storms consistently roll in and over the Florida Keys. A praxis using rhythmanalysis to attend to the recurrence and repetition of both regular and impending climatic events can reveal the ways catastrophes form, progress and dissipate, and how risk comes to be broadly perceived. Time materializes through the connections we draw between our selves as subjects and the events taking place around us so that hazards and catastrophes *create* time by way of our efforts of attention, making risk not just a reflexive effect of modernity (Beck: 1992) but also a profound temporal paradigm in and of itself.

Time, from a human perspective, is not an objective progression but is subjectively determined through our encounters, reflections and intentions; it is a reckoning principle through which we selectively and affectively generate a sense of forward movement through and attunement to our surroundings. According to Bachelard, time must be *taught* and “it is the conditions of its teaching which form not just the detail of our experience but also the very phrases of the temporal psychological phenomenon” (2000: 49). If time materializes through an embodied learning process, the degree to which the subjective and visceral participation in hurricanes informs this project is significant. The tension, anxiety, and anticipation unfolding through my own prolonged participation in hurricanes Irene and Sandy permeate the writing and theorizing throughout. This methodology, therefore, involves itself with *learning*

particular temporalities as they relate to events of climate change and extreme weather, lessons through which the climate becomes at once a mundane backdrop and the bearer of a sudden threat. And, of course, underlying all of this, the project was interrupted by the scattered but persistent temporalities of children, a background attunement like the rain's overwhelming cadence against the glass of Jerry's skylights. Research here is enacted through what Law has called a 'method assemblage' which "can be seen as resonance...because it detects all the periodicities, patterns or waveforms in the flux, but attends to, amplifies, and retransmits only a few" (2004: 144). Fieldwork is therefore a process attending to the most affecting rhythms that surface through a precarious but timely nexus of events, a situation in which Lefebvre's rhythm analyst "calls on all his senses... He thinks with his body, not in the abstract, but in lived temporality" (2004: 21). This project's methodology concerns itself with sensing futures as they inhere and as they resonate with the past, gaining 'empirical access' by way of their intensification in the present. Through rhythm, resonance and response, an event-centered methodology plays out along a narrative horizon that cultivates a proximity to the intangible in a world of processes.



**Figure 8.** The top half of a house, washed off its foundations and deposited 500ft down the road during Hurricane Irene; South Newfane, VT [photo: Luke Stafford 2011]

### **The order of immediacy**

My initial field encounter upon arriving in the Keys involved meeting Chris Bergh, local director of the Nature Conservancy, who kindly offered to take my family and I on a tour of sea level rise impacts near his home on Big Pine Key. Since departing the UK five days earlier, we had stopped briefly at home in Vermont and had only arrived in the Keys the previous day. We were rushed and disoriented leaving our run-down duplex and had only a few hours to complete this field visit and return a rental car without incurring fees. We had expected our exhausted one-year-old to immediately fall asleep during the half hour drive from Marathon to Big Pine Key but he did not oblige and was inconsolable when we arrived. My already overheated husband had forgotten to change into appropriate footwear for the walk through Big Pine Key's rugged natural areas; I had forgotten my voice recorder as well as my yet-unused field notebook. It was 9am when we departed Chris's house and the sweltering, humid air had already descended over the islands. The walk was a precarious event: I could hardly pay attention to what Chris was saying because my fussing, sweat-covered son, in a carrier on my husband's back, kept crying as we were trekking along a jagged limestone path riddled with poisonwood trees. I managed to take a few unexceptional photos, but we had to cut the excursion short, accomplishing little despite the considerable energy exerted. Chris, who had brought his own three-year-old son, was very understanding, but I left Big Pine Key feeling dismayed at the prospect of undertaking months of fieldwork under these conditions. It was clear that I would not at any point be a free and unencumbered body able to explore the area at will.

The constant interruption inherent to motherhood forms the premise of Baraitser's excellent work on maternal subjectivity, which engages with OOO to consider the ethical life of the objects a mother uses and encounters as she makes her way through the city. Laden with buggies, bags, and bottles, and restricted by curbs,

doors and escalators, countless things either facilitate easier interaction with the city or hinder her progress as she navigates her way from point A to point B. For Baraitser, it is the incessant nature of this interruption that characterizes motherhood above all other qualities as we are constantly and continuously burdened by small bodies: filling them up, calming them down, cleaning them off, keeping them occupied, arranging their care and being captivated by their changing presence. All of these needs and distractions must be addressed before a mother can secure even the briefest stretch of time to attend to something other than the children, only to be suddenly called away again to address the next maternal demand. Baraitser describes “days that follow nights that follow days in which I am punch-drunk from interruption” (2008: Chapter 4), articulating the relentless, exhausting and all consuming project of motherhood. I read her book, *Maternal Encounters*, entirely on my phone while nursing a baby, rocking a baby, swinging a baby, etc., picking up her train of thought, and my own, sporadically as time and children would allow. The phone, if it didn’t lessen the interruption at least facilitated quick resumption of reading, yet despite the aid of such ethical objects it was often impossible to generate the extreme concentration that academic work requires during these brief and scattered intervals. The mother, constantly confronted by a new threshold between activities, must be able to focus quickly on the task at hand and persist amid regular disturbance, a practice that gives rise to alternate patterns of thought produced through regular disconnection, disengagement and suspension. Despite the considerable frustration this generates, Baraitser argues that it may be possible to recover something from motherhood’s constant interruption as “It is to moments of undoing...that we need to apply ourselves theoretically” (2008: Chapter 3). In other words, interruption may give rise to unconventional and creative ways of thinking: while mothers lose a lot in the way of continuity, perhaps we gain something else in the form of perception, responsiveness and understanding.

Baraitser is careful to explain that mothering is not the exclusive burden of women but rather that motherhood is a position to be occupied by a person of any gender who sustains this constant interruption in taking on the role of a child's world. As she explains, "Motherhood is the pitilessness of the present tense. Reflective space is obliterated," causing the mother to "think in another order—the order of immediacy" (2008: Chapter 3). In the moment of interruption, she suggests, during these "breaches, tears or puncturings to the mother's durational experiences... something happens to unbalance us and open up a new set of possibilities" (Baraitser, 2008: Chapter 4). To think in the order of immediacy is to be constantly confronted with novel events: a new response may be required at any instant so that, for example, a careful reading of Lefebvre is suddenly halted by a crying baby who has woken early and unexpectedly from a nap, or an attempt to observe sea level rise impacts in the company of a local activist is cut short by an inconsolable toddler. No independent thought or action is safe for long and we are constantly drawn back to the moment by the immediate needs of the children, a process by which motherhood establishes "a renewed temporal awareness where the present is elongated and the past and future no longer felt to be so tangible" (Baraitser, 2008: Chapter 3). This requires a particular kind of aptitude in which we must be able to focus utterly on one thing and then a second later focus utterly on something else. It is in this space of transition between two foci where the split between philosophy and empiricism is inhabited by the mother-as-world, where the emergence of temporality is excruciatingly evident in the constant gaps the children create in any sense of continuity. As Baraitser explains,

To interrupt is to perform a stop in this flow, to punctuate the flow thereby creating a 'between' or 'among' in an otherwise undifferentiated continuum. And of course, paradoxically the break gives rise to something. It creates a segment, a discrete object where before there was just flow. In doing so, this intervention into flow shows up flow as flow (2008: Chapter 4).

Likewise, the central idea in this thesis is that interruptions of all kinds show up flow as

flow—storms, catastrophes, births—so that, like the pictures of my blurry children and their blurry activities, these events produce something concrete from the radical immediacy of transition. That something, I suggest by way of the following chapters, is time.

It is transitions, thresholds and interruptions that populate these pages: the water between islands, the shift between geological epochs, the progression between past and future, the distinction between internal and external. The project withstood the intrusion of catastrophic hurricanes and climate change itself, an event that demands attention through its potential to bring about our collective undoing. These disruptions, compounded by the constant interference of children, produced a strange and irregular topography of research that is best approached through a willingness to “understand relentless interruption as not just depleting but generative” (Baraitser, 2009: Chapter 4). Instead of scrambling to keep up with changing life circumstances, shifting fieldwork demands, and any other challenges that confront us on the path from A to B, this idea allows a mother to more fully inhabit the resulting transitions and “to stop ‘trying to get back’ to what she was saying, thinking, remembering, doing, and to recuperate some of this experience as a new way of thinking” (Baraister, 2008: Chapter 4). Thus empowered, I am able to conceptualize the years spent distracted by my children as something other than ‘lost’ time, an appealing prospect because the event of motherhood actually felt very productive from an intellectual standpoint. Although there is a perception that raising children lacks the academically useful kind of rigor, I would argue that working on such a substantial project simultaneously is like training at high altitude where time, not unlike oxygen, is thin, weak and unsettled. By allowing ourselves to be relentlessly drawn back to the present, disparate events and the transitions they invoke can open our work up to new sets of possibilities and new styles of response. Buoyed by Baraitser’s endorsement to think in the order of immediacy, this

perspective enables semi-thwarted field encounters, natural disasters and the generative myopia of motherhood to coalesce into a cohesive if unconventional proposition.



**Figure 9.** Baby in motion [photo: author]

### **Methods for event-centered research**

On my first field visit to the Keys, I managed to find a surprisingly inexpensive vacation rental in the small city of Marathon in the middle Keys. This seemed to be an acceptable arrangement until a week before our arrival when I started receiving panicked emails from the owner informing me that her caretakers were having a difficult time evicting the previous tenant. With apprehension, we finally arrived at the tiny duplex in the stifling summer heat to find an old Austrian couple, the caretakers who lived in the other half of the duplex, smoking extra-long cigarettes and complaining bitterly about the former resident who for months had been selling drugs out of the apartment at all hours of the night. The County Sheriff had only forced her out that morning and they were frantically trying to clean the place before our arrival. The neighborhood itself was in a part of Marathon known as Little Venice for its numerous canals offering homeowners direct access to the ocean. Huge boats were parked in the water behind a number of elaborate and well-kept homes, although many of these were boarded up with storm shutters; boats were wrapped in plastic on trailers in the driveway, awaiting the return of their owners during the milder and less stormy

winter months. Our duplex was one of the homes without canal access and across the street a house surrounded by a chain link fence harbored two rather menacing dogs. The compound was occupied by what appeared to be a large extended family of illegal Cubans who had parked a number of rusting cars in the yard. The neighborhood was an odd blend of wealth and hardship, indicative of the Keys themselves: a mix of weirdly coexisting outsiders, with an underlying element of impermanence. Locals are friendly to newcomers because most of them were originally newcomers themselves, having come to the Keys on vacation only to decide to stay indefinitely.

It was within this transient milieu that I launched what would turn out to be a befittingly turbulent study of transition and it was a relief to arrive in the Keys to find a very colorful and accommodating public, particularly considering the family-related chaos that constantly hampered my movements. Despite these challenges, I was able to gather much from my initial field experience on Big Pine Key, as well as the many other rushed and harried encounters that constitute the bulk of this fieldwork. This research was undertaken in short bursts, initially comprising two intensive field visits to the Keys, each one month long, undertaken in July 2011 and October-November 2011. In the interval between these field visits, the surprising event of Hurricane Irene occurred while my family and I were in the process of moving home to Vermont, not only adding substantially to my fieldwork but also causing a significant paradigm shift within the research by which hurricanes suddenly assumed a much greater importance. This hurricane experience was supplemented by sporadic interviews and archival research in Vermont during 2011-2012. After Hurricane Sandy further complicated the research process in October 2012, three trips were taken to New York, to gather stories and images from this storm while simultaneously paying social visits to friends and relatives. At the same time as this fieldwork generated a substantial volume of empirical material, however, there were a number of regrettable lapses in the research, including

the fact that I did not take enough photos while in the Keys or during Hurricane Irene, nor did I spend enough time engaging with the mangrove colonies bordering the Keys, which became a growing fascination throughout the writing process and a focus of my theoretical assertions, particularly in the concluding section of this thesis. Yet as research attuned to events both expected and unexpected, a number of themes and directions clearly emerged. What follows is a general summary of methods through which the project explores climate and its changes in the Florida Keys and beyond by way of four interrelated approaches, including a lengthier and more theoretical element addressing the two unanticipated hurricanes that form the cornerstone of this event-centered methodology.

### ***1. Semi-structured interviews and participant observation in the Florida Keys***

The first and most deliberate element of fieldwork involved a series of 32 semi-structured interviews, as well as three modest participant observation approaches, all undertaken in the Florida Keys. These interactions provide an essential grounding for the thesis in that “interpretations of the world... start, if not end, with the personal interactions that take place in interviews” (McDowell, 2010: 170). Straddling the divide between expert and member of the public, a large subset of these interviewees are what Halvaksz and Young-Leslie refer to as ‘ecographers’, individuals “situated at a nexus of information and events, bisected by time, and possessing an intimacy with their environment” (2008: 187). In creating this category, they call for “a refocus on the work of specific individuals in imagining and reimagining local ethno-ecologies” (2008: 184) and define ‘ecographic thinking’ as “the creativity of specific persons in the reciprocal interactive process of mutual inscription and reinscription of places and their denizens” (2008: 184). The process of finding these individuals responsible for reinscribing the Keys in the face of climate change was largely undertaken by way of what one local referred to as Key West’s ‘coconut telephone’, a quirky description of the snowballing

effect (Valentine, 2005) often emerging in research. Over the course of fieldwork, I interviewed a number of prominent environmental advocates, including the directors of the National Marine Sanctuary (NMS) and The Nature Conservancy (TNC) as well as representatives from various organizations dedicated to protecting coral reefs, reducing development in the islands, protecting local wildlife and lobbying the government to enact sea level rise mitigation. In addition to these ecographers, I also conducted interviews with the Key West Emergency Manager, two meteorologists from the Key West National Weather Service (NWS), the head of the Florida Keys Mosquito Control District, the editor of the local newspaper, the city utilities manager, a former four-term Key West mayor, the head of the Keys Aqueduct Authority, several prominent members of Key West's gay community, a number of local artists, several realtors, one of the most prominent property developers in the Keys, two people involved in insurance reform and a number of local government officials. Overall, some of these interviews were recorded while others were not. Those individuals working for government entities like the NMS and the NWS, for example, did not consent to recording. Other interviews were undertaken in noisy bars or traveling in vehicles, which also presented challenges to recording.

In addition to these interviews, I also engaged in three modest participant observation approaches, the most important of which was with The Nature Conservancy (TNC). The organization's director, Chris Bergh, was by far the most accommodating participant in this research and also conveniently, the most embedded in the Florida Keys environmental community. His success as a climate change mitigation advocate comes from the social legitimacy he possesses as a life-time Keys resident as well as the professional legitimacy he possesses as a scientist and conservationist, and he is using this position to spread an unpalatable message to an often-reluctant public. He attends every relevant local and regional meeting for the

opportunity to stand up to remind government leaders and residents to turn their attention to climate change; he has published a number of academic papers presenting sea level rise figures for the lower Keys<sup>13</sup>; he has publicized the issue through national media outlets; he created a Florida Keys Future Scenarios Mapping tool through the Nature Conservancy that allows locals to input and visualize various flooding scenarios<sup>14</sup>; he set up a website featuring photos of locations throughout the Keys that already become inundated during high tides<sup>15</sup>; and he has been visiting influential local business owners for the past several years with sea level rise prediction maps to convince them to diversify their interests before it is too late. During my fieldwork, I had the opportunity to follow Chris to a number of government and community meetings throughout the Keys, including those at which the Monroe County Climate Change Advisory Committee (CCAC) was actively working to draft their guidance document for county-wide policy regarding sea level rise. The second participant observation effort I undertook involved spending a considerable amount of time attending meetings and planning workshops of the CCAC as it attempted to draft policy to prepare for and mitigate sea level rise in the Keys. This effort offered insight into both the challenges and the minutiae involved in enacting climate change legislation as the committee members, the local stakeholders and other interested parties were in no way in agreement on the degree to which the government should involve itself in mitigation efforts or even the necessity of doing so. In combination, the time I spent with The Nature Conservancy and the CCAC form the conceptual basis for Chapter Five, which explores the way political work serves to resignify the present amidst the transition of a changing climate. The third participant observation effort involved spending a day following the Key West Utilities manager as he dealt with issues involving the city's

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<sup>13</sup> see Zhang et al, 2011, 2012.

<sup>14</sup> <http://coastalresilience.org/geographies/florida-keys> (visited August 5<sup>th</sup>, 2015).

<sup>15</sup> [http://www.flickr.com/groups/sea\\_level\\_rise/](http://www.flickr.com/groups/sea_level_rise/) (visited August 5<sup>th</sup>, 2015)

state of the art waste management plant, drainage systems and other infrastructural systems that are already being compromised by sea level rise. This included a lengthy tour of the city's impressive new waste-management plant, which collects sewer water, extract its solid materials and trucks them to a landfill in mainland Florida. Remaining liquids are treated before being sent down injection wells to an aquifer thousands of feet underground through which they will eventually emerge after a hundred years deep in the ocean between Key West and Cuba. This process was tremendously interesting but in the end offered only background insight into the extreme challenge of maintaining safe and effective public infrastructure in such a remote location.

## ***II. Ambient encounters***

Despite thorough planning, in practice it turned out to be the casual and spontaneous fieldwork encounters that proved most useful, supporting the idea that “method is always much more than its formal accounts suggest” (Law, 2004: 144). Quick and frequent exposure to locals, called ‘ambient’ here because these events generated an atmosphere of continuous, productive encounter, formed a persistent background to this research as part of a greater effort of attunement and response, even beyond the Florida Keys. The word ‘ambient’ here refers to the affects “surrounding, encircling, encompassing, environing” (OED, 2015) a particular context and these encounters enabled me to gather both a sense of the Keys as a location with a specific character and a sense of the urgency with which locals were experiencing the presence of extreme weather and sea level rise. The Keys possess a particular ethos of friendliness through which I remained in constant, busy engagement with the place and its residents, helped by the fact that I often had a baby with me to attract attention. Locals were consistently enthusiastic about sharing their stories, with very few exceptions. These ambient encounters, relying on the ‘infectious agency’ (Greenhough, 2010) of the researcher, also offered the opportunity to engage with temporalities of

preparedness and coping as locals anticipate the lived consequences of both sea level rise and increased hurricane activity. I was constantly examining storm shutters and stilt-houses, looking at hurricane photos, being directed to places where salt water creeps up through sewer grates at high tide and landmarks that had either remarkably survived or been tragically destroyed in a previous hurricane. I gained an understanding of the weather-related precautions required for life in the Keys and also the expense and anxiety involved in owning a home in such a vulnerable location. It was through these encounters, in particular, that I discovered there is surprisingly little public concern for sea level rise in the Keys, as, on virtually every occasion, when I tried to speak to people about sea level rise they directed the conversation to hurricanes. Although I genuinely expected locals to be concerned about sea level rise, I arrived to find that their concerns are much more complex.

Much of this ambient work was assisted by Key West filmmaker Tim Dahms who, as a consummate gatekeeper, was instrumental in facilitating hours and hours of interviews, events and interactions involving the local gay community, including access to the very surprising after-hours world that takes place in the back rooms of local gay bars. The degree to which the gay community is seamlessly integrated into, and largely responsible for, the culture and politics of the Keys is remarkable. This phenomenon is encapsulated in an encounter at a popular gay club in which the city police chief, sitting at the bar with his wife, interrupted his deep conversation with a renowned local drag queen to offer to drive me around in his patrol car for a day in aid of my research. These interactions seemed like they would be useful at the beginning of this project when I was trying to cultivate a sense of the 'edginess' of the Keys, not just as a physical edge of the country or a place on the threshold of certain inundation but as a cultural edge in which locals are more free to cultivate other ways of being and, more importantly, being together. However, these efforts were undertaken before the

research was interrupted by the two storm events in the northeast that redirected my narrative, so that this disproportionate amount of work in the end resulted in only a handful of sentences. Nonetheless, these efforts provided a crucial backdrop for this project in that they helped discern the temporalities by which people inhabit the Keys in counterpoint with the dual temporalities of hurricanes and sea level rise.

### ***III. Historical inquiry***

I also spent a considerable amount of time engaging with local history through extensive interviews with two local historians and several days spent at the Florida Keys Historical Archives at the Monroe County Public Library. These archives seemed to be well-used by locals and tourists alike and I often found people willing to discuss my research thanks to the characteristic Key West congeniality. Hurricane materials were conveniently categorized by storm and although these collections were somewhat haphazard they included numerous articles from local newspapers both anticipating the storms as they approached the Keys and dealing with the destructive aftermath, which inspired Chapter Four's treatment of hurricane tracking. Of specific interest were the yearly articles heralding the arrival of hurricane season, as well as those reporting the development of new forecasting techniques, including radar, reconnaissance aircraft and communication systems. The collections also included vintage accounts from ship captains and Navy forecasters of storms prior to the twentieth century, as well as articles concerning particularly catastrophic storms further afield, such as Hurricane Camille which devastated Mississippi in 1969 and which clearly resonated enough to be included. Also useful were old postcard collections celebrating tourism and development, aerial photos showing gradual construction of the Keys from former mangrove swampland and documents chronicling the islands' ongoing mosquito control problem. One particularly informative discovery was a folder of climate change and sea level rise materials that a former local had spent years compiling and

eventually donated to the library, an irregular collection of articles dating from the mid-1980s when the idea of climate change was in its infancy and still wildly speculative. My approach to these materials could be described as opportunistic digging, assisted by historian Tom Hambright, curator of the archives, who moved to the Keys decades ago as a member of the Navy. Poring through historical materials can be a very lengthy process and with my limited baby-free time I opted to make countless photocopies of anything useful or intriguing which I then had available for perusal when needed. This was an expensive approach but it was helpful to be able to revisit the material periodically, a process that allowed room for temporal resonances to emerge and informed the narrative quality of this thesis which considers the Keys through the concept of “anticipatory history” (DeSilvey, 2012), exploring how historical residues of past hurricane destruction can inform, complicate and animate a future that is expected to include not only more frequent and powerful hurricanes but also the slow encroachment of the ocean. Research also benefited from the input of local historian Jerry Wilkinson who shared his enthusiasm for the Florida developer and prominent nineteenth century capitalist Henry Flagler and maintains a website<sup>16</sup> containing, in particular, many fascinating historic photos of Florida. These efforts in the Keys were supplemented by several days of storm-related archival research in Vermont at the Brooks Memorial Library’s Local History Room and at the Brattleboro Historical Society. This work was undertaken during repeated visits from 2011-2013 and, although these archives were smaller and less social than those in the Keys, my approach to this material was similar: collecting gripping storm accounts, old photos and reports of anticipation and destruction. Altogether, this historical inquiry was central in developing a sense of the ways weather-related catastrophes resonate across centuries, locations and subjectivities.

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<sup>16</sup> keyshistory.org (visited August 5<sup>th</sup>, 2015)

#### ***IV. Cultivating interruption***

As mentioned, the field site moved itself into more personal territory quite unexpectedly on two occasions: in August 2011 when the remnants of Hurricane Irene caused devastating flooding in Vermont and in October 2012 when Hurricane Sandy inundated New York with a 12 foot storm surge. Fieldwork is understood as an active endeavor in which researchers deliberately involve themselves in particular contexts, making research “a process of knowledge production that is always, and unavoidably, an intervention in the world in which all those (humans and non-humans) enjoined in it can, and do, affect each other” (Whatmore, 2003: 90). However, fieldwork also unfolds through unforeseen events in which the world can be understood as intervening in the researcher in surprising and transformative ways. Throughout Hurricane Irene and its aftermath, I was an involuntary participant in an overwhelming and unexpected act of the environment, a situation that was more consistent with ideas of practice in which events do not “comfortably fit this grammar and category of action and doing” (Harrison, 2009: 996). After Irene, I was stranded with my family on a mountain for three days with no information from the outside and no feasible way to escape. Suddenly there were no roads, no electricity, no phones or Internet, so that our mobility and communications were remarkably limited, aside from our anxious movements throughout the sparse mountaintop neighborhood that had suddenly become our entire world. In resonance with Baraitser’s valorization of interruption, Harrison’s work on corporeal vulnerability can help to theorize this muted and contained space through its “attempt to locate sources of signification which lie outside those derived from practice” (2009: 1005) and to “offer a revaluation of apparently privative or passive corporeal states, experiences, and phenomena” (2009: 1005). The visceral experience of these unexpected and immobilizing storms is not reproducible in any research setting, in that there is no conceivable way to even attempt to create or

recreate a catastrophic hurricane in order to affect a project on hurricanes. Their strange conjunction in the context of a study already involving hurricanes suggest that “interruptions of comprehension...cannot be brought into the systemisation, thematisation, and conceptualisation that defines the work of social analysis” (Harrison 2007, 591). Instead, these hurricanes inhabit what feels like a supra-empirical space, “dwelling in uncanny experiences of duration” (Connolly, 2011: 7), somehow beyond action and understanding.

These catastrophic storms were *experienced* as much as, if not more than, they were *researched* and their empiricism derives from the affectivity generated through direct participation in Hurricane Irene and compulsive tracking of Hurricane Sandy from the UK. To amplify these experiences, and following Stengers’ call to “answer challenges and experiment change” (2005: 195), I further engaged with the storms by extensively perusing media accounts, collecting hurricane stories from friends, family and other locals and, in the case of Hurricane Irene, conducting a series of 9 interviews with individuals deeply affected by the storm or involved in community-building and disaster management in its wake. These included several people whose property was seriously damaged, the founder of a post-disaster community group, organizers of an annual parade to commemorate the storm and a representative from the Federal Emergency Management Agency (FEMA). It proved awkward, however, to try to reconcile the first-hand accounts of others with my own visceral entanglement in the storm. My position with regard to Irene complicated what Law describes as the “enactments of relations that make some things (representations, objects, apprehensions) present ‘in-here’, whilst making others absent ‘out-there’” (Law, 2004: 14) in that further interviews compounded the inexpressible exhaustion that accompanies a catastrophe and made any enactment of further relations seem both overwhelming and unproductive. As already part of the ‘in-here’ of Hurricane Irene,

experiencing even more 'in-here' became difficult to bear, like poking at a wound. More useful in addressing this storm were events along the lines of the 'ambient encounters' described above and, particularly, local archival research which contributed much to the discussions of history and subjectivity in Chapter Six. Similarly, I spent several days in New York during 2013 cultivating ambience in relation Hurricane Sandy, an effort which primarily involved visiting friends and family who recounted their shock at the sudden storm surge, showed me photos of the destruction and expressed despair at insurance policies that hampered rebuilding. These encounters with Hurricane Sandy were much more compelling than those concerning Irene, yet there was a degree to which this research couldn't adequately metabolize a second hurricane experience. I could easily have constructed an entire thesis around either my fieldwork in the Florida Keys or the event of Hurricane Irene, and the event of Sandy simply created too much empiricism to accommodate. There is a sense that I hope comes through in this writing that Hurricane Sandy's resonance was more important than its details so that the fact that it occurred—it's proximity and temporality—mattered much more than how the event played out on the ground.

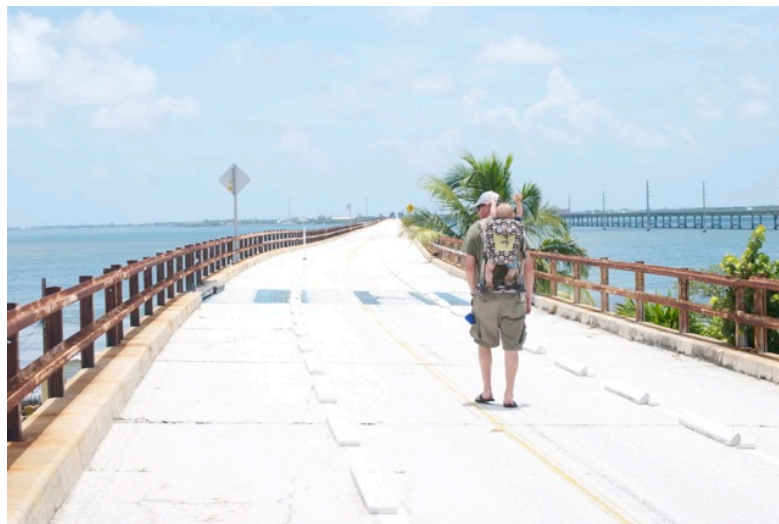
The problem, in the end, with both of these storms is "one of how to hold on after the event to those moments in which researchers find themselves lost for words in the face of some unexpected possibility that bodies forth in the knowledge production process" (Whatmore, 2003: 98). They left me scrambling to account for this space in which so much was suddenly lost, even while comprehending that, following a disaster, "the loss of sense that ensues, is also, in a strange and paradoxical way, generative" (Clark, 2011: 73). One way to retain this generativity is to use interruption itself as a guiding principle through which to apprehend the various rhythms of disturbance, suspension and transition that resounded most clearly within the space of research. Rather than comprising a set of fixed procedures, methodology involves

*“crafting bundles of ramifying relations that condense presence”* (Law, 2004: 122, original emphasis), a process able to account for the unexpected as it forms *“a pattern against an endless background of noise”* (2004: 109, original emphasis). Finding resonance in spaces of change, therefore, provides a way to retain the storms—like the interruptions of motherhood—as sources of provocation and creativity, emphasizing the condensed presence of transition itself by calling attention to the liminal spaces in which worlds and realities are produced. These moments of “inert compulsion” (Harrison, 2007: 594) whereby I was both immobilized but also affectively propelled towards efforts of attunement and response resulted in an unintentionally embodied approach in the sense that “to grasp a rhythm it is necessary to have been **grasped** by it; one must *let oneself go*, give oneself over, abandon oneself to its duration” (Lefebvre, 2004: 27, original emphasis). Whether losing oneself voluntarily in a crowded city, like Lefebvre, or, as in my case, being unexpectedly overwhelmed by a severe weather event, rhythmanalysis involves a certain relinquishing of self in response to the vital temporalities of the changing environment. Climatic futures materialize through what Bachelard calls “the realism of rhythms” (2000: 79) by which “the real action of time requires the richness of coincidence and the syntony of rhythmic efforts” (2000: 20). The “rhythmanalyst” must therefore “arrive at the **concrete** through experience” (Lefebvre, 2004: 21, original emphasis). To have been grasped by the climate twice over in this way has not only forced me to look at my own manifesting relationship with climate change, but has also allowed me to share with my informants the overwhelming and unsettling participation in the extended event of a hurricane. Hurricane experiences, in other words, have transformed this thesis from a discussion of disembodied catastrophe to an active engagement with storm events sensibly apprehended through the rhythms of coping and processing, the rhythms of preparing

for and anticipating future storms and the rhythms of this research and writing enacted across various locations.



**Figure 10.** The 'Little Venice' neighborhood, Marathon, Florida [photo: author]



**Figure 11.** 'Reluctant and uncooperative bodies' on the Old Seven Mile Bridge that once supported the Overseas Railroad and later the Overseas Highway [photo: author]

### **Writing transitively**

During one Climate Change Action Committee (CCAC) meeting I attended while in the Florida Keys, the group was discussing the prospect of attracting scientific interest to the area to both publicize the plight of the islands as well as generate ideas and funding for mitigation efforts. One member asked me to stand up and introduce myself as an example of how the Keys are already attracting researchers. I explained to the group that I was happy to be there and very interested in their work, but that I was

not engaging in the type of systematic study of climate change that would be of any use to them. This response generated some laughter, but the interaction did beg the question: what was I, in fact, *doing* with regards to sea level rise specifically and climate change more generally? The extensive and transitional nature of climate change as a phenomenon makes this a difficult question to answer in that “‘what is to be done’ in this context is not an inquiry that leads to closure or prescription, but rather to openings within practices” (Gabrys and Yusoff, 2012: 15). All along, this has been a difficult project to describe to informants and other interested parties, not because my intentions were unclear to myself, but because the project progressed as affective encounters with the climate took on the rhythms of a narrative and temporalities emerged through the progression and interaction of various events. This speaks to the importance of the growing effort to articulate a set of theories and practices that specifically address creative and experimental geographies (for example Last, 2012; Kullman, 2013; Marston and de Leeuw, 2013; Hawkins, 2014, 2015). My inability to effectively communicate my intentions to project participants reveals more of a lack of existing vocabulary, I believe, than a robustness on the part of the research itself: ‘creativity’, as a broad descriptor for an ambiguous idea, remains difficult to clearly define and even more so to enact in any systematic way. As Hawkins explains,

in practice it is much easier to write into an account the mastery of the singular subject, to insert the fetishism of clarity into what is written, much harder is to write against the grain of teaching, to write accounts which not only demand space for, but also enact the overflow of meaning, structure and argument (2014: 201)

Fortunately, no one I encountered in the Keys or elsewhere really cared to hear about the goals of my fieldwork beyond my general concern for climate change and hurricanes. This reprieve from detailed explanation granted the project some room to allow thinking to progress in conjunction with the research and its constituting events so that fieldwork was “about the act of imagination, about thinking the powers and

limits of the bodies around you” (Thrift, 2003: 106), an effort that neither made any firm commitments nor delivered any clear answers. Instead, the project attempts to open up the affective dimensions of particular climatic challenges, less to call attention to the problems themselves, and even less to offer solutions, and more to explore “how geographers’ own creative practices might make worlds in ways we have long appreciated the creative practices of others to do” (Hawkins, 2015: 250). In effect, my hope was to use writing as a tool to creatively theorize the way climatic events generate time as we understand it.



**Figure 12.** Interrupting movement [photo: author]

Sea level rise is not a simple dualism, pitting sea against land or past against future. It exists in the context of a changing climate manifesting as a shifting confluence of materials, affects and resonances—including catastrophic weather—distributed unevenly across the globe. This project concerns itself primarily with a chain of low-lying islands that is ‘betwixt and between’ in a world that is itself always in between. The result is an archipelagraphy of ideas that behave less as a statement on the climate and more as a series of climate-related interruptions; as “diffuse and unsteady articulations and entanglements of self and research subject” (Hawkins, 2014: 191), the

force of which shift and accumulate like the mangrove islands of the Keys themselves, shaped and affected by the turbulence of water and weather. The subsequent chapters craft patterns from the materials and events that accumulated throughout the fieldwork process, following Lefebvre's insistence that the rhythm analyst must *bring* something to the 'everyday', rather than just reflecting on it (2004: 25). The principal agenda of this thesis is therefore to deliver the sensory impact of an experience, to produce affects, sensations and stories from the transitional force of climate change in order to allow "the qualities of movement to animate the logics of geographical thinking" (McCormack, 2009: 136) as it unfolds in the spaces between apparently stable forms. This effort requires a certain vigilance with regard to potential: an openness to the unplanned and unexpected, a willingness to make apparently disparate things *matter* and *move*. James has identified a "distinction between knowing as verified and completed, and the same knowing as in transit and on its way" (2003: 35), and correspondingly this project constitutes a *knowledge in transit* that attends to thresholds of change.

Admittedly, one reason I enjoy taking blurry photos of my children is that it provides a small way for me to interrupt them in return. Likewise, by "foregrounding the expressive instance" (Guattari, 1995: 22) the writing style here seeks to cultivate the blur of events-in-progress along a narrative horizon between a fluctuating past and an unstable future. According to Law, the purpose of research is to "creatively detect and select appropriate similarities between instances whilst ignoring others" (2004: 108), which is done in order "make realities and hold them steady for a moment against a background of flux and indeterminacy" (2004: 10). However, it may also be interesting to deliberately *foreground* the flux and indeterminacy, which is what the blurry photos of my children attempt to do. They are snapshots that enframe various events or circumstances, bundling their rhythms intentionally within an aesthetic of transition. If

research involves the production of worlds, as Law argues, then it must also be noted that “Worlds need horizons and horizons need backgrounds, which need foregrounds” (Morton, 2013: 104). Just as I provide a background of continuity for my children, they provide a background resonance for this research, the playground provides a background for their bustling activity and we are all backgrounded by the looming threat of climate change. These things all time each when configured in particular ways and, in essence, what blurry photos do is foreground the background so that what comes into unfocused-focus is the horizon of temporality itself. In other words, by thus switching foreground with background these compositions interrupt movement in order to, as Baraitser has explained, show up flow as flow. The chapters of this thesis, therefore, function as a series of blurry photos, each framing events in motion that time each other, transitively, like smeared pixilation rendered into words.

### **In pursuit of eventful time**

Along with incessant interruption, the event of childbearing also generates a constant, unrelenting threat of maternal failure that underlies any other work we may take on, an idea that plays out in this poignant quote from Rachel Cusk:

It is not love that troubles me when I leave the baby, like a rope and harness paid out behind me wherever I go. It is rather that when I leave her the world bears the taint of my leaving, so that abandonment must now be subtracted from the sum of whatever I choose to do (2001: 87).

Baraitser (2009) expresses a similar idea as she describes the extreme ‘viscosity’ of motherhood whereby we constantly get stuck, hindered and caught up in the needs and desires of others. It is tremendously difficult to overcome this stickiness to become a competent mother and a competent worker simultaneously, and there are no institutional systems that recognize the feats of endurance and concentration required to engage at once in these barely compatible temporalities. This forces many of us to live with the incongruence of a choice that feels empowering—spending time with our needful young children—but is met with little respect. From my perspective, slowly

working on a DPhil offered just enough legitimacy to counterbalance the low status position of being somebody's mother while still allowing the space to effectively parent, and to a certain degree this was intentional: I was told many years ago by a pregnant and harried undergraduate supervisor that I should endeavor to have children while working on a PhD because my time would be more flexible. Although it has been frustrating to have so little self-autonomy the past several years in the face of motherhood, I consider myself fortunate at the very least to have had someone earnestly warn me about this early on so that I might possibly discover a more acceptable way through. There is a clear need for a narrative of alternative pacing that recognizes, and perhaps even validates, the choice to prioritize spending this irreplaceable and fleeting time with our children at the expense of all else. The U.S. is, appallingly, the only industrialized country that doesn't mandate paid leave for mothers of newborns, but despite more generous laws in the rest of the world<sup>17</sup>, there is still no standardized speed at which we feel comfortable parting ways with our children. Yet while we are undoubtedly and necessarily slowed down by mothering, there is evidence that we do catch up in the end: a recent study found that while each child results in a significant loss in research productivity, mothers are more productive once their children become teenagers so that over the course of an academic career mothers produce more research output on average than non-mothers of both genders (Krapf et al 2014). In other words, mothers of two or more children are more productive than absolutely everyone, some small proof, perhaps, that disruptive events can nonetheless be remarkably useful.

Despite any long-term benefits, there are few things more distracting and labor-intensive than having a baby, a fact that is not only under-acknowledged but also

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<sup>17</sup> U.S. mothers are guaranteed only 12 weeks of unpaid 'job protection'; of 185 countries studied, the U.S. and Papua New Guinea are the only two that have no legal provision of paid compensation for maternity leave (International Labor Organization, 2014).

under-discussed by mothers themselves reluctant to require special treatment or appear less competent. As a result, “childbearing and childrearing undoubtedly remain key sources of gender inequity in the academy” (Klocker and Drozdowski, 2012: 1271), a fact that bears consideration here not only to account for what I understand to be shortcomings and inconsistencies in my fieldwork but also because an event-centered methodology recognizes that all events potentially matter when thinking in the order of immediacy. The event of childbearing is accompanied by the very real challenges of morning sickness, infant-related sleep deprivation and the intensive temporal commitment of breastfeeding, all of which thoroughly impacted my effectiveness throughout this entire process. Without a doubt, bearing children has a huge impact on the trajectory of a woman’s success so that we are “systematically unable to meet the requirements of the ideal academic who gives full priority and all his time and energy to his academic work” (Bailyn, 2003: 139-140). This is not to discount the work of the many excellent fathers out there, but speaking of ‘parenting’ without regard for gender ignores the ways in which maternal bodies, specifically, are controlled, restricted and culturally mediated (Park, 2006) as well as the fact that they maneuver within a context already complicated by gender inequity and entrenched biases. From our initial steps into academia, university faculty are less likely to reply to requests from prospective female students (Milkman et al, 2015) and, once accepted into a graduate program, as a woman you are less inclined to speak in group settings (Karpowitz et al, 2012) and will be interrupted more frequently when you do speak (Hancock and Rubin, 2014). You are also not understood to possess the innate ‘genius’ required for intellectual ascendency (Leslie et al, 2015). If you take some time off to reproduce you will be disproportionately responsible for childcare and housework (Mason et al, 2006)<sup>18</sup>, each

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<sup>18</sup> According to Mason et al (2006), and based on a study of the University of California system, women faculty age 30-50 with children report spending over 100 hours a week on professional, domestic, and care giving activities compared to men age 30-50 with children who report spending 85 hours a week on the same activities; all faculty without

child will 'cost' you the equivalent of three published papers per year (Klocker and Drozdowski, 2012) and you would need to receive an extra \$66,000 per year to offset the 'stress cost' of birthing and raising each child (Buddelmeyer et al, 2015). You will likely resume work well before you're ready in order "to be taken seriously as an academic" (Mason et al 2006) and may need to negotiate uprooting your entire family, possibly including a partner with an established career, for a temporary and low-paying job where you can expect to be perceived as less competent and receive a lower salary (Correll et al, 2007). You will also be evaluated more harshly than your male counterparts and held to higher standards by students (Johnson et al, 2008) and your appearance will be constantly scrutinized as you run the risk of presenting yourself as either too feminine, and therefore unprofessional, or too masculine, and therefore overly aggressive (Stavrakopoulou, 2014). Considering the degree to which women are underrepresented in geography departments in the UK (Cragg, 2003)<sup>19</sup>, you can look forward to spending much of your time in the company of men who do not entirely comprehend these challenges. If you finally make it to the top you will be among the mere 28% of women who hold full professorships in the U.S. and Europe (European Commission, 2015; Curtis, 2011). Confronted with such inhospitable conditions, it's no surprise that female attrition rates are significant across disciplines as many women "see academic careers as all-consuming, solitary and as unnecessarily competitive" (Rice, 2012: unpaginated). Or, to put this in more empowering language, many of us are choosing to reject the patriarchal bargain that an academic career currently entails.

It behooves a greater number of mothers, therefore, to dispense with the expectations of relentless performativity and the fetishisation of hard work in order to

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children spend no more than 80 hours a week on these activities. The number of hours spent on care work by men and women with children doesn't converge again until age 60.

<sup>19</sup> Based on a casual survey of Oxford's School of Geography and the Environment website (visited August 7<sup>th</sup>, 2015), of the total 'Academic Staff' in the department only 28% are women and women hold only 25% of departmental professorships. It is unknown to the author how many of these women have children.

reject “the isolating, embodied effects of neoliberal temporal regimes” and to contribute to a “politics of resistance to the accelerated timelines of the neoliberal university” (Mountz et al, forthcoming: 3). This involves questioning the “toxic shame” (Gill 2009, 14) experienced when we fail to meet the demands for relentless publishing, conferencing, administrating, auditing and networking that would enable us to win job security, rank and respect, but leave us with little time to be kind to our children. Indeed, “Current practices have exacerbated the competitive, masculinist, long-hours culture of university departments” (McDowell, 2004: 159) to the point that this academic crisis and anthropogenic climate change may, in fact, be analog catastrophes both produced through the metabolization of resources by the insatiable neoliberal model, whether those resources come in the form of fossil fuels or human wellbeing. While I address this idea at greater length in the concluding chapter, I remain firmly committed to the “*slow radicalism*” (O’Neill, 2014: 16 original emphasis) proposed by O’Neill and others (for example Martell, 2014; Mendick, 2014; Mueller, 2014; Treanor, 2015) which seeks to repair “the deep affective crisis marked by an ever present undercurrent of anxiety, shame and humiliation—at not keeping up or measuring up-or indeed the opposite a satisfaction at *making it* and the anxiety evoked in sustaining this” (O’Neill, 2014: 7). Rather the ‘slow university’ concept allows us to account for and even embrace the interruptions inherent in motherhood and other life events, understanding these as often producing worthwhile outcomes and espousing an alternative paradigm by which intellectual rigor is not understood to be subject to temporal constraints. O’Neill questions whether it might be possible to have a framework in which, “*slow* is a catalyst for creative and critical thinking in relation to the university, for fostering a space between subjectivity and objectivity, the particular and the general, for thinking against the grain” (2014: 2). Clearly, it will involve finding new ways and new speeds of and for being intellectual and thinking interruption as

generative is a step in the right direction in that, echoing Baraitser's argument, the slow university movement emphasizes the ways in which "research conduct is a genuinely inventive activity, defined by temporal non-linearity" (Vostal, 2015: 87). Interruptions don't need to be ignored, downplayed or tolerated but rather can be drawn into a reflective space where they are made to matter, so that what we are

seeking is not *more* time, as important as that is, but rather *eventful* time; not just more hours to work within the linear time of capitalist development, but rather conditions in which our work—individually and collectively—can become its own productive, self-positing and self-differentiating movement (Meyerhoff et al, 2011: 487, original emphasis).

This is not only an effort to justify my own slowness as I complete my DPhil through the viscosity of motherhood, but rather a provocation to follow time as it is produced through events instead filling a time perceived as transcendent with work I might continuously churn out. The central question in this event-centered methodology is 'What might be recuperated from interruptions of all kinds—children, catastrophic storms, climate change itself?' The answer comes in the form of a thesis punch drunk from interruption but continuous in its pursuit of eventful time.



**Figure 13.** In transition [photo: author]

"But it's the future I want to know," said Joel.

Randolph shook his head, and his sleepy sky-blue eyes, contemplating Joel, were sober, serious. "Have you never heard what the wise men say: all of the future exists in the past."

- Truman Capote, *Other Voices, Other Rooms* (2004)

## Chapter Three: Germinating futures

“The atmosphere of the Keys is strongly and peculiarly their own. It may be that here, more than in most places, remembrance of the past and intimations of the future are linked with present reality. In bare and jaggedly corroded rock, sculptured with the patterns of the corals, there is the desolation of a dead past...in coral reef and mangrove swamp there are the dimly seen foreshadowings of the future” (Rachel Carson, 1955: 191).

### Mangals

The feel of the ocean in the Keys is overwhelming. It is a presence sensed at every moment: salt on skin and in lungs, the sound of sea birds circling, boats passing, the smell of tides on the breeze, a glimpse of bright blue water. The land is long and low and flat, broken constantly by the ocean, a scattering of small islands with shoals entirely rooted with mangroves. The undeveloped islands are just a fringe of shrubs disrupting the boundary between sea and sky, held above the water by a complex root structure trapping sediments, stabilizing sand and gathering land against the relentless ocean.

Once, southern Florida was bordered on all sides by an immense mangrove forest a hundred miles thick, an impenetrable tangle of leaves, branches, roots and water. Today, this expansive mangal, as the entire plant community is called, has been fractured and reduced significantly by development. Yet in the Keys, mangroves vigorously persist in the margins between human habitation: along highways, behind shopping plazas, in vacant lots, on the very edges of the islands. These salt-tolerant tropical shrubs grow in loose, wet soil that is repeatedly submerged by tides. Mangroves thrive in the calm waters of the Keys, with wave action limited by the extensive reef four miles from shore, stretching the entire length of the archipelago. This mangal coastline provides a nursery area for organisms at the lower end of the food chain, with root systems creating a haven for juvenile fish that move out to the reef as adults (Booker, 2007). Tidal fluctuations prevent competitor plants from surviving in the surging water and flush toxins from the area, allowing young fish to

thrive. Mangroves spread freely and randomly in these intertidal areas. As viviparous plants, they produce seeds that germinate before they detach from the parent, eventually rooting to create a new shrub or join an already formed mangal. These seeds, called propagules, produce their own food via photosynthesis and are dropped into the water by the parent plant and carried by the tide, often distributed over hundreds of miles. When the seed finds fertile soil, its density changes, enabling it to lodge in the mud and root. If this rooting is unsuccessful, it can change density again and float to a more hospitable location in calmer waters. The tangled roots of the resulting plant collect sediments, forming new islands and strengthening established islands against the power of the ocean.



**Figure 14.** Propagules taking root beneath the parent plant [photo: author]

In the Florida Keys, mangroves provide a complex and persistent edging between land and sea. Here, in the “liminal margins of the mobile oceans” (Jones, 2011: 2287), tidal harmonics provoke distinct rhythms through which water and sand meet and mingle and the dynamics of sea level rise unfold. The disappearance of the Keys is complicated by the ambiguity of this tidal zone: a continuously unsettled space that is not only subject to regular rhythms of submergence, including periodic storm surges, but is also complicated by the constant work of mangroves, forming and fortifying land. These littoral edges are affective spaces in which “natural

spatiotemporal processes... trace through materialized social space and time" (Jones, 2011: 2287). In a phenomenal world, sea level rise is felt along this protean border as a continual surging of affective currents more than it is understood through measurements and documentation representing a quantifiable and predictable future. It arrives as an "aesthetic experience... a ghostly spectrality that comes in and out of phase with normalized human spacetime" (Morton, 2013: 169). As such, sea level rise is profoundly germinal, unfolding in the present not just as a tension between land and sea but equally between the felt progress of an event materializing and the unmistakable form of an event that has taken place. What we imagine as *the future* is therefore multiple, uncanny and immanent in the present. *Futures*, in the plural, coexist in a latent state of germination as a multiplicity of felt but pre-culminated potentials.

These visceral forces are understood here through Kathleen Stewart's (2007) idea of 'ordinary affects', a term she uses to include both broadly circulating public feelings as well as the felt currents moving through the intimacies and interconnections of personal lives. Ordinary affects work to shape and transform, they "pick up density and texture as they move through bodies, dreams, dramas, and social worldings of all kinds" (Stewart, 2007: 3). Their intensive and extensive qualities mirror the density and distribution of the mangrove itself, as affects circulate broadly, root in the loose soil of human concerns and collect attention, gaining traction as feelings, encounters or motivations in a sea of events. This germination is akin to what Erin Manning calls preacceleration, "the virtual force of movement's taking form...the feeling of movement's in-gathering, a welling that propels the directionality of how movement moves" (2009: 6). Manning uses preacceleration to theorize relations between bodies, describing how movement arises before we are aware of it, and, in a radical scaling-up of this idea, environmental crises likewise arise before we are aware of them like "messages in bottles from the future" (Morton, 2013: 138). Sea level rise in the Florida

Keys is in a state of preacceleration: it is engendered in the ongoing progress of futures gaining traction, verging on culmination, or dissipating unnoticed. Futures flow into the middle of things, into the space between forms that Manning calls the interval, “a folding into which bodies capitulate, an opening into which we surge” (2009: 21). Events are viviparous, always giving life to impulses, forms, feelings, germinated potentials. While measurements are carried out and policy is put in place, time is being activated as an affective in-gathering, creating the conditions for the form sea level rise will eventually take. In this way, futures are propagules that come to us pre-germinated: imbued with agency, ready to take root, collect sediments and alter the shape of things. Or, failing to root, they may float again carried elsewhere by the tide.



**Figure 15.** An isolated mangrove island, Florida Keys [photo: author]

### {PROPAGULE}

I follow Chris Bergh across the salt marsh, picking a trail through the parched grey remains of tropical hardwood trees. A few hundred feet away a thick mangal blocks our view of the Gulf of Mexico, at our feet new mangroves take root amid the former trees. Chris, director of the Nature Conservancy’s Coastal and Marine Resilience Program, is showing me a “stunning example” of sea level rise near his home on Big Pine Key, so named for its abundant population of slash pines now visibly diminishing with salt water incursion. Six years ago, this area was a stretch of sparse broadleaf and palm forest, midway in ecological succession between the slash pines and the mangrove marshland. Today it is home to nothing but some young mangroves and sparse patches of stunted grasses. As we stand in the marsh, the broadleaf forest is now well behind us, and the pines further still. This whole area had been underwater for an hour or so during the storm surge following Hurricane Wilma in 2005 and the trees were utterly destroyed, choked by salt water. Sea level rise, even at its fastest, is a very slow affair, and Chris, who grew up in Key West, has watched the pine forest slowly receding for years. But the storm surge delivered this bleak future in a matter of hours. “We could actually visualize sea level rise impacts with Hurricane Wilma,” he tells me. Since then, he has been tirelessly lobbying the Monroe County government to enact policies for sea level rise mitigation and preparation. As a conservationist, he is concerned about the type of habitat the current islands will provide for marine life once the land is overtaken by the sea. He wonders about the feasibility of scoring concrete to make it porous enough for sea grasses to affix. He hopes there will be funding available to fill in ditches, swimming pools and canals to prevent them from becoming anaerobic dead zones, and to clean up the Keys’ four landfills. He is less optimistic about the human future, though. “Fifty years from now Big Pine Key will be totally depopulated,” he tells me as we work our way through the skeletal trees.

## Shorelines

The coast is and always has been on the move. It is not a fixed line against which sea level rise clearly occurs, but rather a region of encounter in which the fluctuating relationship between water and land endures as a continuous phenomenon. This process of change can be translated in certain ways through numerical and other representations of tide levels, saltwater incursion and future catastrophes. Yet these “symbols” fail to capture the ever-changing and ongoing involvement between ocean and land that often emerges more clearly in the “indexical signs” (following Peirce, 1955) characteristic of life on the coast, signs which *indicate* rather than represent the event of sea level rise. As the temporalities of the earth come into contact with the temporalities of sensing bodies, time accrues in the shallows of the Florida Keys as boats sit higher against docks, tides creep up through storm drains and traces of climate change “appear as indexical signs, like the footprints of an invisible person walking across the sand” (Morton, 2013: 90). This chapter follows the interplay between these symbols and indices, exploring how representations cannot adequately convey urgency while at the same time a phenomenology of sea level rise remains untethered without these markers of change around which “ordinary affects” (Stewart, 2007) can coalesce. This tension is considered here through Henri Bergson’s work on temporal duration in conjunction with Gaston Bachelard’s contending philosophy, which aims “to arithmetise Bergsonian duration so as to give it more fluidity, more numbers, and also more accuracy in the correspondence the phenomena of thought exhibit between themselves and the quantum characteristics of reality” (2000: 29). In other words, climate change reifies for us in the space between representation and experience, taking form through symbols and indices that reconfigure the space between water and land.

For Bergson, measurements, physical objects, written observations and other materialized effects are weak representations of our world; instead “it is flux, the continuity of transition, it is change itself that is real” (1992: 16). Through Bergson’s concept of duration, time is understood not as a succession of moments but as this ongoing and amorphous creative change. Linear time is an effect of space, an abstraction used to portray movement between fixed points but still unable to capture the dynamism of duration. In this abstracted time, events are understood to exist alongside each other, translating duration into space and setting past, present and future out as a string of extended and discrete moments rather than a heterogeneous and continuous unfolding of difference. Duration can be observed and felt but its essence slips away, defying capture, when described through symbolic representation in space. Bergson presents duration as “a unity resembling that of a phrase in a melody” (2001: 111) in which it is possible to isolate a single note, but only at the risk of losing sight of the entire melody. Sea level rise can be distilled into representative moments only while losing sight of the sea’s unceasing movement. Instead, its melody can be more clearly apprehended through the sensible experience that occurs in the liminal spaces where water encounters land and where affective currents course through lives, imaginations and events.

Bachelard, through his concept of rhythmanalysis, asserts that time is *experienced*, not given, as Bergson seems to suggest, and it is experienced in and through space. Time, rather than a transcendent force of change through which existence unfolds, emerges through our involvement with materials in resonance with human sensibilities. For Bachelard, “our experience of our own past duration is based on real rational axes; without this structure, our duration would collapse” (2000: 52). In other words, the continuous melody of duration could not occur without the eventful notes through which it is composed. “To perceive means to immobilize” Bergson writes

(1991: 208), yet, according to Bachelard, ‘immobilizations’ provide the necessary punctuations through which duration must progress, as the notes of a melody understood through the enduring pattern of the song. Events, unfolding in space, are fixed in resonant sequence in our minds, and “Anticipating the future means fixing its pattern and disregarding the intervals of laziness, fatigue, and leisure; it means isolating its *centres of causalities*” (Bachelard, 2000: 53, original emphasis). The felt reality of sea level rise is articulated and intensified through resonating events that play out in space, so that rhythms *presence* time, they give it materiality. Massey asserts that space does not have to be equated with measurement and stasis; rather it is “the product of interrelations” (2005: 9), a “resonance” (2005: 118) of histories and a bundle of trajectories that generate temporalities particular to a place. Space is a relationship between events, however mundane, “slightly contradicting and colouring each other, either dull or brilliant” (Bachelard, 2000: 149), and it is thus through a consideration of the temporal rhythms of encounter between land and water that sea level rise emerges as an event characterized by time.

For Bergson, duration, and therefore time, resides in the internal ‘affective states’ prior to which perceived things are extended representationally (1991). Through Bergson’s treatment of time, sea level can be understood by way of the affective, sensible and internally felt encounters with the ocean’s ongoing change. For Bachelard, on the other hand, “Life is strictly contemporaneous with material transformations” (2000: 144) making the experience of time external to the body, progressing in, if not limited to, space. Yet, even Bergson agrees that external objects occur in ‘juxtaposition’ with internal qualitative conditions so that anything set out in space also “reverberates and spreads into the depths of consciousness” (Bergson 2001: 126). Forms abstracted in space do not exist in and for themselves, but rather in undeniable tension with Bergson’s affective states, which register our capacities to be moved and influenced by

the things around us and to move those things in turn. It is through affective states that sea level rise is felt yet it is through representative space that it is physically experienced, making sea level rise an ongoing and persistent simultaneity between feeling and form, expressed through a dual refrain of material effects and visceral affects: the symbols and indices of catastrophe. In this way, Bergson's indivisible time and Bachelard's punctuated time, are "co-implicated" (Massey: 2005) in the process of sea level rise: if time is the ongoing-ness of the world then space is the relatedness of the world, and sea level rise manifests as a relationality between physical extension and affective intension, akin to breathing. The potential disappearance of the Florida Keys, then, inhabits a "tensile and expanding present" (Grosz, 2004: 178), a continuous moving juxtaposition of material effects and immaterial affects. Climate change occurs not only through but because of this passage as time germinates in the sensations through which sea level rise is lived and experienced by those along the coastline with the material event of every high tide, every storm surge and every withered broadleaf stump.

Bergson's melody is therefore composed of both material notes and affective notes, with duration as the *unceasingness* of the song, the sum total of the rhythm itself. He locates duration within the 'affective states', but through a modest clarification it could be understood to occur in the center, forming the tensile connective thread between the intuitive, affective states and the spatial, material states. Duration could then be understood as the rhythmic, pulsating tension *between* the internal and the external: not transcendent time, as per Bachelard's critique, but a shoreline of sorts, a tidal resonance between extensions in space and affective intensions. Affect is an unspeakable felt abstraction from duration, while matter is its representable, formed abstraction; the ever-changing liminal zone in which one merges into the other is duration's forward movement. Primacy can therefore not be attributed to either time or

space, but to the resonance between, as the movement of our world manifests in the connective progress of these impulses. As Bergson explains, “whether it is a question of the internal or the external, of ourselves or of things, reality is mobility itself” (Bergson 1992: 150). The existence of all things unfolds through a rhythm *and* a progression, so that time is *punctuated duration* and space is *enduring punctuation*. Rather than the connective feeling between forms, duration is the dynamic average—a shoreline—between forming and sensing; it is transitional, ranging ceaselessly between the internal and the external.

The affective experience of sea level rise may defy representation, yet rhythms in space provide a way to disclose and communicate this phenomenon amidst a world of ongoing qualitative change. By calling attention to the rhythms of disappearance in the Florida Keys, the felt experience of sea level rise emerges through allusion, firstly in that “experiences *point*” (James, 2003: 123) to the sensed transition in between, and secondly that “Affect contaminates empirical space through language” (Massumi, 2002: 62). Duration is not transcendent time, but perhaps it is *transcending* time, in that it is continuously tensing beyond the limits of what currently exists, a continuously changing melody but one that revisits particular themes, phased through each “indexical sign that is a *metonymy*” (Morton, 2013: 78) for climate change. In this way, the future is not laid out before us, but rather time is “activated” (Manning, 2009: 24) through futures rooting in the present and creating the potential for sea level rise to reify and accrue in spaces of human perception. The coastline of the Keys, then, is a region of ‘foreshadowing’, as Rachel Carson asserts, that plays host to multiple potential futures, germinating in the sensory mix of salt air, gently breaking waves, and loose, sandy soil. Lefebvre calls for us to be “more sensitive to times than to spaces... to ‘listen’ to a house, a street, a town, as an audience listens to a symphony” (2004: 22). Following this, the disappearance of the Keys can be teased out through an exploration

of the rhythms of various coastal events, including tidal harmonics, periodic glaciation, frequent hurricanes and disparate human tendencies. Sea level rise is thus Bergsonian in its duration and Bachelardian in its disclosure. It exists as an event-centered continuum, charged with the substance of potential and apprehended through the “rhythmpatterns of timespace” (Jones, 2011: 2300).



**Figure 16.** A former broadleaf forest, Big Pine Key [photo: author]

“The town was a wreck. Whole buildings were wrecked, roofs taken off, and every house had been hit by the water, and furniture everywhere ruined. Trees, grown since the last storm were blown down, and the town presented a desolate appearance.... Water was running over the county road when we went out. Houses were washed ashore, and some were stretched across the road, so we had to slip around as best we could. Shell fish were lying everywhere. Star-fish measuring a foot in width – conchs, crawfish, crabs, and even fish... Houses had been removed from bases, and set on the ground. Other houses had been tipped over, and were resting on another house.”

- account of the 1919 Hurricane, Key West, unknown author (1919)

### {PROPAGULE}

I am digging through the Monroe County Historical Archives in search of hurricane accounts when I discover a folder with a handmade title page reading “Sea Level: Back Under Water Again!” containing a scattered series of articles collected in the 1980s and 1990s by one Gail Swanson and given as a “Gift to the Key West library”. Organized chronologically, one of the first articles, from 1984, references the continual threat of hurricanes in southern Florida and then introduces sea level rise by explaining, “Beyond the shoreline scarps lies a new and less obvious menace” (Achenbach, 1984: 28A). Further into the collection, a 1991 article from the local Keynoter newspaper sketches out this dismal future for the Keys, specifically: “Half of Key Largo is submerged. The Middle Keys are gone...Big Pine Key to Sugarloaf Key is a void. There is no more Everglades. Destruction by a Category 5 hurricane? No. The future, if global warming

continues to push sea levels higher" (Delp, 1991: 1). Other articles predict more severe storms and saltwater incursion into the drinking water aquifer; one calls for a dike system to protect the beaches of Southern Florida (Achenbach, 1984); one demands a reversal in the global warming trend by the year 2000 (Greenhouse Warming, 1989). Sea level rise estimates are wildly alarmist, predicting **27 inches** by **2100** (UPI, 1983), **five to six feet** by **2050** (Schmelz, 1989), and an incredible **11.5 ft** by **2100** ('Rising oceans may flood Glades', 1986), not to mention a rise in average global temperature of up to **ten degrees** by **2020** (Maranto, 1986). The librarian is unable to recall Gail or the circumstances of her gift, yet the specter of disappearance clearly captured her attention in the very early days of both public and scientific interest in the issue. The collection of articles trails off in the mid 1990s, apparently having failed to take root.

## **Immobilizations**

When time is considered past the scope of human habitation, changes in sea level assume a clear rhythm in the Keys. During the Sangamon interglacial period, which ended **100,000 years** ago, the sea level was **25 feet** higher than it is today and the reefs that now form the base of the Florida Keys thrived in the warm tropical waters. During the following Wisconsin ice age the sea level dropped to **350 feet** below its current level and the reefs died off, becoming a high ridge in the open air. Then, around **10,000 years** ago the glaciers began to melt, again causing sea levels to rise at the astounding rate of **1 foot** every **14 years**. This rapid rise slowed after **2,000 years**, with the seas finally settling around present levels **6,000 years** ago (Donaghue, 2011). At this time, the Gulf of Mexico and the Florida Bay began to meet in the low spaces in the ridge and the islands of the Florida Keys were created (Mueller and Winston 2007: 11).

The lines dividing land and sea are understood to shift continuously in the Keys. Key West is home to the longest-running tidal gauge in the US, which has been recording levels continuously since **1846** and has documented an **8.7 inch** increase in sea level in the past **100 years** (Maul and Martin: 1993). A local historian explained to me that the Calusa tribes, whose ancestors inhabited the Keys since around **500AD**, were able to walk out to the reef at low tides to fish. A cluster of pine stumps unearthed in the mangroves off of Key Largo were discovered to be around **160 years** old, having died from saltwater incursion (Alexander: 1974). The islands themselves have been

subject to frequent changes through the years, both from sea level rise and from hurricanes redistributing sand. Often referred to as “fair weather keys”, many former islands now exist only on old charts and maps. One popular dive site, Looe Key, was an island in living memory with a number of old-timers recalling a tree that used to grow in the very center of the island.

The natural sciences can only speculate on the rate at which the Keys will continue to disappear into the ocean. The IPCC (2007) projected a sea level rise of **7-23in (18–59cm)** by the year **2100**, although several recent studies have suggested that these estimates are conservative as calculations are based only on thermal expansion of the ocean and neglect the impact of melting ice sheets (for example: Grinsted et al, 2010; Vermeer and Rahmstorf, 2009). Chris Bergh was part of a group of scientists using LiDAR remote sensing technology to forecast sea level rise in the lower Keys, resulting in an interactive map that allows for detailed assessments of potential property damage. According to the resulting study, a **23in (59cm)** rise in sea level by **2100** would inundate **70%** of total land surface in the lower Keys (Zhang et al, 2011). **Six feet** of sea level rise would flood everything but the highest points of Key West and Key Largo, on either end of the archipelago (Mueller and Winston 2007: 12). The Nature Conservancy has now made these measurements available through an online “Coastal Resilience” platform through which users can simulate storm surges and sea level rise to assess risks to their own property.

Crucial to these concerns are ongoing insurance issues that have plagued island residents since the development boom began in the **1950s** and are contributing to the slow but gradual depopulation of the Keys. To obtain a federally backed mortgage for a house anywhere in Monroe County, encompassing the Keys and the largely unpopulated Everglades National Park, homeowners are required to hold both wind and flood insurance, which can cost up to **\$15,000** per year for houses at the lowest

elevations. In **2002**, the Federal Emergency Management Agency (FEMA), the government body subsidizing insurance in vulnerable coastal areas, threatened to withdraw support to the Keys unless the county began inspecting homes to ensure compliance with regulations prohibiting downstairs enclosures that are vulnerable to storm surges, putting **17,169** households at risk of losing **\$4 billion** worth of insurance (O'Hara, 2012c). Many locals are afraid to even apply for permits to renovate their homes because they could be required to make **tens of thousands of dollars** in modifications before renovations could even begin. Houses are falling into a state of disrepair and are becoming more vulnerable to hurricane damage, to the point that, I was told by Andy Devanas, a senior meteorologist at the National Weather Service in Key West, "these downstairs enclosure issues are the beginning of the end in terms of sea level rise". Insurances challenges, combined with the already high cost of living in the Keys, have already created a "tipping point" for many people, he explained, contributing to the sharp decline in population in the past decade.

Why emphasize these measurements here when they only portray sea level rise as "symbolically represented in space" (Bergson 2001: 104)? These numbers are powerful abstractions expressing the relationship between locals and the changeable coastline, serving not just to quantify sea level rise but to "presence" the future as felt material (Brace and Geoghegan, 2012). Symbols resonate through articles, policy documents and conversations, contributing to an atmosphere of vulnerability in the Keys existing as a "light contact zone that rests on a thin layer of shared public experience" (Stewart, 2007: 52). They are not just tools for communicating change but representations with the potential to resonate and through which depopulation and disappearance can be traced. The local newspaper, the Key West Citizen, introduces numbers into resonance constantly: the critically endangered marsh rabbit lost **48%** of its habitat since **1959** because of sea level rise, only a **few hundred** individuals remain

(O'Hara, 2012b); **2 million** flood insurance policies representing **\$471 billion** in coverage are at risk throughout Florida if FEMA withdraws from the Keys (O'Hara, 2012a); Key West is asking the federal government for **\$1.3 million** in emergency aid to replace sand washed away by Hurricane Isaac (Filosa, 2012). The disappearance of the Florida Keys is an event enframed by numbers, a process that can be traced back to the earliest and most outlandish predictions in Gail Swanson's collection of sea level rise articles. As affective "blocks of space-time" (McCormack, 2010: 215), numbers give substance to futures, fixing them in place, however momentarily, so that "Reality does not stop flickering around our abstract reference points" (Bachelard, 2000: 81). Prices, years, measurements and percentages may fail to capture the felt experience of sea level rise and hurricanes along the vulnerable coastline, but they work to compose the experience by drawing and focusing local attention on the issue.

Measurements provide a material backdrop against and through which the disappearance of the Keys can unfold, in the sense that "Affect brings form qualitatively to life" (Massumi, 2011: 111). Spatial abstractions, through ordinary affects, feed back into and perpetuate change. Numbers are not inflexible forms but are profoundly relational, communicating catastrophe, loss and change as they resonate throughout the Keys, literally *prefiguring* potential relationships between land, sea and coastal inhabitants. Measurements can be considered "intertwined open ended trajectories" (Massey, 2005: 113) that are imbued with virtuality: they are dynamic points around and through which relationships develop. These abstractions contribute to temporalities specific to the disappearance of the Keys: intermittent glaciation, yearly hurricane probabilities, and the rising cost of flood insurance are all rhythms through which futures resound in the Keys. Numbers are thus not simple abstractions in space; they are also refrains in time as they activate futures that begin "in the animated inhabitation of things, not way down stream in the various dreamboats and horror shows that get

moving” (Stewart, 2007: 15-16). Symbols cannot accurately determine when or if the Keys will disappear but, through their capacity to act and be acted upon, to generate affective residues, they are viviparous: germs of the future complicating duration’s shoreline.



**Figure 17.** Saltwater encroachment in the Florida Keys [photo: author]

“And such a scene of desolation as presented itself, was never before witnessed. The lighthouse on Sand Key, nay, the island itself, has entirely disappeared, with every person on it....Trees torn up by the roots lie scattered in every direction while those yet standing are shorn of their limbs blackened and shriveled, as though a withering fire had passed over them. All, all is desolation; and as if to mock the general ruin and misery, the sun is shining brightly and the weather calm and mild, as though a hurricane had never been!”

- a letter from an officer on the US Brig Perry, Key West (The Hurricane at Sea, 1848)

{PROPAGULE}

Annalise Mannix was Emergency Manager for Key West when Hurricane Wilma struck in 2005, bringing an 8ft storm surge that put most of Monroe County under water for an hour and leaving extraordinary damage in its wake. After the storm, it was her job to walk from door to door throughout the city to assess property damage and file an official report with FEMA in order to secure funding for reconstruction. The city was devastated and Annalise was numb from the effort, visiting house after house where families had lost all of their material possessions, the wet and ruined contents of their homes in mountains on their front lawns. But as her work progressed, she discovered even more insidious effects of the storm: people who had heart attacks in the aftermath, elderly neighbors who were sent to the hospital and never came home, outbreaks of MRSA from exposure to raw sewage and respiratory problems from molding structures. I am trying to conduct an interview about sea level rise, an issue for which she is a

committed and persistent advocate, but she keeps directing the conversation back to Hurricane Wilma. "Without a doubt," she tells me, "there are going to be more people who die, and it might not be because of the slow rise but because of emergency events." It's pointless to consider only the material losses, she explains, citing Wilma's widespread structural damage and the 15 deaths it caused throughout the Keys. Disaster management doesn't account for widespread disease and especially the emotional strain that follows a catastrophic hurricane. She tells me, "The stress that people are put under, the depression, is... *phenomenal*." This last word is uttered slowly, with wide eyes.

### **Attention**

Concern for sea level rise in the Keys may be growing, but acknowledgement of the problem was not yet widespread during my fieldwork. One environmental advocate I spoke with estimated that maybe 20-25% of the local population believes the islands will be affected. Another estimated that 5% of residents are actively engaged with sea level rise issues and 5% are climate change deniers, while the majority of the population falls somewhere in the middle. This attitude is especially evident in Key West with its aging, childless and transient demographic in which 70% of the population has moved from elsewhere, according to my contact at the Key West Business Guild. Whatever the degree of local acknowledgement, between hurricane surges, increasing insurance costs and resulting loss of population, the indexical signs of sea level rise are already present in the Keys. Flooding from storms and high tides is considered a separate issue and not generally understood as an effect of sea level rise, despite the fact that an 8.7 inch rise in the past century is ultimately responsible for the severity of these problems in recent years. Between 2000 and 2010 the Keys population dropped 8.3% even while the population in the rest of Florida continued to rise, partially due to the record-breaking 2005 hurricane season, which caused a mass exodus. Experts predict a climate-induced doubling in the frequency of high intensity hurricanes by the end of the 21st century (Bender et al, 2010).

Tom Walker, head of the Keys Aqueduct Authority, who is in charge of the complicated system through which drinking water is piped into the Keys told me that people are already being impacted "quite a bit" by sea level rise. "It's a reality," he

said, “lots of people still don’t get it.” Andy Devanas thinks that sea level rise will really begin to impact property within the next 50 years and the government will do everything it can to protect Key West and Key Largo, which are at higher elevations and also more populated, but the islands in between will be state parks or abandoned property. Chris Bergh believes that in 50 years, the middle Keys will be totally depopulated or else be a frontier-like area with a tiny, committed population. He says any government money to preserve human habitats will go to big population centers like New York and Miami. Jay Gewin, utilities manager for the city of Key West, showed me some photos he had taken of a community called Holly Beach in Louisiana, which was entirely washed away by Hurricane Rita in 2005. Neither government nor private insurers will provide flood insurance for the town anymore, no municipal services are available and federally backed mortgages are out of the question. Only the very wealthy were able to rebuild and he thinks it is likely that communities in the Keys will start to become like Holly Beach, with residency permitted only if homeowners sign a government waiver. One environmentalist I spoke with believes that some wealthy and innovative residents will stick it out as long as they can; she predicts quirky adaptations for dealing with sea level rise and can easily imagine stilt houses out in the water with people boating between, much like the community of Stiltsville, which has existed near Miami since prohibition when it served as a base for rumrunners. Whoever is left will have to deal with little to no municipal services and will have to combat heatstroke, standing water, more mosquitoes and unexpected diseases. They are “watching and waiting,” Tom told me and “things could change overnight”.

Stewart writes of ordinary affects as either a “dragging undertow” or a “sensibility that snaps into place” (2007: 2), and while sea level rise may be the former, hurricanes are clearly the latter, a sensibility regularly snapping into place. I struggle to

remember a single conversation about sea level rise during my fieldwork, even with those involved in mitigation efforts, that did not turn into a conversation about hurricanes. ‘Hurricane bravado’, as it is called, is a well-established lifestyle in the Keys. Even newer arrivals to the islands are well versed in hurricane lore and seem untroubled, and even excited, by the prospect of a catastrophic storm. The trade in stories is constant and it is customary for popular bars to hold ‘hurricane parties’ with locals stocking up on supplies, boarding up their homes and heading out to drink the night away until the danger has passed. Many businesses and organizations in the Keys display photos documenting recent damage from Hurricane Wilma or have on hand a photo album of the destruction, capturing equally their pride in perseverance and their enduring disbelief at the force of the storm. It is understandably difficult to generate concern for an event as slow as sea level rise when a hurricane can deliver the same effects in a matter of hours that melting glaciers and thermal expansion are expected to deliver over the course of a century. I was frequently told by locals that the sea level rise predictions are ‘so far out’ that no one needs to worry about them yet, that ‘we’re not going to be around in 100 years’ and that it’s ‘not anything anyone’s seeing’.



**Figures 18 and 19.** Photo album commemorating Hurricane Wilma, The Island Tiki Bar, Marathon, Florida [photos: author]

Time is drawn out through our attention to the things around us. It is a path traced through events of relevance rather than a neat succession of moments, uniform

in length and consistency. Hurricanes are a reinforced material reality in the Keys, continually affecting local subjectivities as well as physical landscapes and, as such, they are a punctuating force generating a particular experience of time. In this way, time can be understood as an effect of our attention ranging over specific things to which we are drawn out of alarm, recognition or habit, and is “relative to the extent of the field which our attention to life can embrace” (Bergson, 1992: 152). An absence of concern for sea level rise does not mean that its effects aren’t being felt, but rather that it has not captured the widespread attention of locals because hurricanes are a more present threat to the islands’ habitability and therefore more impressive markers of change and generators of time. In certain areas of Key West, salt water has started creeping out of storm drains into the streets during high tide and people are unwittingly driving through the puddles, causing their cars to rust more quickly. The problem is so pronounced that Key West police and emergency vehicles are no longer eligible for warranty. Despite this rather obvious evidence of rising seas, there is a surprising lack of local engagement with the issue. Climate change and hurricanes therefore provide competing indices: sea level rise is present and it is felt, but it suffers from inattention because the prospect of a rusty car is less menacing than the sudden destruction of a home by hurricane force winds. Bergson might describe this as “the presence of a thing or an order which does not interest us, which blunts our effort or attention; it is our disappointment being expressed when we call this presence absence” (1992: 64). Sea level rise may be occurring, but its indices are not particularly engaging and it is thus absent from a majority of local attentions. Potential futures become apparent more through the “degree of our *attention to life*” (Bergson, 1991: 14, original emphasis) than to measurable facts or even necessarily the felt experience of saltwater incursion.

According to Lefebvre, and following Bachelard, we apprehend time through lived experiences in which we attend to the rhythms of the events around us. Hurricane

emergencies are not only a more palpable punctuation of duration in the Keys, but also provide a rhythm through which island life is narrated and animated. To a certain extent, hurricanes *define* life in the Keys, creating a particular felt materiality based equally around vulnerability and temerity. When hurricane season arrives in June, all eyes turn to the weather reports as locals speculate on whether or not this year will bring ‘the big one’, inevitably referring to the intensely powerful Labor Day Hurricane of 1935. If sea level rise blunts local efforts of attention then hurricane season sharpens this attention markedly. As Bachelard explains, “If we believe in the permanence of things, it means that we always open our eyes at the same phase of their rhythm” (2000: 78), a process he refers to as “stroboscopy”, through which time is composed through our repeated attention to particular things, situations and events. In the Florida Keys, it is less easy to give oneself over to sea level rise, with its more dispersed and less regular rhythm, than it is to give oneself over to hurricanes as recurrent events in which locals are well-versed and well-experienced, or, as Bachelard asserts, hurricanes generate “time that has been useful and fruitful to us” (2000: 50-51). Hurricanes, as described by Andy Devanas, are “unpredictable systems with very predictable impacts”, bringing sudden but expected and pre-experienced effects, including storm surges and wind damage. Sea level rise, on the other hand, is still an imaginary frontier, a field of possibility rather than a well-practiced catastrophe. A mental leap, rather than a simple effort of attention is required to envisage the ways it might play out prior to the point when the ocean begins lapping against people’s homes, by which time the Keys will have already become uninhabitable because of infrastructural failures. Sea level rise, in other words, is not yet a stroboscopic event: it is not yet eye-opening in the same way as hurricanes and not until its effects begin to take on a more distinct rhythm will this more prolonged and less understood event be thoroughly attended to in the Keys.

Attention resides in the body, which, for Bergson, is “an ever advancing boundary between the future and the past” (1991: 78) and for Lefebvre is also a “metronome” (2004: 19) through which rhythm becomes a tool for analyzing the world. It is through rhythms that we navigate, picking a trail from event to event as they resonate between past experience and future potential. Rhythms laid out in the past may falter, failing to take root, or they may be picked up by the present, extending into the future as a space of expectation created by the rhythm’s potential continuation. The present is the wavering tension between these rhythms, a region in which what happens now amplifies the past and anticipates the future. As Bachelard explains, time “has a dialectical support in the present; the past can only be brought back to life by linking it firmly to an affective theme that is necessarily present” (2000: 50-51). Hurricanes in the Keys are a threat with more presence because they are a threat with more resonance, more felt history and future possibility. The present, then, is an *attention* through which what comes before is intensified by what we may expect to come next; through which change expands into the prior and opens up the field of expectation that is the future. Time is an enduring affective theme, a continuation perpetuated through a “rippling of affectivity” (Bachelard, 2000: 51) in which past and future are drawn together through and because of the attentive present. Duration is the event of rhythm’s continuation, it *is* the attentive present, the ongoing movement of the world’s oscillation between extension in space and affective intension.

{PROPAGULE}

“The island looked like the abandoned bed of a river where the sea had swept it,” Ernest Hemingway (1935) wrote after the Labor Day Hurricane. “When we reached Lower Matecumbe there were bodies floating in the ferry slip... You found them everywhere and in the sun all of them were beginning to be too big for their blue jeans and jackets.” The storm was a rare category 5 hurricane: it was small, tightly wound, incredibly powerful and considered to be the strongest storm ever to make landfall in the US. An 18ft storm surge washed over islands no higher than 8ft, flattening everything in its path. The upper Keys were sparsely populated at the time but most structures in the 25-mile stretch between Long Key and Plantation Key simply disappeared. The stories are dramatic: survivors say the sky was pitch black and they could hear nothing but the terrible shrieking of the wind, gusting up to 200 mph. Entire families sheltering

in their homes were swept away. A few managed to strap themselves to palm trees with their own belts; those who survived were stripped naked and covered in splinters from flying debris. There are stories of people clinging to loved ones who were swept out of their arms during the surge, never to be seen again. As dawn came the next day, dazed survivors wandered around in the still pelting rain, unable to comprehend the destruction. The layer of sand that once covered the islands was blown away, exposing the coral bedrock below. Bodies floated in the sea and were tangled in the mangroves. The few survivors were stranded for days before rescuers, including Hemingway, finally arrived and the swollen bodies of the dead were burned on huge funeral pyres. Constant pillars of black smoke stretched into the clear blue sky for days; no birds were seen for weeks.

“Wreckage broke holes in the wall and soon the door was pushed in... We had to leave it. The water was then five feet high and I held my wife and baby. The water continued to rise and soon it was seven feet deep. I couldn't stand up in it. My wife and baby held to me and I heard my baby begging me to hold her tight. But as we tossed around in the water they were torn away from me. I went up and down a thousand times. My clothes were all ripped off. I was buried by wreckage several times. I was swept against a tree and held there until the water went down.”

- Captain John Russell on the Labor Day Hurricane of 1935  
(Brown, 1975)

## **Surges**

The rhythms of tropical storms provide a steady and consistent backdrop to life in the Keys, bringing storm surges that can inundate entire islands in an overwhelming rush of water. Hurricane Wilma, having occurred so recently, was still intensely resonating during my fieldwork. Wilma was unique in that it bypassed as a relatively weak category 2 storm, never venturing closer than 60 miles to the Keys, but was followed several hours later by a catastrophic 8ft storm surge. Meteorologists described it as a ‘perfect storm’ because it travelled from west to east all along the Keys, affecting every single island on the way. Most often, a hurricane will travel south to north with the eye passing over and causing damage in a very specific area, like 1960’s Hurricane Donna and the Labor Day Hurricane which devastated Marathon and Long Key, respectively, but were barely felt in Key West. Adding to these perfect storm conditions, Wilma’s surge coincided with a full moon high tide when sea levels were already at their highest. Fortunately, the surge occurred during daylight hours and without

corresponding hurricane winds, otherwise, I was told by the former Key West Emergency Manager, the death toll would have been much greater.

During the surge, which only lasted an hour, 70% of Key West was under water, with much of the island at only 2-3 feet above sea level. The other islands, with the exception of Key Largo, were completely overtaken by the ocean and many homes suffered extensive damage, flooded with three feet of septic water from overflowing sewers. I was told stories of water gushing in through electrical outlets; houses filling up with dead fish and seaweed; neighbors floating in armchairs in their living rooms; people risking their lives to rescue trapped pets. In the aftermath, many homes had to be completely demolished because of black mold and residents were forced to live in temporary trailers provided by FEMA for up to two years. Many who remained had to take on extra jobs, borrow money from friends and family and take out sizeable bank loans to recoup. Trees and grass were dead, leaving the islands brown and dismal, and along the roadsides debris and appliances from ruined homes were piled for months waiting to be picked up and trucked to landfills in mainland Florida. Everyone was visibly depressed after Wilma, I was told, and many people moved out of the Keys afterwards, including an estimated 3,000 individuals from Key West. Jimmy Weekly, a former five-term mayor of Key West whose family has lived in the city for four generations, told me that Wilma was by far the most damaging hurricane he's ever seen and since 2005 people have finally started taking hurricanes seriously again. Wilma transformed sea level rise into an embodied experience for locals; in the space of an hour the islands and their inhabitants became tangibly vulnerable to climate change.

During these periodic storm surges, duration's shoreline is overcome by an upwelling of affect, even as the physical shoreline is overcome by water. Bergson and Bachelard agree that existence progresses through wave motion, though the particulars of this oscillation differ between the two philosophers. For Bergson, our perception

surges alternately between interior affective states and exterior representative states, with passage back and forth progressing along “pure duration, of which the flow is continuous and in which we pass insensibly from one state to another” (1991: 186). For Bachelard, existence wavers between engagement and disengagement, through periods of activity and inactivity. He refers to this as “the interplay of assimilation and disassimilation”, maintaining “life must consequently pass through the medium of wave energy” (Bachelard, 2000: 144). Bachelard attributes greater importance to the material crests of the waves, to events extended in space, while Bergson attributes greater importance to the temporal, and opposite, crest, occurring in the ‘affective states’. Still, for both, our understanding of time develops in the resonance between the swells. Critically, however, for Bergson perception occurs at the “point of confluence” (1991: 127-8) between internal memories and objects extended in space, the middle region between each wave’s surge. This perception is our attention, the dynamic average between materials and sensations through which we attend to the world. The shoreline emerges through “this wavering of time” (Bachelard, 2000: 50-51), in resonance between the alternating crests.

Some of the strongest proponents of sea level rise mitigation, including Chris Bergh, Andy Devanas and Annalise Mannix, who all serve on the Monroe County Climate Change Advisory Committee (CCAC), were spurred into action by the inundation brought by Hurricane Wilma. Chris’s tireless awareness efforts started in the wake of the storm, eventually leading to the formation of the county’s Green Initiative Task Force, a precursor to the CCAC, in 2008. For Chris, the storm surge, which found him wading through chest-deep water at his parents’ house in Key West, was a transformative event, followed shortly by the release of Al Gore’s climate change documentary, *An Inconvenient Truth*, in 2006, and then the IPCC’s Fourth Assessment Report in 2007. An embodied experience, a poignant documentary, an alarming policy

document: “That’s what did it for me”, Chris explained. While most Keys residents still seem unworried about the prospect of permanent inundation, a critical few were affected to the point of action. It was therefore Wilma’s storm surge that initiated the process of county-wide sea level rise mitigation and preparation policy that is being drafted at the time of writing: a surging of water, bringing a groundswell of attention to the issue of sea level rise.

Another surge, which could come in the form of an upwelling of the ocean, or could come as a sudden denial of subsidized insurance, or even a precipitous failure of infrastructure, might carry the tide of local attention further, generating a “sensibility that snaps into place” (Stewart, 2007: 2). In any of these ways and others, the Keys could become rapidly uninhabitable, with the islands and their residents quickly succumbing to the realities of rising seas. Or perhaps the issue will continue to float on the tide as a “a dragging undertow” (Stewart, 2007: 2), with locals proceeding to drive through saltwater puddles, starting to notice boats sitting higher against docks, and facing ongoing trouble with renovation permits, prolonging the gradual depopulation of the Keys that has already begun. These scenarios are all futures in preacceleration, germinating in the “opening into which we surge” (Manning, 2009: 21). Futures are carried and scattered on surges, of water or of ordinary affects, emerging through a slow and increasing resonance, a sense that things have changed, or a sudden upwelling of shock, surprise, convergence, surging into the transition between now and then. As Stewart explains, “Ordinary affect is a surging, a rubbing, a connection of some kind that has an impact. It’s transpersonal or prepersonal... about bodies literally affecting one another and generating intensities: human bodies, discursive bodies, bodies of thought, bodies of water” (Stewart, 2007: 128). Surges stretch the boundaries of potential even as they alter the boundary between land and sea.

{PROPAGULE}

I grew up in a seaside town on a sizeable barrier island off the south shore of New York's Long Island, spending much of my childhood along the coast. The summers brought families escaping the city, the winters strong winds and high surf. At low tide we could walk for miles, collecting shells and beach glass, and digging for crabs at the water's edge. The ocean brought many surprises through the years: a huge abandoned fishing boat; a salt-crusted computer; a rotting cow's head; beached whales; sometimes an infestation of jellyfish or sea worms. One summer the beach was closed for months because medical waste from Staten Island was washing up on the shore. One winter a group of seals arrived and we would go down to the beach to climb out on the jetty and watch them watching us. In 1985 we had to evacuate for Hurricane Gloria, returning to find that the storm surge had carried the ocean all the way down our street, depositing a thick layer of seaweed nearly at our door. Barrier islands naturally drift and the edges of the town were constantly shifting, causing frantic efforts to shore up the coastline. Every spring docks were extended to reach the water again after the winter tides had piled sand underneath. Several summers were overtaken by 'beach nourishment' efforts: a huge, rusty pipe, several feet in diameter, stretched the length of the beach, with barges offshore, belonging to the Army Corps of Engineers, dredging sand up from the bottom of the ocean to fill in the disappearing beaches. The ocean was a constant but changing presence: captivating and distressing in equal measure.

*"Outside, in the blackness of the night, the hurricane raged. The sounds generated by the wind were virtually indescribable. Under the ripping, tearing, screaming, banshee wailing there sounded a steady, ferocious drumming as of the hooves of a thousand horses pounding over a wooden bridge. Above that rose the contrapuntal dissonance of a mighty orchestration which sometimes soared in a wild harmony above the chaotic ruin being wreaked on earth, only to degenerate into a jumble of shrieks, groans, mutterings, moans and screams, punctuated by a trip-hammer thumping and pounding that subsided but never quite desisted either."*

- 'Hurricane Donna in the Florida Keys' (1960)

## **Propagules**

The Florida Keys underwent a period of rapid development that began in the post-war 1950s and continued in several waves, with the county population rapidly growing from only 14,000 individuals in 1940 to 80,000 in 1990. A place that was so recently and easily populated, Chris Bergh explained to me, can be depopulated with equal ease, and the loss, from a human perspective, is merely an inconvenience. "This isn't Bangladesh," he told me: the 73,000 people inhabiting the Keys today, most of whom have superficial roots in the area, can be relocated with relative simplicity. Of all those I met in the Keys, people like Chris who have grown up in the islands and are raising their own families there were an exception; a vast majority of residents seem to be vacationers who never left. Chris is more concerned about the critically endangered

wildlife, including the tiny Keys deer, endemic to only a few of the southernmost islands, that will be lost forever in the inundation. The specific ways in which the “radical trauma” (Morton, 2013: 8) of this future will unfold, however, are still unclear, as the Keys’ disappearance plays out through a dynamic counterpoint between rapid destruction by hurricanes and gradual abandonment from sea level rise. As such, the Keys find themselves at the convergence of multiple resonating potentials, such that each “event is a vibration with an infinity of harmonics” (Deleuze, 1993: 77), some of which have a more regular rhythm and others which are more rhythmically prolonged.

The shoreline of the Keys emerges through this ‘symphony’ of disappearance, to borrow a phrase from Lefebvre (2004: 22), as a shifting region of encounter between land and water as much as between felt abstractions and formed abstractions. To quote the poetics of Rachel Carson at length:

The edge of the sea is a strange and beautiful place. All through the long history of Earth it has been an area of unrest where waves have broken heavily against the land, where the tides have pressed forward over the continents, receded, and then returned. For no two successive days is the shoreline precisely the same. Not only do the tides advance and retreat in their eternal rhythms, but the level of the sea itself is never at rest. It rises or falls as the glaciers melt or grow, as the floor of the deep ocean basins shifts under its increasing load of sediments, or as the earth’s crust along the continental margins warps up or down in adjustment to strain and tension. Today a little more land may belong to the sea, tomorrow a little less. Always the edge of the sea remains an elusive and indefinable boundary (1955: 1).

As a changing border in which land and water cannot be neatly disentangled, the shoreline is also as a tensile edging between felt experience and formed events, through which sea level rise is taking root in the affective spaces between things as futures surge in the transition. Along this twofold shoreline, sea level rise is a germinal event, theorized here through what Stewart calls “a speculative and concrete attunement... something that takes off with the potential trajectories in which it finds itself in the middle” (2007: 128). This durational shoreline is planted with and formed through events, measurements, stories, remembered experiences and other germs of the

future that are, even as representations, profoundly relational and inhabited by affect. Thus, while it is certainly possible to discuss the abstract ways it is developing out in the present, sea level rise remains “an uninterrupted continuity of unforeseeable novelty” (Bergson, 1992: 35).

In the Keys, the shoreline exists as a turbulent nexus where vertical rise, hurricane threats and financial concerns meet and mingle, coming together to “emit spacetime” (Morton, 2013: 90) in the form of climate change. The shoreline is entangled with the ordinary affects of disappearance and inundation, causing the lived experience of sea level rise to “grow at its edges” (James, 2003: 45), much like the dense and persistent mangals holding the islands, however hopelessly, against the encroaching ocean. It is in this liminal region that mangroves thrive as dwellers of this edge, requiring both the ocean and the land for their proliferation. In this way, they are adaptable but also profoundly generative, building land and providing fertile, protected habitats in their root structures that allow reef ecosystems to thrive. Preserved in Florida under the Mangrove Protection Act of 1985, they are beneficial to human environments as well: while mangroves complicate the physical shape of the shoreline, they also complicate the event of a storm surge by blocking water and “attenuating” the effects of the flood, a phenomenon that occurred during Hurricane Wilma, reducing the impact to mangrove-covered areas of the Keys (Zhang et al, 2012). These persistent plants may also mitigate the effects of sea level rise in areas where mangals are already prevalent, as the plant community may be able to grow quickly enough to keep up with rising seas, producing new land to replace that which is inundated (Gedan et al, 2011).

Viviparous worlds grow around us by way of our resonating attention to particular things, situations, and events through which futures take root. Each distilled effort of attention is a propagule, a germinating future, but also a note in an ongoing melody through which this future may be refrained and intensified. While affective

currents drift widely and unexpectedly, this chapter has attended to the *intensive* moments born at this edge where the melody verges on continuation and futures germinate in the tension between feeling and form as much as in the spaces between land and water. The conceptual 'propagules' outlined throughout are likewise germs of the future: they are distillations of my own sensible experience of climate, a shoreline traced through the prolonged event of fieldwork and beyond, through encounters with the ocean's ever-changing relationship with the land. Our experience of time is therefore apprehended through the rhythms around us, a phenomenon in which ongoing patterns attract, but are also created by, our efforts of attention. Our attention is this resonant tracing, an ongoing duration, followed through events with internal and external, and thus temporal and spatial, significance. Events are propagules, distilled attentions that contain within them the potential to grow and spread.

He thought of how some men feared being out of sight of land in a small boat and knew they were right in the months of sudden bad weather. But now they were in hurricane months and, when there are no hurricanes, the weather of hurricane months is the best of all year.

If there is a hurricane you always see the signs of it in the sky for days ahead, if you are at sea. They do not see it ashore because they do not know what to look for, he thought. The land must make a difference too, in the shape of the clouds. But we have no hurricane coming now.

He looked at the sky and saw the white cumulus built like friendly piles of ice cream and high above were the thin feathers of the cirrus against the high September sky."

- From *The Old Man and the Sea*, Ernest Hemingway (2014)

## Chapter Four: Tracking the storm

### **August 27, 1965**

A tropical depression develops east of the Leeward Islands. The system strengthens into a tropical storm by the end of the day, moving slowly northwest. It is named Betsy.

### **August 28, 1965**

Tropical Storm Betsy continues to strengthen as it moves along the Lesser Antilles.

### **August 29, 1965**

At 200 miles north of Puerto Rico, Betsy briefly intensifies into a hurricane but then begins to stall and lose energy.

### **August 30, 1965**

Betsy, strengthening again into a weak category 1 storm, appears to be heading north and dissipating.

### **September 1, 1965**

Hurricane Betsy suddenly reverses south, makes a slow, lingering loop north of Puerto Rico and heads back southwest toward Hispaniola.

### **September 2, 1965**

Betsy arcs toward the northwest, aiming for the Bahamas, and intensifies into a category 3 storm.

### **September 3, 1965**

Betsy continues to parallel the Bahamas as a category 3 storm, taking aim for the coast of the Carolinas. By the end of the day she has reached category 4 strength.

### **September 4, 1965**

A high pressure system heading south blocks Betsy's progress and her speed slows.

### **September 5, 1965**

Forced by the high pressure system, Betsy turns another loop, now heading south, back towards the Bahamas and southern Florida, and weakening into a category 3 storm.

### **September 6, 1965**

Betsy briefly slows to a category 2 storm, then regains strength, heading into the Bahamas as a category 3.

**September 7, 1965**

Betsy makes landfall in the Bahamas as a category 3 storm, causing \$14 million in damage. The storm continues moving southwest towards the Florida Keys.

**September 8, 1965**

Betsy's eye passes over Key Largo. It is exceptionally large at 40 miles wide and causes a six-foot storm surge with extensive flooding and wind damage. She continues into the Gulf of Mexico.

**September 9, 1965**

Betsy moves rapidly through the Gulf of Mexico, intensifying into a category 4 storm with winds up to 155mph. She makes landfall in Grand Isle, Louisiana where nearly every building is destroyed.

**September 10, 1965**

In the early hours of the morning, Hurricane Betsy moves up the Mississippi River as a category 3 storm, causing the levees in New Orleans to fail in the Lower Ninth Ward, flooding 164,000 homes.

**September 11, 1965**

Betsy weakens into an extratropical storm as she turns northeast over Arkansas.

**September 12, 1965**

Betsy dies out, turning into a region of scattered rain over Indiana and Ohio.

**Atmospheric inflection**

A hurricane is a *meteorological disturbance* of massive proportions, extending from the surface of the ocean up through the entire depth of the troposphere and into the lower stratosphere to a height of up to 11 miles (Emanuel, 2005: 7). An average hurricane, drawing heat from the ocean, releases the energetic equivalent of a 10-megaton nuclear bomb every 20 minutes as it moves across the water (noaa.gov). Yet hurricanes extend through human history and consciousness as well, back to the Pre-Columbian Taino people of the Caribbean to whom Juracán was the formidable god of

chaos and disorder. In 2012, Juracán materialized as ‘Superstorm’ Sandy, a catastrophic hurricane that claimed 253 lives, tens of thousands of homes, 250,000 cars and crippled NY transportation and communication systems for days. Hurricane Sandy sent East Coast residents reeling as the storm was tracked northward over the Atlantic with surprising accuracy and made landfall on the New Jersey coast as an *affective disturbance* of massive proportions, causing widespread panic and months of agonizing clean up for residents of the greater New York area, including my own family and friends in Long Beach, NY.



**Figure 20.** The erratic track of Hurricane Betsy [image: noaa.gov]

The meteorological atmosphere in which hurricanes form is a material field of substantial mass through which the energy of the sun is dispersed and mixed, setting enormous forces in motion and generating the weather that continuously affects life on Earth. We live embedded in this mixture of gases and temperatures, energies in turbulence with no fixed shape. According to Ingold, we “dwell within a weather-world in which every being is destined to combine wind, rain, sunshine, and earth in the continuation of its own existence” (2007: S20). The atmosphere is a medium through which we experience the world and with which we are ceaselessly “commingling” (Ingold, 2007). McCormack (2008) has drawn a connection between the measurable meteorological atmosphere and the “atmosphere in an affective sense:

something distributed yet palpable, a quality of environmental immersion that registers in and through sensing bodies while also remaining diffuse, in the air, ethereal" (2008: 413). Atmospheres, in both senses, are spaces in which things are continuously taking and losing form; not empty spaces to be filled with materials but the energies of those turbulent materials themselves. As "material, physiological things... affects have an energetic dimension" (Brennan 2004: 6); like molecules of air, they exist in a field of turbulent and combinant forces, an atmosphere through which "Modes of existence accrue, circulate, sediment, unfold, and go flat" (Stewart 2011: 446). Atmospheric energies, then, can be understood to include both the power of the wind and the shock of a home destroyed, both energies channeled through sensing bodies in the same environment. This understanding allows us to reconceptualize the atmosphere as a single ambient field, that "amasses the resonance of things" (Stewart 2007: 12), from which arise both physical and metaphysical forms. The meteorological atmosphere can be understood a material effect that continues into and through human subjects, blending into a sensory field in which felt energies likewise combine and dissipate. The affective atmosphere, as a field of intensity, is not only the analog of air but inseparable from it.

Deleuze, through his study of the Baroque, offers a way to explore these two apparent atmospheres as a complex duality inhabiting "one and the same world" (1993: 119). The Baroque arts celebrate the infinite potential of extension and are characterized by ornate embellishments or proliferations, reminiscent of cloud patterns formed by atmospheric turbulence. Inspired by Baroque architecture, Deleuze asserts that the world can be divided into two conceptual floors: an upper metaphysical floor that represents human perception, and a lower physical floor that represents the material world as it is commonly understood. Events in the two floors manifest as dual trajectories of a single impulse that fold in either direction, proliferating as "two infinite

sets whereby one never rejoins the other” (Deleuze 1993: 28). Within this extended atmosphere, hurricanes exist as binary vectors, tracing paths at once through the meteorological atmosphere and through the more visceral atmosphere of human sensibilities. A hurricane is, then, a series of atmospheric pleats, unfolding through physical effects and transpersonal affects in infinite extension. It forms over the Atlantic, traces a path across the water, makes landfall, destroys homes. Yet it is also a tension that develops each summer in the Florida Keys when the ocean reaches 81°F. It is a felt need to stockpile bottled water and batteries, a decision to invest in higher quality storm shutters, or an uncontrollable flood of tears on the phone to FEMA. It is an event that can be tracked both externally and internally, through an atmosphere understood as one and the same generative environment in extension in two directions.



**Figure 21.** (left) Rosario Chapel in Santo Domingo Church, Puebla, Mexico, [image: Maurice Marcellin<sup>20</sup>]; **Figure 22.** (right) cloud pattern known as a ‘Karman vortex street’ [image: NASA<sup>21</sup>]

The folding that Deleuze describes follows a line of inflection as “a virtuality that never stops dividing itself” (Deleuze, 1993: 35), combining “Body and universe, entwined in mutual concavity/convexity, floating/falling, folding/unfolding” (Grosz,

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<sup>21</sup> available under a Creative Commons Attribution-Noncommercial license.

2008: 16). The hurricane actualizes on this inflected line between form and perception, through the atmospheric tension between internality and externality. Folding follows a spiral repetition in which “each turn of the spiral enters into a new and distinctive assemblage” (Bennett, 2001: 40). This vortical line of inflection is a continuous region of proliferating change so that at every moment the hurricane is at once a singularity but also a completely new hurricane at a slightly different location and strength, moving in a slightly different direction, affecting new things, creating new potentials and forming new folds. The line of inflection progresses as an ongoing series of coiled potential, spiraling back in a way that is at once consistent but also profoundly new and unpredictable, echoing the vortical structure of a hurricane itself. A hurricane is, as Deleuze writes, “a turbulence that is never produced on its own, whose spiral follows a fractal mode by which new turbulences are inserted between the initial ones” (Deleuze, 1993: 17). Hurricanes continue to proliferate along this line, through a “torsion that constitutes the fold of the world and of the soul” (Deleuze, 1993: 26), even before we are aware the storm is developing and even after the catastrophe has apparently ended.

During my fieldwork in the Florida Keys, I was frequently told that hurricanes each have their own personality. While some storms cause wind damage others cause flooding and storm surges, others both. It is impossible to anticipate what any one hurricane will do, as one meteorologist at Key West National Weather Service explained, “They're like snowflakes in a way. No two are alike” (Iannotta, 2005). As such, the paths they trace across the ocean are dependent on a chain of singular events requiring specific conditions and alignments of air, ocean and land through which this “cyclonic heat engine” (Protevi, 2009: 172) is able to develop. A hurricane moves as a series of atmospheric foldings, from singularity to singularity, twisting air, water and heat into a chain made of “droplets of an event” (Deleuze, 1993: 64). Protevi writes of

Hurricane Katrina in 2005 as a series of diverse events that included the incidence of slavery in the Louisiana, the formation of the Mississippi River, as well as the ideal meteorological conditions in which oceans and winds, “converge certain points, triggering singularities and forming turbulences” (2009: 127). The atmosphere is “a set of dynamic and kinetic affects... a field of virtual movement from which certain bodies, including wind, are always in the process of actualizing” (McCormack, 2008: 418-19) and within which the track and particularly the strength of a hurricane remain difficult to anticipate. The atmosphere can thus be understood as what Deleuze and Guattari call ‘smooth space’, “filled by events or haecceities, far more than by formed and perceived things” (1987: 479). Unlike striated space, which is partitioned in such a way that movement is blocked, smooth space is generative of deterritorialized vectors that are able to move freely and spontaneously in any direction. Thus, a hurricane lurches erratically through the Caribbean, defying instrumentation, rapidly intensifying or suddenly weakened by a contrary wind shear. Thus, the shock of house washing down stream in flash flood enables the recovery of lost love as it did for a Vermont man who was reunited with a former fiancé after being featured on the national news following Hurricane Irene. The storm is still proliferating in smooth space, both internally and externally, as homes are rebuilt, lives are reorganized and shorelines are fortified against further catastrophe.

This inherent and ongoing novelty of a storm event complicates the idea of tracking as a hurricane follows the edge along which change occurs. Hurricanes, with their vortical structures, are the essence of nomadism, as Deleuze and Guattari associate “speed; vortical or swirling” (1987: 381) with nomad bodies. Meteorological forecasting of an absolute singularity can necessarily only be partial as “we have to deal with chaotic trajectories in a flow that is also chaotic” (Emanuel 2005: 237). Deleuze and Guattari suggest a method of following that remains more faithful to this

novelty, through a rhizomatic 'mapping' of an event rather than a 'tracing' which is understood to "pre-exist the act of drawing" (1987: xvi). A map progresses through smooth space; it "must be produced, constructed, a map that is always detachable, connectable, reversible, modifiable, and has multiple entryways and exits and its own lines of flight" (1987: 21). However, 'tracking', despite its implications as an act of uncomplicated following as per the definition "To trace the course or movements of" (OED, 2013), is a crucial word to retain and even advance here because of its use by climate scientists to describe their efforts to apprehend and understand hurricanes. For recreational and professional meteorologists alike, storm tracking is more an art of immersion than an act following. For storm chasers, in particular, it is an exercise in "seeking out the drama as the awesomeness of the sky unfolds" (Windsor, 2010: 5), and embracing the idea that "Strange twists and turns occur on the storm chase road that can take one anywhere" (Windsor, 2010: 7). Likewise, tracking, from an ecological perspective, is an art of observing environmental signs in order to gain an understanding of the landscape and the movement of creatures therein. Tracking, from these perspectives, is thus an act of apprehension as much as it is an act of following; it is an attentive being-with rather than an accurate tracing of a limited event, so that "Tracking an animal is opening the door to the life of that animal... The longer you follow the animal, the deeper you enter into a perceptual relationship with its life" (Rezendes, 1999: 15). Tracking is an experience through which "Sensing is a topological activity" (Manning, 2009: 53), in that our senses continuously transpose and combine the material atmosphere in which we are embedded into the affective atmosphere through which we perceive. Located between "the putative profundity of the self" and "the superficiality of external encounter" (Massumi, 2002: 59), our senses are a region of inflection between the meteorological atmosphere and the corresponding affective atmosphere so that we sense *along* the line of inflection

between the two. Tracking thus involves a deliberate effort of “commingling” (Ingold, 2005), sustained over a certain period of time, until we part ways with the creature tracked. Yet, while the tracking itself may be a limited event, the life of the creature is not: storm tracking does not end in capture but follows a hurricane’s dynamic progress along a nomad line that is not understood to end when our attention flags. We enter into a temporary perceptual relationship with a hurricane, a torsion between tracker and trackee along a line of inflection that remains open to potential.

### **Through the lower floor**

“Think of the storm roaming the sky uneasily  
like a dog looking for a place to sleep in,  
listen to it growling.”

- From ‘Little Exercise’ by Elizabeth Bishop (1989)

Life on earth is supported and protected by a gaseous atmosphere that is divided into five layers with different qualities. The troposphere, the layer closest to earth, extends as far as 12 miles up near the tropics. It contains 99% of the atmosphere’s water vapor and is bordered at its upper limits by the tropopause, a barrier through which most rising air currents cannot pass. It is within this layer that weather occurs and in which air convection and precipitation work to cleanse the atmosphere. Hurricanes begin here as tropical storms, usually originating in the Atlantic south of the Cape Verde islands or in the warm waters of the Caribbean (Jordan, 2007: 17). They most often begin as ‘easterly waves’, up to 1000 miles wide, caused by the intense desert heat of equatorial Africa moving off the west coast at roughly one wave every three days. They affect the distribution of clouds over the Atlantic, often creating heavy rain and thunderstorms caused by the rapid rising of warm, moist air that releases heat energy as water vapor condenses into clouds and rain (Drye, 2002: 79). The heat from the top of a thunderstorm is usually carried away by sudden wind shears, but when no wind shear is present, or another atmospheric factor serves as a trigger,

these disorganized storms can evolve into a system of closed circulation known as a tropical depression. Tropical cyclones require a perfect but delicate combination of thermodynamic disequilibrium and spin caused by the Coriolis force of the earth's rotation and only around 85 develop globally each year, of which roughly half go on to become full-fledged hurricanes, not all of which make landfall. When the speed of circulation in a tropical depression increases to 39 mph or more, the system is considered a tropical storm. As more air rushes into the vacuum created by the low pressure of this circulation, the center rotates faster and become more distinct, forming an 'eye'. When winds reach speeds of at least 74 mph, a tropical storm officially becomes a hurricane. The spiral vortex around which a hurricane rotates forms a thick ring of clouds. This eyewall, on average 10 miles high with snow and ice at the top, produces the strongest winds and heaviest rains of the storm even though the center of the eye is "practically calm" (Emanuel, 2005: 12). The eye itself is on average 20 miles wide and is surrounded for hundreds of miles on either side by spiral bands of thick cumulonimbus clouds producing heavy rains and winds (Tammemagi, 2009).

Before the advent of modern tracking technology, locals and meteorologists alike were only able to determine the approach of a storm by making basic observations about wind and wave direction. Huge waves produced in the eye of the hurricane can travel a thousand miles ahead of the storm, slowing regular wave speed down to 3-5 per minute compared to the usual 12-15. If the direction from which the waves hit the beach does not change it means that that storm is headed directly for that stretch of coastline. Barometers, which have been used to measure air pressure since the seventeenth century, also anticipate a storm well before its arrival, with the needle beginning to rise and fall erratically until a hurricane is about 500 miles from the coast, at which time the needle usually steadies and pressure begins falling rapidly. Around this time, the outer bands of the storm arrive as wispy white cirrus clouds. At this point,

the position and course of the storm eye can be determined based on the direction of the wind, although its strength and orientation are subject to change suddenly under unpredictable environmental conditions. These observations, combined with reports from ships and other locations in the Caribbean, enabled meteorologists to establish the general location of a hurricane, and after a report was issued to the media, locals would begin the process of tracking the storm with the assistance of charts recording historical storm tracks as well as blank maps overlaid with grids depicting latitude and longitude lines. Ernest Hemingway's account of the Labor Day Hurricane of 1935 gives a sense of the degree to which locals were involved in the process of tracking and anticipation. He writes:

This is the way a storm comes. On Saturday evening at Key West, having finished working, you go out to the porch to have a drink and read the evening paper. The first thing you see in the paper is a storm warning. You know that work is off until it is past and you are angry and upset because you were going well... The location of the tropical disturbance is given as east of Long Island in the Bahamas and the direction it is traveling is approximately toward Key West. You get out the September storm chart which gives the tracks and dates of forty storms of hurricane intensity during that month since 1900. And by taking the rate of movement of the storm as given in the Weather Bureau Advisory you calculate that it cannot reach us before Monday noon at the earliest (Hemingway, 1935).

Even today, many Floridians avidly involve themselves in storm tracking as professional landfall predictions have been notoriously inaccurate through the years. Hurricane Andrew, for example, a devastating category 5 storm that caused \$26.5 billion worth of damage in the Miami area in 1992, was expected to hit the Keys but veered northward instead. Likewise, Hurricane Katrina in 2005 was predicted to make landfall in the upper Keys, but missed them entirely, passing over mainland Florida and then gaining strength as it travelled across the Gulf of Mexico and made landfall on the coast of Louisiana.

The vast size of a hurricane allows considerable scope for atmospheric variables to alter the path and strength of the storm. In addition to unexpected wind sheers and temperature changes, conditions that may affect hurricanes in the Atlantic

basin include the temperature of the Gulf stream during any particular year; a mobile, rotating high pressure zone called the Bermuda high that can push hurricanes eastward into the Atlantic; El Niño, the oscillating climate pattern that occurs sporadically and seems to suppress Atlantic Hurricane activity for reasons that are not entirely clear (Emanuel, 2005: 256); the Loop Current, a mobile area of warm, deep water in the Gulf of Mexico that can intensify storms; as well as the presence of other weather systems that can either strengthen or block hurricanes. Despite these chaotic variables, the National Hurricane Center has described a 50% improvement in hurricane tracking in the last 15 years, although little improvement has been made in determining the strength of the storms (O'Hara, 2012). Despite the advent of reconnaissance aircraft and radar in the 1940s, forecasting relied on recognizing existing patterns of hurricane formation and landfall until the late 1950s when numerical models were created. This forecasting progressed somewhat with computer models in the 1960s but remained highly inaccurate until these mathematical models were greatly improved in the 1990s (Emanuel 2005). The inaccuracy of early models is captured in a Miami Herald article from 1969 in which the writer, while acknowledging that "hurricane-watching is still one of the most inexact sciences around" describes an array of radar devices and aircraft that are expected to deliver "the best detection, tracking and forecasting in history" (Pothier, 1969: 2A). Yet this cutting-edge system failed to accurately predict the landfall of horrifically destructive Hurricane Camille in Mississippi just two months later.

Today, meteorologists use 'ensemble forecasting' to predict a storm's track by numerically modeling a number of possible futures based on slightly different conditions. Since 2003, the National Hurricane Center has been presenting these predictions in a 'cone of uncertainty', a visualization of possible futures within a 5-day period. The size of the cone has narrowed in recent years as tracking has become more

accurate. During one visit to the National Weather Service headquarters in Key West, I was able to observe how these futures are arrayed on a tour of the instrumentation roof from which meteorological balloons are launched twice a day. Also on the roof a number of sizeable antennae, part of a network of weather sensors known as an Automated Surface Observing System (ASOS), automatically collect atmospheric measurements at various temporal increments from hundreds of surface stations. Measurements are also gathered through reconnaissance aircraft that take off at regular intervals from nearby Key West airport, as well as through various private weather networks belonging to universities, the Florida State Departments of Forestry and Transportation, and groups of amateur forecasters. The greatest innovations in forecasting, I was told, have come through this relatively recent communication effort that began in the late 1990s at an unprecedented meeting on data sharing between universities, government bodies, the National Hurricane Center and the US military. Measurements made by each of these entities attune to the physical atmosphere, contributing to an ensemble of folds in space through which the hurricane is sensed, materialized and tracked.

These efforts to quantify hurricanes based on their movement through striated space are paralleled by equally complicated efforts to measure the forces they unleash. Cyclones are created through a disequilibrium between the ocean and atmosphere through which heat is absorbed from the ocean through evaporation and sucked up through the hurricane's eyewall to be expelled into the upper atmosphere. This thermodynamic process was described by 19<sup>th</sup> century French engineer Sadi Carnot and calculated based on an unachievable potential intensity which Stengers has described as "the most astonishing thought object ever devised" (2010: 140). Carnot's calculations predict the maximum wind speed achievable by hurricanes, yet the storm is never able to reach this peak because it is slowed by land masses, colder water or

unfavorable atmospheric conditions. Thermodynamics thus attempts “to *make measurable* a phenomenon that does not itself determine its own measurement” (Stengers, 2010: 148, original emphasis). This effort to describe the material energy of a hurricane has been roughly translated for public understanding through the Saffir-Simpson scale, used since 1971, which considers the central pressure of each storm and organizes them based on the strength of sustained winds, distributing hurricanes into five categories of wind speed. This scale, however, does not accurately communicate the damage a storm may cause, as even a weak category 1 hurricane can cause a devastating storm surge under the right conditions. New efforts to quantify the force of hurricanes include the Hurricane Severity Index, which was developed following the 2005 hurricane season and considers the size of a storm in addition to the strength of its winds.

Yet any representative model is fraught with error, as quantifying all relevant parts of the remote atmosphere and ocean at once is a virtual impossibility. ‘Hurricane hunter’ aircraft, both manned and remotely operated, are sent into the eye of the storm loaded with sophisticated instrumentation that sends readings back to the National Hurricane Center, yet these aircraft fly at 10,000 feet and there is no way to get accurate surface readings over the ocean or measure localized wind shears. Quantification has improved slightly in recent years, with satellites now being used to track clouds and other atmospheric features to determine the strength of a hurricane. The success of this method was especially evident during Hurricane Sandy, which was the first storm to be tracked by the Suomi spacecraft, launched in 2011 specifically to understand meteorological events (Amos, 2012). Hurricane Sandy, in fact, proved to be a landmark event in that the “astonishingly accurate weather forecasting models” (Peacock Productions, 2012) used by the Met Office in the UK were able to accurately predict the storm’s landfall over a week in advance, giving residents and authorities

enough time to prepare for the catastrophe. Yet data from hurricane hunters and satellites only provide a “good starting point”, according to Key West Meteorologist Matt Strahan (Iannotta, 2005), as the official strength of a hurricane is only pieced together after the storm has passed. In 2005, the strength of Hurricane Wilma was determined in the months following the storm by compiling wind measurements from various instruments throughout the Keys, a process called forensic meteorology (Iannotta, 2005)<sup>22</sup>. Strength is also difficult to determine because water temperature and other complicated atmospheric conditions can also cause a hurricane to intensify or ‘rejuvenate’, quickly creating a faster moving vortex with a more distinct eye. This poorly understood process occurred in a number of very intense hurricanes, including the Labor Day Hurricane of 1935 and the 1900 Galveston Hurricane that killed 8,000-12,000 people in coastal Texas.

Hurricane destruction comes from two sources: the wind which, in extreme cases, can reach speeds of up to 200mph, and storm surges which can flood coastal areas causing mass flooding. Storm surges are likewise complicated and difficult to predict, and are caused by a combination of factors including the size and intensity of the storm itself and the physical geography of the area of impact. The low pressure in eye of the storm pulls water upward, with the most intense hurricanes lifting the sea surface about three feet (Emanuel, 2005: 147). The surface is lifted even more when currents created by strong winds encounter shallow water near coastlines and the rise and fall of predictable tides can contribute up to eight feet to surges in certain areas (Carson, 1955: 30). The shape of the coastline can amplify the surge, especially in restricted areas like bays and inlets. This was the case during Hurricane Sandy when the corner created by the intersection of the New Jersey coastline and Long Island

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<sup>22</sup> Woodward et al (2015) discuss this issue of modeling in greater detail in their exploration of a collaborative visualization of Hurricane Katrina, calling attention to “the active role of the technical object in its own production”(2015: 503).

contributed to the 13-foot storm surge in Manhattan, yet this surge was hugely underestimated even though the landfall prediction was accurate.

Despite concerted efforts at quantification, hurricanes remain a phenomenon of smooth space and ultimately defy any striation we attempt to attribute to the atmosphere. As Deleuze and Guattari explain, this is “the difference between a *smooth* (vectorial, projective, or topological) space and a *striated* (metric) space: in the first case ‘space is occupied without being counted,’ and in the second case ‘space is counted in order to be occupied’” (1987: 361-362, original emphasis). As ‘cones of uncertainty’, idealized Carnot engines or Saffir-Simpson categories, hurricanes are tracked through quantified and striated space. Yet these measurements are unable to accurately convey either the force or the trajectory of a hurricane in the sense that “its abstractions are merely analytical constructions, conveniently isolated from the flux of totality” and any attempted measurement “reduces reality to the terms of its own analytical abstractions” (Demeritt, 2001: 314). While these measurements remain practical tools for communicating the changeable and dangerous nature of hurricanes to the public, they fail to convey the infinite folding of a hurricane’s spatial effects as it moves through the meteorological atmosphere. Eventually, a hurricane can begin to weaken and die out for a number of reasons. It can travel over cold water causing it to lose energy and slow its rotation. The vortex can be cut by a strong wind shear or a strong temperature contrast in the atmosphere, causing it to slow and falter. Landfall also causes hurricanes to slow significantly because they can no longer absorb heat from the water to power their rotation. After reaching land, the storm undergoes ‘extratropical transition’, combining with other systems into a wider storm with a weaker core, no longer drawing its energy from the latent heat of condensation but from differences in atmospheric densities. The hurricane’s energy dissipates back into

the turbulent atmosphere, unfolding indefinitely as other winds, other clouds and other precipitation long after our attention has turned elsewhere.

### **Through the upper floor**

“Now the storm goes away again in a series  
of small, badly lit battle-scenes,  
each in “Another part of the field.””

-From ‘Little Exercise’ by Elizabeth Bishop) (1989)

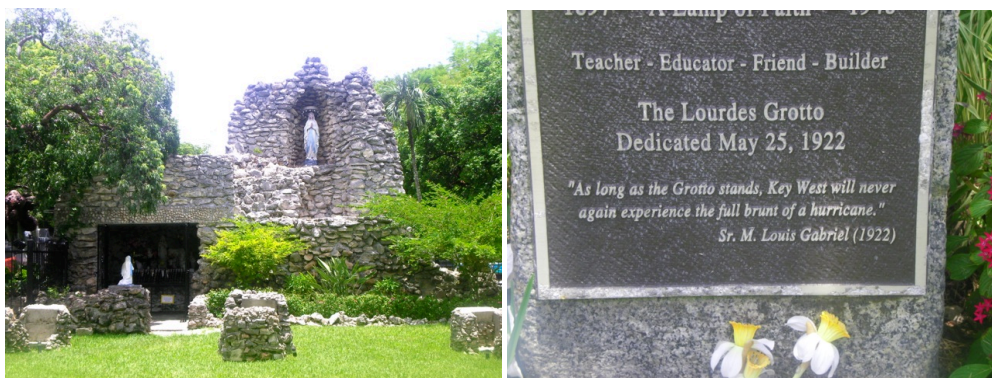
Hurricanes begin in a nebulous region of sensation and anticipation as much as they begin as hot desert winds rolling off the coast of Africa; they end as people’s possessions, washed out of ruined homes, stuck in trees along the rivers for months, as much as they end as scattered cloud cover over the Midwestern U.S. A storm tracked through Deleuze’s lower floor follows the hurricane’s movements through the physical atmosphere: its location based on abstract coordinates; the force of its passage; the impact of its winds and waters; the properties of the air itself. Through the upper floor, on the other hand, the tracker follows a path of qualities rather than quantities. Progress is felt rather than charted, following a trail of affective attunements that begins even before meteorologists start tracking a storm as it is forming far out over the Atlantic.

Andy Devanas worked as a meteorologist for Florida Emergency Management before moving to the Keys to track hurricanes for the National Weather Service in the most vulnerable county in the US. His whole career has involved anticipating and dealing with disasters and he feels distinctly drawn to this type of work acknowledging that there’s “something sick and sadistic about it”. He feels the stress of “knowing what hurricanes can do” starting to get to him as he nears retirement, yet he knows that he will feel a significant loss when he’s no longer working at the frontlines of unpredictability. Andy, through his years of hurricane experience, identified three general phases of a disaster: first the anxiety that comes with the anticipation of the event (“not being impacted by an event but the *thought* of being impacted”); second

the time during which the destruction is actually happening, when we are thinking clearly and we “function best in middle of the event”; and third the “crash” which he describes as a physical and mental letdown after the disaster during which we must absorb the full scope of the destruction. The second phase, a process that could be described as the actual ‘weathering’ of the storm, is, in many ways, entirely action-oriented and cannot be accurately conveyed after the fact, a point that I address in Chapter Seven. Andy’s third phase is the affective equivalent of the drawn-out process of a storm becoming extratropical and eventually dying out over land, during which those affected must actually deal with the various outcomes of the catastrophe. Anticipation, encounter, coping: these stages provide rough latitudinal lines of subjectivity, a tentative grid across which a storm can be affectively tracked.

Here, I am concerned with Andy’s first phase of the disaster, during which hurricane season generates a palpable field of anticipation in the Keys in that past storms are already subjectively mapped into residents and landscape alike. Central to this anticipation is a well-used hurricane grotto at the Saint Mary Star of the Sea church that was built in 1922, following a hurricane that devastated Key West in 1919. A local nun had a vision in which the Virgin Mary told her to build a replica of the grotto at Lourdes, France, to protect the island from ever being directly hit by a hurricane again. So far it has been effective: although storms such as Wilma, Donna and the 1935 hurricane have devastated the Keys, a hurricane’s eye has not passed over Key West since 1919. Spaces such as this grotto, however, are not simply available in the event of an emergency but are very much part of the present affective ambiance through which “preparedness involves becoming immanent to life” (Anderson, 2010a: 791). The anticipation of a hurricane, or in this case countless years of hurricanes, has an embodied component for locals in the sense that “What affects us—the sentience of a situation—is also a dwelling, a worlding born from an atmospheric attunement”

(Stewart, 2011: 449). This attunement to the power of a hurricane was virtually non-existent in Vermont prior to Hurricane Irene in 2011, yet a year later when Hurricane Sandy was being tracked up the coast along a similar path in October 2012 Vermonters were in a state of high anxiety. When Sandy arrived, Irene was still an embodied reality for those who experienced it first hand; it was still a visible and felt presence in condemned homes, bridges under construction and newly-cut riverbanks. However, many New Yorkers, having sustained little damage beyond a temporary power outage during Hurricane Irene, remained home during Sandy despite mandatory evacuation orders. The ambient effect of hurricanes is much stronger in somewhere like New Orleans or the Florida Keys than it is in New York, in that “Threat has an impending reality in the present. This actual reality is affective” (Massumi, 2010: 54). As storm tracker Scott McPartland explained, Hurricane Sandy was not fully anticipated and “there was complacency because we didn’t have anything we could pull from and say ‘you remember how bad it got last time?’ There was no last time” (Peacock Productions, 2012). The threat of hurricanes is affectively continuous, extending beyond the storm as an ambient materialism that lingers in previously affected areas.



**Figures 23 and 24.** “It is very hard to find a spot to put a candle in the Grotto; it is an amazing sight” Rev. Father Francisco Hernandez prior to Hurricane Wilma in 2005 (Bolen and Rork 2005) [photos: author]

In the Florida Keys, so frequently visited by hurricanes, these catastrophes have become the material of the place itself. Hurricanes are a regular threat throughout the summer and fall and are events that people in the Florida Keys live *with* and not in spite of. The “flashlight drill” is second nature to Floridians and stories of loss, survival

and lawlessness are traded endlessly among locals. Keys residents were described to me as “bootstrappy” by the editor of a local newspaper because they are accustomed to pulling their lives back together after a storm ravages the area. The newspapers welcome the hurricane season every year with articles speculating on whether or not the Keys will get another “big one”, always referencing the unbelievably powerful Labor Day Hurricane of 1935 that killed around 500 people. However, with a remarkable 70% of Keys residents originally from elsewhere, and with an equally remarkable 50% of the population turning over every 5 years, a majority has not yet experienced a catastrophic hurricane. Many of the people I met in the Keys in 2011 had lived elsewhere in 2005 during Hurricane Wilma. Hurricanes therefore generate an environmental knowledge as much as they generate an embodied knowledge. Threat is a quality that “suffuses the atmosphere. Threat is ultimately *ambient*” (Massumi, 2010: 61), and so this ‘hurricane bravado’ is itself largely ambient. Hurricane futures are “constantly embodied, experienced, told, narrated, imagined, performed, wished, planned, (day)dreamed, symbolized and sensed” (Anderson, 2010a: 783). This sensibility, particular to this place, provides the felt atmosphere through which hurricanes can be affectively tracked in the Keys and through which the future is anticipated. If “Sensation is the mode in which potential is present in the perceiving body” (Massumi, 2002: 75), then each storm, as it works its way across the Atlantic or through the Caribbean, moving closer to the Keys is an embodied practice, requiring an attunement not only to the air and the ocean, but also to the sentiments of friends, neighbors and public figures. Every meteorologist and emergency manager I spoke with complained that in terms of hurricane preparation and evacuation, people don’t respond to stated threat but to perceived threat because they need to confirm their tracking information among several sources before choosing to prepare and/or evacuate (Baker, 1991: 1995). Annalise Mannix, Key West’s Emergency Manager during

Hurricane Wilma, was exasperated that no matter what type of public service announcements they city put on the local radio or in the newspapers warning people to stock up on supplies, fortify their houses or evacuate, no one seemed to listen. As Hurricane Wilma approached the Keys, despite a county-issued storm surge warning, excitement over the city's highly anticipated yearly 'Fantasy Fest' bacchanalia, played a major role in the decision to evacuate, with a remarkably low compliance rate of only 7-15%.

In this atmosphere of constant anticipation, locals used many unusual methods to predict the arrival of hurricanes prior to the advent of modern forecasting techniques, including floating tobacco ash in water, assessing fruit tree production or flower size, and observing the number of ants present in a particular year (Heller 1969). Even as recently as 2005, amidst a record-breaking hurricane season, the local newspaper published a feature story discussing how Key West's sizeable wild chicken population can anticipate the arrival of a storm through their hollow bones which are more sensitive to atmospheric pressure (Henson, 2005). Many of the preparedness measures I encountered in the Keys were likewise quirky and demonstrate "different styles of disclosing and relating to 'the future' in relation to 'the present'" (Anderson, 2010a: 782). During the first half of the 20th century, when hurricane tracking was less accurate and evacuation even more tedious, people would tag their own toes, I was told, so their bodies could be identified if they were killed during the storm. Some would keep lengths of rope on hand to tie all of the children together or tie themselves to trees to prevent being blown away if their shelter was destroyed. One person told me that when she bought her house in the middle Keys in the 1980s, there was a drainage hole in the floor and hooks in the ceiling that were part of a complicated pulley system the previous owner had devised to hoist the furniture off the floor to avoid damage during a storm surge. Ironically, the people who purchased this home turned it into a

multi-million dollar mansion, without drainage holes, that was completely destroyed in hurricane Wilma and subsequently rebuilt. These days, locals make sure they have a few thousand dollars in cash on hand before a storm; this ‘hurricane fund’ is used to cover expenses while infrastructure is down. One man proudly showed me his boat dock, which he built in removable modules that can be easily stored during a hurricane, as docks are often the first thing washed away. He told me it is the only one like it in the Keys. A family I met lived in a dome-shaped home, which was built on stilts to aerodynamically resist hurricane winds and to avoid storm surge damage. They are continually surprised that there are only a handful of houses like theirs in the Keys, even though this style of home is popular in coastal Texas, which is also subject to frequent hurricanes. One woman I interviewed has a very modest house in Key West that had to be rebuilt after Wilma; she went as far as to purchase a house in central Florida, which cost “virtually nothing” after the housing crisis, just in case her home is destroyed again. Even the National Weather Service offices in Key West had to incorporate creative preparedness measures into their new headquarters. When the building was being constructed from a standard government architectural plan they had to request a special storage room that they actually use as a secret bunkroom so meteorologists can sleep in shifts during hurricanes when they are not able to return to their homes because the one road through the Keys is often impassable. There were 15 people sleeping in there during hurricane Wilma.



**Figure 25.** (left) Hurricane shutters on a house in Marathon, FL [photo: author]; **Figure 26.** (right) Dome house [photo: Bonnie Sanderson]

Locals were suffering from 'hurricane fatigue' in 2005 because Wilma, which arrived on October 24th, at the very end of the hurricane season, was the fifth storm of the year that affected the Keys. By this time, residents were tired of evacuating and exhausted from dealing with the anxiety of wondering if the next storm would be the "big one". The Florida Keys need a full 36 hours to safely evacuate all 73,000 residents and storms can change speed and direction considerably during that time, making evacuation unnecessary after orders have been given and generating much political controversy. Each previous storm caused at least some flooding or wind damage and before Wilma even arrived, official evacuations had become so frequent that people stopped unboarding their windows, living in darkness and in a constant state of anxiety. One enterprising local sold bumper stickers that read "Another weekend, another hurricane". These first four storms did not cause significant damage to physical structures, but already that year local subjectivity was altered by their unpredictable nature. Andy Devanas told me that he was so exhausted from the constant preparedness that he felt like he could "stand on the sea wall yelling, 'Come get me! I don't care!'" A photo in the local newspaper published on October 22<sup>nd</sup>, 2005, two days before Hurricane Wilma's storm surge inundated the Keys, captured this sense of hurricane fatigue. The article, entitled "Keys residents tired of waiting for the arrival of Hurricane Wilma" featured a photo of an indignant-looking man sitting at a bar in Key West, with the caption "Scott Newton reacts to yet another weather update Friday morning at the Schooner Wharf Bar". This picture illustrates the viscosity of anticipation so that it could be considered a picture of Hurricane Wilma tracked and anticipated through the affective atmosphere:



**Figure 27.** “I’m over it, way over it,” said Scott Newton... ‘Is it November yet?’” (Keys Residents Tired of Waiting for Arrival of Hurricane Wilma, 2005) [photo: Rob O’Neal]

It is a photo representing a hurricane track inscribed into a human body. Scott Newton, in this image, shows us a ‘cone of uncertainty’ tracked through the affective atmosphere in that “Its vectors are perspectives of the flesh” (Massumi, 2002: 59). In the same way, the following image represents Hurricane Wilma tracked and anticipated through the meteorological atmosphere, also on October 22<sup>nd</sup>, 2005:



**Figure 28.** Hurricane Wilma ‘cone of uncertainty’ [image: noaa.gov]

Both images necessarily fail to capture the storm in its entirety, yet as representations they render the hurricane speculatively present and suggest the imprint hurricanes have on both human subjects and material space. In their depiction of uncertainty, they also

emphasize the idea that folding can continue through both atmospheres as anticipation remains open to further and infinite folding.

### **'Little vortices in a maelstrom'**

Andy had a lot to say about the third phase of the hurricane event, which lasts the longest. Even with all his experience, he was “in a daze” after Wilma and explained that most people who experience a disaster “get into a strange space” afterwards. He told me a story about the days following the storm when his neighbors who had an emergency generator invited him over for a hot meal, which was very appealing since the power was out, but he declined the invitation because he could feel himself starting to lose consciousness as he was talking to them. Then he went home and sat by himself in the dark and couldn't figure out why he had said no to a hot meal. People were exhausted after the trauma of Hurricane Wilma. One described the shock of watching his house fill with 3 feet of septic water and told me, “I look back on that and I get tired. I could take a 2 hour nap right now just talking about it”. For years people were constantly worrying about when another storm surge would come and many described having difficulty acquiring new possessions because they were afraid to lose everything again. “You don't believe you can ever go back to living the same way,” I was told. A hurricane is “more than just the damage assessment when you get through it”; its effects are insidious and ongoing, causing drastic changes in the affective atmosphere through what Stewart calls “the proliferation of little worlds” (2011: 446). Hurricanes continue unfolding long after landfall in other ways as well. Hurricane Georges in 1998 caused flu to spread through the Keys from overflowing sewers described to me as the “worst outbreak of anything I've seen”. Likewise, following Wilma, MRSA outbreaks from exposure to raw sewage plagued locals for the next year or more, killing at least one person and forcing another to spend months in a hyperbaric chamber having his immune system rebuilt. In Key West, many people were still amazed at how fertile the

island was after the hurricane from all the sewage that had been churned up. There were wild tomatoes growing everywhere that no one was willing to eat. As Deleuze explains, “Dividing endlessly, the parts of matter form little vortices in a maelstrom, and in these are found even more vortices, even smaller, and even more are spinning in the concave intervals of the whirls that touch one another” (1993: 5). A hurricane doesn’t begin or end with the storm’s passage, but continues through the tinier and more tangential details of the storm’s subjective and physical existence, fold after fold after fold, in that “There is no movement that is not nested within another movement with which it is in continuity” (Manning, 2009: 39). The storm originates in and continues through the miniscule foldings where a tracker can’t, or perhaps doesn’t know to, go.

The effects and affects of hurricanes proliferate indefinitely, yet the work of a tracker along this trajectory is necessarily limited. A track, whether following an animal or a hurricane, is a finite section of this continuity, a series of atmospheric attunements, registering both meteorologically and affectively through a process in which “things matter not because of how they are represented but because they have qualities, rhythms, forces, relations, and movements” (Stewart, 2011: 445). This chapter has been an attempt to conceptualize the atmosphere as a single field of turbulent change in which materials exist in and through this torsion between attunements as folds in space and folds in subject. Materiality is achieved not just through the existence of physical things, but because of the forces and energies that form, move and resonate with those things, so that “the experience of the future relates to the materiality of the medium through which it is made present, whether that be a graph or an affective atmosphere” (Anderson, 2010a: 793). A hurricane materializes along the inflected line between form and perception, our senses apprehending the storm until a lapse in our attention brings the event to a close. “Events are only events because they perish” (Manning, 2009: 39), yet “It is their perishing that culminates their potential. The perishing is not the end: it

propels the preacceleration of a new occasion of experience” (2009: 39). Hurricane potential continues through the ambient materialism of the threat and anticipation of the next hurricane.

As storm trackers, we seek not to hunt and capture the event, but rather to achieve a temporary and tentative immanence with the maelstrom, to involve ourselves “In a tumultuous privacy of storm”, to borrow a poetic line from Ralph Waldo Emerson (2009). Tracking is not just an act of following, but an act of apprehension and anticipation that follows the line of inflection through the proliferation of events unfolding. Again, a parallel can be drawn between tracking a hurricane and tracking an animal:

The more intimate we become with other lives, the more aware we are of how those lives connect with and affect our own... as we track the animal farther, we find that its trail is our own trail. As it moves, it affects its surroundings. What changes the animal changes its environment, and thus changes us. There is no separation; its fate is our fate. We are tracking ourselves in a sense (Rezendes, 1999: 15).

The atmosphere through which the hurricane is being tracked is twofold so that the physical reality of a hurricane and the subjective reality of a hurricane are inseparable and the atmosphere itself is “a space that is simultaneously processual, distributed and sensed” (McCormack, 2008: 413). Affect and air both possess an “immanence to things” (Stewart, 2007: 3), making storm tracking at once an abstract and an embodied experience. A turbulence in the material atmosphere creates an equivalent turbulence in the subjective atmosphere. Through this resonance, the atmosphere emerges as one and the same generative environment in extension in two directions, a dual proliferation of folds through a dynamic and extensive atmosphere, occupying space without being counted.



**Figure 29.** The streets of Long Beach, NY following Hurricane Sandy [photo: Chris Cassidy]

**Monday, October 29, 2012**

My 88-year-old grandmother is being forced to evacuate her home on Long Island. The town I grew up in has been vacated as well. I spoke to my parents in Vermont last night and even so far inland they are expecting the power to be out for a week or more.

**Tuesday, October 30, 2012**

The New York Times is reporting general destruction but few specifics. A second storm surge hits the New York area. The media is starting to call Sandy a 'Superstorm'. No word from friends and family.

**Wednesday, October 31, 2012**

The New York City subway is completely flooded, as are the five tunnels connecting Manhattan to the mainland. Breezy Point, a seaside community just West of Long Beach, has burned to the ground. My grandmother is fine but she has been unable to check on her house.

**Thursday, November 1, 2012**

I talk to a childhood friend who grew up on the same block as her husband. Both of their family homes were destroyed and she is moving all four of her kids into one bedroom to accommodate the influx of family. Long Beach was completely overwhelmed by the ocean; very few houses were spared.

**Friday, November 2, 2012**

I am told that people are still wandering around Long Beach in disbelief, hugging and crying. The smell of mold and sewage is making it very difficult to empty ruined houses. Cell phone towers are down so no one can make any calls. The Red Cross has arrived to hand out food and water. A 7pm curfew is being enforced by the National Guard.

**Saturday, November 3, 2012**

A friend describes digging her wedding dress out of the soggy,

sewage-covered remains of her house and throwing it on the garbage heap on the sidewalk. People are waiting on hour-long lines to show identification just in order to be let in to Long Beach.

**Sunday, November 4, 2012**

Gas lines in Brooklyn are 30 blocks long. My cousin witnesses a 50-person brawl at a gas station. There are reports of people pulling guns on each other.

**Monday, November 5, 2012**

No one has any power, heat or water still and there is no indication of when it will return. The streets of Long Beach are piled high on both sides with mountains of trash.

**Tuesday, November 6, 2012**

A friend gets into a bad car accident in Long Beach because the traffic lights are still not operating.

**Wednesday, November 7, 2012**

Power has been restored to a few small areas, but there is still no drinking water. A friend observes that it is possible to get more accomplished on the phone with FEMA when you are willing to cry uncontrollably.

**Thursday, November 8, 2012**

An 'odd-even' system is introduced for purchasing gasoline in New York and lines seem to be improving. A friend's mother, whose house was destroyed, keeps accidentally calling the storm 'Katrina'.

**Friday, November 9, 2012**

Those involved in the clean up are developing what is being called the 'Rockaway cough' from a suspected combination of pollutants and dust. Authorities are recommending the use of respirators.

Has it ever struck you, Connie, that life is all memory except for the one present moment that goes by so quick you can hardly catch it going? It's really all memory, Connie, except for each passing moment. What I just now said to you is a memory now—recollection.

-Tennessee Williams, *The Milk Train Doesn't Stop Here Anymore* (1969)

## Chapter Five: Signifying the present

**preface, v.:** To introduce, herald (an event, etc.).

**Etymology:** Latin < *prae-* PRE- + *fārī* TO SPEAK.<sup>23</sup>

At the Comprehensive Plan Evaluation and Appraisal Report (EAR) Meeting on November 2<sup>nd</sup>, 2011, the Board of County Commissioners, sitting at a long table at the front of the room, was reviewing the “Climate Change/Hazard Mitigation” section of the document in front of an audience of local activists, military personnel, and a number of hired consultants. The conversation dragged on as the Commissioners seemed to sidestep the problem of sea level rise itself, an issue they had avoided taking a position on prior to the drafting of this new Comp Plan, largely out of fear that an official pronouncement on climate change could cause property values to plummet throughout the Keys. Instead, they were focusing on the minutiae of recycling programs, native plant codes, green infrastructure and storm water outflow. Chris Bergh had been sitting quietly in the audience for a number of hours as the meeting dragged on, but at this point he made it known that he would like to speak and was acknowledged by the moderator. He walked to the front of the room to stand at a podium next to the panel of Commissioners. “Climate change”, he began, “is a current and not a pending threat.” He explained that sea level is expected to rise 3-7 inches by 2030, a timeframe that coincides with the 20-year planning horizon of the new Comp Plan. When there has been a rise of 3 inches, he predicts, residents will be concerned on a widespread level. With a 7-inch rise, he continued, “informed people are going to be making exit strategy plans”. Rather than tiptoeing around the issue, the Comp Plan needs to clearly outline strategies for dealing with sea level rise, echoing the effective mitigation and response plans already in place for hurricanes. Residents feel secure in the Keys despite the regular threat of hurricanes and the county needs to think about

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<sup>23</sup> All definitions in the section headings of this chapter are from OED (2015).

sea level rise in the same way; they “would do themselves a great service by planning now”. This new Comp Plan, he explained, is the government’s opportunity to show future property owners that “living in the Keys is a reasonable risk to take”. With the topic finally introduced, Chris returned to his seat as the discussion shifted to “accommodation and retreat strategies”.

At the time of writing, the Monroe County government is in the final stages of the four-year process of redrafting the county’s Comprehensive Plan, an endeavor that is undertaken every 20 years, the previous version of the Plan having been adopted in 1995. The Comp Plan serves as a strategic document for all development, capital improvements and social services undertaken and delivered by the county and, for the first time ever, the Plan will include a section on climate change mitigation, with Chris’s extensive efforts playing a major role in this development. The text to be incorporated into the Comp Plan not only legitimizes sea level rise as a local issue, but also attempts to stabilize the still very inconstant and uncertain “hyperobject” (Morton, 2013) of climate change in order for action to be taken to mitigate its effects on the imperiled Florida Keys. This policy document, along with other signs of escalating inundation, including elevated sewer pumps, increased insurance rates and salt water puddles, serves as an “anticipatory object” (Leyshon and Geoghegan, 2012) through which the government seeks to “manage the future and adapt to climate change” (2012, 240) but also through which climate change becomes a definite and tangible occurrence so that the document “materialises an abstraction” (2012, 240). This is an effort that is *comprehensive* not only in the sense that it contributes to a broad plan for county-wide progress and management but because this particular section of that plan is forcing a wider *comprehension* of the issue of sea level rise and its affects on the Keys. The document conveys a certain immediacy that may compel residents to more fully grasp the idea that an alarming future is quickly narrowing in on the present.



**Figure 30.** High tide, Big Pine Key 2009 [photo: Alison Higgins]

However, this is not a simple process undertaken by a Board of County Commissioners in agreement with each other and with the Climate Change Advisory Committee (CCAC) who they appointed to prepare the guidance document that provides the text of this section of the Comp Plan. Each participant at each stage of the Plan's composition knows and understands climate change to be a different experience based on their own affective and material encounters with weather, environment and information in the Keys and beyond. Those tasked with composing and evaluating this document, a group made up of individuals ranging in motivation from committed conservationists to wealthy real estate developers and politicians, are attempting to fix the issue of sea level rise in the present in order for it to be acted upon for the sake of an unknown future. In other words, "presencing does not guarantee agreement, consensus and acquiescence – far from it. When climate change is presenced it becomes a bone of contention – it does not in and of itself provide an incontrovertible justification for action in the landscape" (Leyshon and Geoghegan, 2012: 243). Hence, the County Commissioners' reluctance to publicize any fixed acknowledgment of climate change as an objective truth, which can be read as "a symptom of how people are still not ready to go through an affective experience that would existentially and politically bind them to hyperobjects, to care for them" (Morton, 2013: 184). While few

seem to be debating the fact that sea level is rising and that it will have a detrimental effect on the Keys, the degree to which it is rising, the cause of that rise and the extent to which locals should be concerned are all realities under negotiation throughout the process of enacting legislation, a process in which “different participants in a community of promise ‘conspire’ or ‘collaborate’ in the authorship of a future” (Brown, 2005: 344). Contending with multiple perceptions of what the current and future effects of sea level rise may be, the Commissioners must work on behalf of the county to comprehend the radical urgency of the present as they reconcile their personal and collective interests with the Keys’ real but nebulous doom.

**prefix, *n.*:** An element placed at the beginning of a word to adjust or modify its meaning.

**Etymology:** Latin < *prae-* PRE- + *figere* FIX.

These ‘presencing’ efforts mark a period of ‘anticipatory action’ in the Keys, taking place “in the ‘interval’ between [the event’s] occurrence and its damaging ‘impacts’ and ‘effects’” (Adey and Anderson, 2011: 15). The creation of a successful guidance document is an anticipatory practice that must “do more than gather the knowledge necessary to know futures” in that it must also “enable the performative operation” (Anderson, 2010a: 783) required to stabilize the material and affective conditions of a changing present in order to adequately prepare for a future that remains questionable. This action on the part of the Monroe County government falls conceptually between the ‘precaution’ involved in dealing with an event that has already occurred and is carried out in the interest of “stopping or halting...something before it reaches a point of irreversibility” (Anderson, 2010a: 790), and the ‘preemption’ involved in actively realizing, “on the basis of indeterminate potentiality” (Massumi, 2007: unpaginated), what was previously only a potential threat. Also included are elements of ‘preparedness’, which is understood to encompass the actions

required to make provision for the aftermath of events (Anderson, 2010a). The climate change efforts emerging as part of the Comp Plan process are giving shape to a future that is still very nebulous but is also clearly inevitable. This is a situation in which there may be no possible actions on the part of the county that would prevent these very low-lying islands from becoming inundated, but, on the other hand, sea level rise is not yet a working reality for most Keys residents including a number of Commissioners and even CCAC members, and still needs to be *created* as a palpable and impending event that necessitates immediate action. What has resulted from these circumstances is a chapter of text in a county-wide planning document that preempts the issue of sea level rise by establishing its actuality while taking the precaution of calling for reduced emissions and establishing a number of preparedness measures including raised road beds and other infrastructural improvements. With regard to these ‘pre-’ concepts, Anderson notes, there is “a difference in how each intervenes in life” (2010a: 790), in that they describe how certain “Styles and practices enable open futures to be rendered actionable” (2010a: 787). The issue of sea level rise in the Keys, while adopting elements of precaution, preemption and preparedness, is functionally and affectively unique, engendering site-specific actions through which climate change is established as a governable concept in the present.



**Figure 31.** High tide, Cudjoe Key 2009 [photo: Alison Higgins]

The section headings of this chapter emphasize this 'pre' element in an effort to invoke the process of future-making at work in the Keys. Despite stylistic differences in the term applied, the future must always come from this 'pre' space situated 'before' the future actually occurs. 'Pre-' concepts don't simply frame and enable logics for dealing with the future but are ways to experience the future itself as an aspect of the present. Compellingly, the word 'present' also begins with this 'pre' prefix. The word is rooted in the Latin *prae* (before) and *esse* (to be) (OED, 2015), suggesting that the present also occurs somehow before itself. The present is radically inconceivable because once it has been identified through reflection it has already metamorphosed into a new present. To be present is thus not just 'to be' but 'to be before': it is the being that occurs before reflection gives form to this being. When Anderson describes a disaster as "incubating within the present" (2010a: 780), what he is describing is the process of 'presencing' by which a future disaster is generating more extensive material and affective signification surrounding its present state, "a host of interacting indexical signs" (Morton, 2013: 85) through which it can eventually be established as a widespread reality. Lefebvre identifies a rhythmic difference between that which is present and 'presence' itself: 'present' describes a thing that has a certain and instantaneous proximity to the perceiver, while presence occurs when a number of present things are rhythmically integrated "in a dramatic becoming, in an ensemble full of meaning" (Lefebvre, 2004: 23). Climate change in the Keys has an increasing presence that can be evoked through an ensemble of signs, even if it is not empirically and instantaneously present for a majority of residents. These signs, in the Keys', include the Key West tide gauge measuring an 8-inch rise in the past century, saltwater puddles emerging from sewer grates at high tides and will soon also include the new Comp Plan. As the present conception of sea level rise is increasingly surrounded by signs such as these and bolstered by flood models, increased media attention and vocal

activism, the reality of inundation will reach a threshold of acceptance through which sea level rise will become an actuality, rather than a potentiality, for Keys residents. The present can be understood to emanate outward into an expansive and ever-shifting atmosphere of signification that conveys at once the present's future and its past, which shift and change as the present itself continuously transforms. And in the Keys it is individual efforts and maneuverings of activists like Chris that are largely responsible for generating and distributing these signs of climate change to the point that the public begins to comprehend the threat and the government is compelled to take action. Therefore, in a continued attempt to conceptualize spacetime in relation to the changing climate, and following the idea that risks such as sea level rise have a particular "texture" (Jasanoff, 1999: 150) based on localized material and affective circumstances, I explore the atmospheric signification of the present in this chapter through a concern with the ethical encounters that constitute government processes.

**predict, v.:** To state or estimate, esp. on the basis of knowledge or reasoning, that (an action, event, etc.) will happen in the future.

**Etymology:** Latin < *prae-* PRE- + *dīcere* TO SAY.

Chris was initially apprehensive about the opposition he might encounter when he started publicizing the sea level rise data, but he was willing to risk his personal and professional relationships in order help the Keys adapt to and potentially mitigate the effects of climate change. He described this apprehension at the November 13<sup>th</sup>, 2011 CCAC meeting, in response to County Commissioner George Nugent's concern that when climate change information is made public through the new Comp Plan the commissioners are "going to get slammed from all directions" by developers, realtors, homeowners and business owners who are worried about their lives and investments. As Chris explained to the Committee, "the info does need to be out there and to be used, but it matters *how* it gets out there". He continued, "It shouldn't be presented as a

situation in which to panic and it needs to be made clear that this is not going to happen suddenly". He reiterated that this process is a balancing act and that "people want to be informed but not scared". It's important to know "when to follow and when to lead", and this tactic is the "key to graceful agenda-pushing; it's all about delivery." In 2009, he said, when he started his political work he was afraid to publicize the sea level rise predictions, but he was "objective" about it and listened to people's concerns, and, as a result, "nobody wrang my neck".

Most of the people I encountered during my fieldwork efforts seemed to know Chris well and it quickly became clear that he is held in high regard throughout the Keys. He is conveying a grim message to Keys residents but he's been successful largely because of the consistent and good-natured delivery of that message to a public with which he has already cultivated familiarity and trust. Newcomers to the islands, even those who have been residents for 20 years, have neither the credibility nor the localized knowledge to make such progress, while other environmental advocates I encountered were no less persistent, but overly aggressive in the delivery of their message. One such individual, when I asked why so many residents seem unconcerned about sea level rise, didn't hesitate in telling me, "It's because people are so fucking stupid." The public, of course, is much less receptive to this type of attitude. Chris, in contrast, is a relaxed and dependable advocate, a pleasant person who approaches fellow residents from a position that is congenial and supportive. He is legitimately interested in the issues and concerns of the people he meets and was, in fact, the only person I encountered in the Keys who even inquired about my research and to whom I bothered explaining anything beyond the fact that I was studying sea level rise and hurricanes. Chris's talent therefore lies not only in his ability to effectively convey critical scientific information but also in his regard for the needs and interests of others.

Sea level rise predictions may therefore be considerably less effective without a

well-situated individual to convey them to the appropriate audience. Chris's receptiveness to residents' concerns combined with his professional credibility enable him to traverse the government-public divide with relative ease. This is evident from an interview conducted with Brian Schmidt, whose great uncle, Philip Sadowski, was responsible for dredging and developing most of the city of Marathon in the 1950s. Uncle Phil's efforts established a very successful family business that is still thriving in its third generation with Brian overseeing one of the largest real estate businesses in the Keys. That success, however, could change in the near future if property values plummet as a result of a catastrophic storm or gradually encroaching water, and it was Chris who pointed this out to Brian, a long-time associate. "When Chris came to me with the flood models", Brian said, "I couldn't sleep for a while." He had been aware of sea level rise before Chris approached him but he did not think it was anything he would personally need to worry about because it's "too abstract right now". Sea level rise has not yet come up as an issue in any of his property sales, but he notes that real estate is already "a complicated process here", between flood and wind insurance, building codes, growth restrictions and endangered species habitats. Chris facilitated the realization that sea level rise is something Brian will have to take seriously within his lifetime, although Brian is still holding out some hope that it may be over-hyped. "My whole life surrounds real estate," he told me, "but now I have to start thinking about an exit strategy." He has begun operating his business under a timeframe of inhabitability and is altering his plans for the future despite his considerable social and financial investments in the Keys. He had encountered these predictions before but was not affected to the point of action: the flood maps needed Chris as a benevolent vehicle for the connection to be made. Chris was delivering what he described as 'objective' information to Brian, yet that information was only incorporated into Brian's long-term plans because it came from someone with a clear commitment to Keys and its

residents. Chris's expertise, from Brian's perspective, comes more from his affinity with the Keys than from his scientific credentials. While Brian is ultimately accepting of the fact that the Keys may become uninhabitable during his lifetime, he remains decidedly uncertain about the idea, emphasizing that he has lived in the Keys his entire life and has noticed no changes in the sea level. Still, he is willing to set aside any disbelief and commit to diversifying his real estate holdings because he has confidence in the knowledge Chris has developed through his years of localized experience as well as his inclination to act in the best interest of Keys residents. It is therefore the affective significance of Chris himself that not only makes the information he is conveying more locally palatable, but also serves as the medium of connection for these measurements and predictions. Representations, in other words, travel along affective pathways.

**represent, v.:** To symbolize, stand for, embody; to render perceptible; to bring clearly and distinctly before the mind or imagination.

**Etymology:** Latin < *re-* AGAIN + *prae-* PRE- + *esse* TO BE.

In the Keys, measurements, predictions and photos, along with less material abstractions such as ideas, conversations, and memories, function as signposts along a path connecting the relatively stable past of a tropical paradise to a future of almost certain inundation by the ocean. Climate change must be effectively prefigured, as discussed in Chapter Three, so that "Making the future present becomes a question of creating affectively imbued representations that move and mobilize" (Anderson, 2010a: 785). In the Keys, environmental advocates are distributing both scientific information and material evidence widely and energetically, mobilizing these signs in an attempt to empower others to make this connection for themselves. Through this work climate change representations and abstractions become a "movement residue" (Massumi, 2002: 7-8) through which sea level rise is articulated and through which it appears as a serialized phenomenon possessing a distinct temporality. However, the process of

connection is not mechanical or automatic, but rather *affective*. Representations need human and other expressive vehicles in order to sufficiently convey sea level rise as a real, felt potential in that “the future must be mediated through the evocation and performance of symbols and values as a means of connecting with emotions, desires, and longings” (Brown, 2005: 339). Despite the presence of what seem to be obvious impacts, sea level rise must still resonate in and through the sensibilities of individual residents to matter to the point that action is taken. Knowledge of climate change is therefore rooted in experience; it emerges through affective chains of signification linked through performances and encounters so that knowledge is as “a memorandum of conditions” (Dewey, 1958: 86) rather than a simple acquisition of information. Signs of sea level rise do not objectively exist but become actual as they confront and alter individual perceptions through continuous movement along affective pathways.



**Figure 32.** High tide, Big Pine Key [photo: Alison Higgins 2009]

The political work in which Chris engages positions him at once as the harbinger of a local doomsday scenario and as a trusted neighbor presenting “multiple instances of radical uncertainty, to the extent that notions of what constitutes an experiment, publics or politics, continually shifts” (Gabrys and Yusoff, 2012: 12). In his role, Chris must empathize with the majority of locals who are disinclined to accept the signs of catastrophic sea level rise yet also be able to exploit the trust he has garnered

throughout his lifetime in the Keys to effectively communicate predictions, flood models and other representations of the changing climate to a diverse public comprising a range of backgrounds, interests and opinions. This work must therefore be creative and spontaneous, following Connolly's micropolitics, in that it involves "a cultural collectivization and politicization of arts of the self," a practice that "applies tactics to multiple layers of intersubjective being" (2002: 107). Some of his endeavors in this regard are less effective, such as his efforts at a 'Liveable CommuniKeys' meeting he invited me to attend which aimed to incorporate the localized needs and interests of residents of the Lower Keys into the new Comp Plan. I arrived to find a room full of retired and reasonably well-off residents who barely paid attention when Chris stood up in front of the room to present his collection of figures and statistics and to remind everyone to consider the prospect of sea level rise for their communities. While his effort wasn't quite ignored, it did not generate the usual concerned response and as we were leaving he felt the need to apologize for inviting me to such a boring meeting. Despite this misstep, Chris is often able to relate back to his social environment in a way that effectively conveys the critical nature of sea level rise to any particular individual or group, as he attempts to alter local perceptions. His actions, echoing Spinoza, are taking on a different speed and direction than the majority of existing governmental and social activity in relation to climate change. He is attempting to resignify the Keys' present through the continuous movement, positioning and articulation of his own body and its expressions as "the *enactment* of ethical aspirations... requires bodily movements in space, mobilizations of heat and energy, a series of choreographed gestures, a distinctive assemblage of affective propulsions" (Bennett, 2001: 3). This type of ethical work is undertaken through a kinetic process of impact and influence produced through the temporally resonant efforts of politically motivated and interpersonally effective individuals.

Jasanoff (2003) cites a need for “technologies of humility” to facilitate effective communication between governments, as purveyors of science, and the often mistrustful and uncooperative public. Scientific knowledge, according to Wynne, is a “reality-based social and policy heuristic” (2010: 295), and, in dealing with the public, scientists and governments alike are guilty of trying to “instrumentalize a relationship which is supposed to be based on trust” (Wynne, 2006: 219-220). However, generating trust between ‘governments’ and ‘publics’ is not always so straightforward, particularly when different groups and multiple perspectives are involved. I was told by Billy Causey, head of NOAA’s National Marine Sanctuary, that during the inception of the Sanctuary in the 1990s, NOAA “bent over backwards” trying to get public input on issues including fishing regulations and recreational boating laws that they would be creating and enforcing with the establishment of the Sanctuary. “We wanted to let people know we were listening,” he said. However, it is “one thing to listen to people but another to assimilate their desires”. He described a scene in which Sanctuary officials were completely overwhelmed with local interests groups, including real estate agents and lobster fishermen, during the three days they had set aside for public hearings, rendering these attempts at trust-building completely ineffective. Billy said that in order to properly address public concerns NOAA would be required to undertake a “role of facilitation and adjudication which we are not equipped to do”, particularly with often patchy funding from state and federal governments. Governing bodies, in other words, struggle to find productive ways to affect and, in turn be affected by, the people they govern. Jasanoff describes her technologies of humility as “institutionalized habits of thought, that try to come to grips with the ragged fringes of human understanding – the unknown, the uncertain, the ambiguous, and the uncontrollable” (2003: 227). It is within this fringe of understanding that new realities form and take root, yet, as Billy explained, governments are often ill-equipped to deal

with this ambiguity. However, there is work already being done along this edge by environmental activists as the potential futures that develop in the “halo of possibilities surrounding measurement” (Bachelard, 2000: 76) are nudged closer to the center of public attention through often-tireless ethical work of individuals committed to an issue. This is not, however, accomplished through an ‘institutionalized habit of thought’, but rather an individual habit of action that operates along the ambiguous edge of understanding, generating agreement and bypassing direct communication between the government and the public. Chris and other activists I encountered have taken upon themselves this burden of humility, channeling representations of the changing climate through persistence and creativity in the face of resistance and indifference.

**precipitate, v.:** To fall suddenly or violently *into* a particular state or condition.  
**Etymology:** Latin < *prae-* PRE- + *caput* HEAD.

Despite government acknowledgement and the successful efforts of local activists, widespread concern for sea level rise in the Keys still appears to be a distant goal. Universal comprehension will result from either gradual understanding or by way of a powerful experience that causes a sudden realization that the climate is changing quickly and irreversibly. Either way locals will be forced to reconsider the temporal trajectories of their lives in the context of the Keys and climate change more broadly. Hurricane Wilma has already had such an impact for a number of locals including Chris, Annalise Mannix, Andy Devanas and Billy Causey, who all involved themselves in sea level rise-related activism and mitigation efforts in the aftermath of the storm. However, these individuals all work at the front lines of the disaster in various ways: Chris and Billy work in conservation, Annalise was Key West Emergency Manager and Andy is a weather forecaster. These positions provide a different perspective of the event as they all require a certain attention to climate that the average local may not

possess. For most residents, the event of Hurricane Wilma fit neatly into a well-established category of disaster to which locals were already accustomed and it was implausible for most to consider this hurricane as indicative of a changing climate. Despite the fact that its storm surge would have been greatly reduced if sea level had not been rising at post-industrial levels, Wilma was perceived as a separate disaster, much more sudden, tangible, and justifiable. The storm fit too well into preconceived notions of catastrophe to have created the temporal jolt required to shake most locals from their disregard for climate change. Deleuze offers some insight into the dynamics of this interruption through his third synthesis of time, which manifests through the occurrence of a caesura, described as “the image of a unique and tremendous event, an act which is adequate to time as a whole” (2001: 89). This caesura creates a new temporal series by delimiting ongoing experience into a distinct ‘before-the-event’ and a distinct ‘after-the-event’ that are fundamentally unequal so that the existing sequence of linear time must restart. This immobilizing encounter “unites all the dimensions of time, past, present and future, and causes them to be played out in the pure form” (Deleuze, 2001: 115). It is an event that, in the present, changes the rhythm of the remembered past as well as the rhythm of the anticipated future. For the vast majority of Keys residents, the idea of sea level rise has not yet created a caesura, by which they would be forced to recalculate in the present their future lives in the islands, taking on the prospect of inhabitability and all of its implications.

The activists mentioned above were among the residents who experienced this interruption both early and forcefully and now they are, to various degrees and with differing success, attempting to incite a widespread re-calculation of time throughout the Keys, inciting a “politics of temporal regime change’ (Brown, 2005: 332). These moments of revelation must be powerful enough to propel an individual towards action, whether that action is moving out of the Keys, modifying a home to

accommodate sea level rise or advocating for mitigation, forcing them to “transmit the reality of the shock” so that the individual’s “body has become an expressive event” (Massumi, 2002: xxxi). Bennett describes this phenomenon as one possible manifestation of ‘enchantment’, understood as an affective event through which an individual “participate[s] in a momentarily immobilizing encounter” (Bennett, 2001: 5) in which he or she experiences a certain captivation with a present situation. Enchantment requires a particular combination of wonderment and alarm; it is a situation in which one is fascinated but also “disturbed to find that, although your sense-perception has become intensified, your background sense of order has flown out the door” (Bennett, 2001: 34). The phenomenon of enchantment draws on the virtuality of the present: it occurs when the thoughts, signs and other abstractions indicative of the past and future fade into the background and our attention is drawn in closer to the immediacy that surrounds us. These overwhelming interruptions arise from a pre-reflective field of asignification, from the ‘before’ indicated by the present’s etymology, which is sensed without the abstraction of thought. In this more intensive present, we are immobilized through an unintended lapse into the virtual that enfolds difference into the subject, bypassing the system of reasoning usually required for significant subjective changes and offering direct access to the creative present.



**Figure 33.** High tide, Big Pine Key 2009 [photo: Alison Higgins]

A responsiveness to these “surprises that temporarily jar humans out of the stupor of their duly sequential representing and recognizing” (Bennett, 2001: 53) is crucial to the ability to undertake the comprehensive ethical project involved in precipitating and enacting a county-wide temporal regime change. Ethics in this case, does not conform to a moral code, but is rather a “pragmatic question of how one *performatively* contributes to the stretch of expression in the world... since it is to ally oneself with change” (Massumi, 2002: xxii). Proponents like Chris, at the frontlines of mitigation and awareness raising, have allied themselves with the changes they see the Keys undergoing, which is not to say that they *want* the Keys to disappear, but they see that this is going to happen and are affected to the extent that they can neither resist nor ignore these changes. According to Bennett, “an ethical politics requires more than rational demystification” (2001: 129), a point that is clear as the Monroe County government works to draft the new Comp Plan with its acknowledgement of climate change. This is not a routine and conclusive process, but rather one that attempts to reconcile multiple understandings of sea level rise, which are based on individual encounters with the ocean, the climate and the scientific information that frames these expected changes. Jasanoff encourages governments to “engage the human subject as an active, imaginative agent” (2003: 243); likewise, de Goede and Randalls identify “a poverty of political imagination” that “fails to foster the enchantment that, according to Bennett, may be required for ethical engagement with the world” (2009: 874). Legislation therefore must be accompanied by ‘allies of change’ as it works its way along affective pathways through various levels of government. The efforts of activists “infuse the ethos of politics embedded in institutional settings one way or another” (Connolly, 2011: 5) so that through their work in the Keys, local sensibilities have been altered to the point that the county government itself is compelled to adopt and promote a new temporal series for the islands. It is a situation in which a number of

individual caesurae, and Chris's in particular, have forced a tentative bureaucratic caesura.

**present, n.:** The present time; the period of time now occurring

**Etymology:** Latin < *prae-* PRE- + *esse* TO BE.

Politics, Grosz tells us, is “untimely” (2004: 186); it draws its force from Deleuze’s atemporal caesura in that it arises from a “space of *passion*” (Massumi, 2002: 61, original emphasis), which is “best understood less as an abstract space than as the time-stuff of spatial abstraction” (2002: 61). Politics unfolds through a space of susceptibility to the present and seeks to transform the atmosphere of signification surrounding that present itself. While the work of activists is conventionally political in that they are involved directly with the local government in enacting climate change policy, their motivation and actions emerge through the unbounded creativity of relational ethics. As Grosz explains, “Politics is an invention, a labor of fabrication, of experimentation with the unrepeatable and the singular, that links it more to intuition, to artistic production and aesthetic discernment than to planning, policy, or the extrapolation of existing relations” (2004: 260). Chris, for example, in each meeting he attends, each interview he gives and each business owner he approaches with his flood maps, is transmitting his own shock at the reality of climate change as he seeks to resignify the Keys’ present. However, he is not entirely motivated by fear of the Keys’ inevitable future, which “will not be calm and intensify perception but only shut it down” (Bennett, 2001: 5), but rather has made the ethical choice to ally himself with the next century’s anticipated changes, an effort that results in “the production of a future that actively transforms the dynamics of the present” (Grosz, 2004: 186). Through this work, new pathways are created through which the established past is connected with the unresolved future, transforming the phenomenon of climate change into both a *significant* and *present* occurrence.

I have adopted the term 'presencing' to describe how climate change, can be reified through an 'anticipatory object' like a policy document while still possessing an "uncertain imminence" (Leyshon and Geoghegan, 2012: 240). 'Presencing' "refers to the capacity for sensing, embodying and enacting emerging futures" (Leyshon and Geoghegan, 2012: 243) and describes the process through which we individually and collectively understand the dimensions and extent of the present at any given juncture. This present semiotically includes the future, sometimes through the existence of 'objects' but also through less material abstractions such as experiences, information and encounters. The present is the dynamic average between felt virtuality and formed reality, a point that I made in Chapter Three when discussing germinating futures, and it is therefore inclusive of both the pre-representative, nonspatial "abyss" (Morton, 2013) from which enchantment emerges as well as the material world as we physically perceive it. The past and future are produced through signs that structure experience in such a way that "the flux of it no sooner comes than it tends to fill itself with emphases, and these salient parts become identified and fixed and abstracted; so that experience now flows as if shot through with adjectives and nouns and prepositions and conjunctions" (James, 2003: 49). These signs 'shot through' experience are not only actualized representations but also dynamic additions to the present, as, according to Deleuze, "It is not that the present is a dimension of time: the present alone exists. Rather, synthesis constitutes time as a living present, and the past and the future as dimensions of this present" (2001: 76). Consequently, there is only the present and signs, the meaning of which continuously change as they adjust in relation to each other, shaping the form in which the present passes. The future and the past are thus *atmospheric*, forming an atmosphere of signification around, and emerging from, the enduring present. Semiotic currents of the past and future, "as habitudes or contractions referring to one another" (Deleuze, 2001: 77), materialize, blend, assemble and

dissipate using the virtual present as an inexhaustible material reference. The perception of a stable past and a predictable future, however, provide an essential grounding for this present, as without these abstractions “there is no leverage, no purchase, with which to regulate the course of experience” (Dewey, 1958: 13). The semiotic atmosphere surrounding the present provides this purchase by supplying signs which support experience and through which we can engage in the process of presencing, creating temporalities that structure worlds. “Presencing”, according to the OED (2015), is a process of “summoning” the signs that give rise to particular futures and, by extension, particular pasts, a process of continuous reckoning, alignment and adjustment.

Effective activism in relation to sea level rise involves encouraging neither fear nor mass exodus but promoting acceptance of the dire situation that is facing Keys residents. Local activists are “emotionally connected to the environment” (Halvaksz and Young-Leslie, 2008: 187); they are susceptible to perceived changes in their surroundings and therefore have a particular connection and responsiveness to the changing present. Ideally, they must attempt to persuade residents to be aware of the prospect of sea level rise, to make plans to deal with it at both a personal and bureaucratic level, and then to accept their circumstances so they can enjoy their remaining days in the Keys. One of the major ideas articulated in Spinoza’s *Ethics* describes how, through a concerted effort of cognition, we may come to accept ‘substance’ in any form, however disagreeable, and discover what he calls ‘joy’ in its continuously changing present. Likewise, perhaps, the most effective mitigation advocates seem to discern and understand the acute and twofold vulnerability Keys residents are experiencing but grant these formidable futures a certain degree of acceptance. This arises from a susceptibility to enchantment, considered a surprise but also “a comportment that can be fostered through deliberate strategies” (Bennett, 2001:

4). Bennett encourages us to pursue a life that “provokes moments of joy, and that joy can propel ethics” (2001: 4), resulting in a commitment to personal endeavors less for the rewards or power that may come of this commitment and more out of a resolve to continue the cultivation of positive affects. In other words, it may be possible to enact change to a greater degree by attuning to the joyful resources of the present.

This idea was apparent, though perhaps misunderstood, in one particular speech Chris delivered to a regional, rather than local, audience. Monroe County signed on to the Southeast Florida Regional Climate Change Compact in 2010, joining the three other counties of south Florida in a unified action plan for sea level rise mitigation and adaptation. Monroe County hosted the annual Southeast Florida Regional Climate Leadership Summit in 2011, welcoming delegations from across south Florida for three days of workshops, presentations and networking and the unveiling of a new Southeast Florida Regional Action Plan. Chris was invited to address participants at the compact’s main event and his talk began with an introduction to the diversity and value of the coral reef extending the length of the Keys, which is in extreme danger due to climate change. Humans are not at risk, Chris emphasized: “even in the most rapid scenarios people won’t notice.” But nature, infrastructure and property will start to change soon and, he explained, “we need to mitigate so we don’t have to adapt so much.” He ended by telling everyone that all of south Florida needs to “prepare for some inevitable change... perhaps significant inevitable change”. Before leaving the stage he added, optimistically, “I hope we will all be able to stay here as long as we can”. Chris was followed by County Administrator Roman Gastesi and the first words out of his mouth as he took over the microphone were “That was a little heavy”. Not everyone shares Chris’s optimism for the continued habitation of the Keys, yet this seems to be the ultimate message he is trying to convey: if the county undertakes some challenging bureaucratic and infrastructural work now residents will

be able to enjoy the rest of their time in the Keys. In relation to climate change in Florida, in particular,

The messages that scientists send to policy makers must be honest, but should avoid purveying doom and gloom. The ancient wisdom of crisis being equivalent to opportunity is highly pertinent to the problem of sea level rise. Sea level rise might be portrayed as a disaster, and of course in many ways it is. But an alternative and equally honest portrayal is that sea level rise is a challenge that society must use its best intelligence and ingenuity to confront (Noss, 2011: 13)

Sea level rise mitigation advocates in the Keys are calling for a foregrounding of this intelligence and ingenuity through legislation, awareness and action in hope that sea level rise will become a less frightening and more engaging prospect.

The Keys' experienced present can be subjectively modified if residents choose to grant their attention to signs indicating not only that sea level is rising but that every effort is being made at a bureaucratic level to ensure the continued inhabitation of the islands. This is as much an affective process as it is a governmental process, involving impactful events, encounters and performances as much as the drafting of legislation. According to Deleuze, the present "instantaneous state always envelopes an increase or a decrease of power" (1981: unpaginated), and he defines these changes in power as affects themselves. Negative affects, or what Spinoza calls sadnesses, involve "a kind of investment... Everything happens as if a whole part of my power is no longer at my disposal" (Deleuze 1981: unpaginated). In the experience of joy, on the other hand, we encounter something that agrees with our relations and "the two things of which the relations are composed, form a superior individual" (Deleuze 1981: unpaginated). Effective acceptance and mitigation of sea level rise in the Keys requires the widespread formation of a collective 'superior individual' willing and able to tackle these changes head-on. Through the process of reasoning, Spinoza tells us, we can generate the "power of rightly ordering and concatenating the affections of the body" and can "preserve ourselves from being easily affected with an evil emotion" (Spinoza [Eliot])

1981, 224). In this way, we can subjectively synthesize time by shaping the contours of existence in such a way that our premeditated perceptual adjustment to 'joys' and 'sadnesses' change the temporal atmosphere around the present, according to each individual perception. When Chris says things like "I hope we will all be able to stay there as long as we can", "living in the Keys is a reasonable risk to take" and "It shouldn't be presented as a situation in which to panic", he is attempting this "alternative and equally honest portrayal" (Noss, 2011: 13) of the effects of sea level rise. While there is much for locals to be sad about concerning the eventual disappearance of the Florida Keys, there is still much to appreciate as well as the time in which to appreciate it. The problem remains to calibrate the message so that it isn't quite so "heavy", so that it creates an adequately powerful yet sufficiently optimistic interruption that will not result in a large-scale negative investment of power.

**comprehend, v.:** To lay hold of with the mind or senses; to take in, comprise, include, contain.

**Etymology:** Latin < *com-* TOGETHER + *prae-* PRE- + *hendere* TO GRASP.

The choice to live near the ocean generates a particular lived experience, one that encompasses leisure, relaxation and vulnerability in equal measure. There is a popular window decal displayed on vehicles throughout the Keys that reads 'Salt Life' in a rough scrawl, and although these stickers advertise a well-known American surfing company they simultaneously demonstrate a certain enchantment with and pride in a life lived on the ocean, particularly considering that the reef prevents any real wave action that would enable locals to surf. They evoke the ever-present smell and feel of salt water, time spent on boats and in the ocean, and the pleasant weather that facilitates these pastimes throughout the year. Yet there is also an inevitable component of disaster that accompanies this salt life, particularly in tropical regions where storms and flooding are very real facets of life on the ocean. Lehman, in her study of the effects of the 2004 tsunami in Sri Lanka, examines what it means to 'expect the sea',

concluding that both the effects of the tsunami and the reality of climate change, much like the relationship between sea level rise and hurricanes in the Keys, are “elusively unbound, sliding into one another through the observations, governance practices, and political manipulations of a changing ocean” (2014: 11). Natural disasters are part of what it means to ‘expect the sea’ and are accompanied by a broad commitment to “live with the unexpected: to acknowledge uncertainty while never being able to fully account for it” (Lehman, 2014: 11). This is true of life in the Keys, whether that uncertainty pertains to sea level rise, hurricanes or both, and it creates a situation in which “Governing the future begins from an equation between the space-times of life and contingency” (Anderson, 2010a: 792). We inhabit a present alive with an atmosphere of signification that shapes the temporal frameworks under which we operate and “the issue of living depends upon the art with which these things are adjusted to each other” (Dewey, 1958: 76). The job of the CCAC and the Board of County Commissioners is therefore to adjust the seemingly concrete realities of today with the signs indicating a divergent, but not necessarily cataclysmic, future. Sea level rise has become a problem the county can no longer ignore and it is trying to modify and contribute to this atmosphere of signification, a process that requires a “complex temporal articulation between present and future tenses, between reliable knowns and unreliable unknowns, between proven evidence and unproven theorizing, clarity and doubt, immanence and postponement, immediacy and deferral” (Brown, 2005: 336). Governance, in other words, is ultimately an ethical endeavor, accomplished through logical and affective connections made, promoted and reinforced by individuals, making the government more a “distributed architecture of experience” (Massumi, 2011: 52) than a clearly-defined practical and functional body. The articulation of policy is an ethical puzzle, enacted through this interpersonal and affective architecture

and addressed through the movement of bodies in space as they create new realities while forging novel connections between the reliable and the unreliable.

I have taken the unusual step in this chapter of using George Eliot's little-known translation of *Ethics* for the few Spinoza quotes cited. Eliot was the first person to translate this work into English in 1856 and although it was not published during her lifetime due to a conflict with her publisher, it was eventually edited in the late 1970s as part of a doctoral thesis by Thomas Deegan, resulting in a very limited publication by the University of Salzburg in 1981. I chose to use her translation out of simple academic curiosity combined with the conviction that women are grossly under-represented in philosophy, and although it is generally similar to other translations, my interest was captured by her commitment to the word 'concatenate' and her unique choice to adhere so closely to the original Latin word *concatenatio* in contrast to Spinoza's other English translators. In Eliot's rendering, for example, Spinoza tells us, "So long as we are not agitated by emotions which are contrary to our nature, we have the power of ordering and concatenating the affections of the body according to the order of the intellect" (Spinoza [Eliot], 1981: 224). Samuel Shirley, on the other hand, chose to translate "ordering and concatenating" as "arrange and associate" (Spinoza [Shirley], 2002: 369; see also Spinoza [Elwes], 2009), while Edwin Curley chose "ordering and connecting" (Spinoza [Curley], 1994: 250). 'Concatenate', meaning "to connect like the links of a chain" (OED, 2015), evokes a sense of continuity that is absent in the words 'connect' or 'associate'. A chain continues in a series past a single connection or association, and this concept of extension is crucial to retain in a consideration of *Ethics*, particularly when reading Spinoza through Deleuze, as 'concatenate' is a word that more clearly evokes the repetition that is so elemental in his synthesis of time. The past and future are arranged around the present through a shifting atmosphere of linked signs, and it is in the virtuality of the present that a

repetition is taken up or abandoned, continuing an existing temporal chain or beginning a new series following a caesura. The present is therefore catenary: it hangs in the abyss between signs that evoke particular pasts and particular futures and, through an effort of mind, Spinoza tells us, we can select the signs on which this present is suspended in order to orient our perception to experience 'joy' more consistently. Our knowledge of the past and future, as dimensions of the present, is not the result of singular associations, but rather chains of meaning that extend through us as subjects. This idea, in fact, emerges through Deleuze's study of Leibniz, who thought much of the catenary curve that a hanging chain assumes under its own weight, having been one of the first mathematicians to figure out how to calculate its arc.<sup>24</sup> Following Leibniz, "concatenations of syllogisms or definitions are a 'fabric,'" (Deleuze, 1993: 49) much like the infinite folds of fabric implied by Baroque art. The folds, or the points at which a chain is hung, give form to the fabric of climate change through the process of reasoning and connection so that "knowledge is known only where it is folded" (Deleuze, 1993: 49). In *Ethics*, Spinoza identifies three types of knowledge, the third of which he refers to as 'intuitive cognition', which constitutes the "highest effort and the highest virtue of the mind" (Spinoza [Eliot], 1981: 232). While his first type of cognition lacks a rational order, and the second type involves the formation of 'adequate ideas' through the process of reasoning, the third type of cognition comprehends the necessity and nature of existence as well as the inevitability of change. From this intuitive cognition "arises the highest possible repose of mind" (Spinoza [Eliot], 1981: 233), a knowledge through which a local resident or sea level rise activist may become an ally of change, capable of accepting the prospect of catastrophic climate change while simultaneously appreciating the Keys while they remain inhabitable. Sea level rise as it pertains to the Florida Keys is a process in which landscape and residents alike are not

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<sup>24</sup> See 'Two Papers on the Catenary Curve and the Logarithmic Curve' (Leibniz 1691).

undergoing transformations but rather “reconcatenations” (Deleuze, 1993: 115) as their chains of meaning are being reformed and rearranged in concert with the growing reality of a changing climate. For Spinoza, knowledge is a process of feeling as much as it is a process of reasoning; it is an affective resonance that connects the objects of knowledge more firmly to the subject, ideally to the point of universal acceptance of the world in whatever condition.



Figure 34. High Tide, Little Torch Key [photo: Alison Higgins 2009]

**preliminary, *adj.*:** Preceding and leading up to the main subject or business.

**Etymology:** Latin < *prae-* PRE- + *līmen* THRESHOLD.

By presenting a particular view of the Keys’ future, as well as an appreciation of their passing present, Chris is taking a standpoint on the islands’ vulnerability that is more of an “affirmation of this condition without existential resentment” (Connolly, 2011: 6). By focusing here on the affective malleability of the present and the opportunity to shape its substance through our efforts of cognition, I have attempted to de-emphasize the criticality of climate change in order to promote an alternative narrative because, according to Bennett, “An enchantment tale disrupts the apocalyptic tenor of the news and the despair or cynicism that it breeds” (2001: 160). This is not to dismiss the very real concerns of Keys residents as their livelihoods, investments and social networks are at stake, but rather to find a way to come to terms with a world that

appears, as Deleuze tells us, to envelope a decrease in power as the Keys are gradually overcome by the ocean. Climate change “means something ontologically scary about our world” (Morton 2013, 48) but it also provides an opportunity to “narrate modernity in a way that heightens the experience of wonder within it” (Bennett, 2001: 15). And this narrative is increasing in volume as various ‘allies of change’ create affectively-imbued chains of meaning that are gradually leading to a more widespread comprehension, and ultimate acceptance, of climate change. Politics operates not through the construction and implementation of policy, but through a “derangement of the present order, a movement of rendering its order insecure and replaceable” (Grosz, 2004: 186). When ethics concerns itself with how we manage the idea of change in the passing present, politics emerges as an ethical artistry immanent to a present that provides not only the raw material *of* change but also the opportunity and impulse *to* change.

Perhaps a National Public Radio story from November 2013 provides some evidence that the Keys’ present order has become increasingly deranged in the time since my final field visit (Allen, 2013). The report describes Key West as “leading the way in preparing for a watery future” and features Chris discussing the potential decline in property values and “the risks associated with living near the ocean”. Yet it also includes commentary from Key West Planning Director Donald Craig who discussed updated ordinances requiring new buildings to be constructed with living space beginning at 1.5 feet above FEMA’s ‘base flood elevation’ and for each building to incorporate a sizeable fresh water cistern in anticipation of increasing infrastructural challenges to the 154 mile pipeline through which potable water is delivered to Key West from a mainland aquifer already compromised by rising seas. Craig explained that they are “in all senses of the word vulnerable to sea level rise” adding that “the reality is, sea level is going to rise, we have to prepare for it and this is one of the ways we can

do that". The success of these building codes remains to be seen as, in the past, developers have easily been able to find loopholes in these regulations and many residents choose to avoid renovating their homes in order to sidestep requirements to retrofit existing structures. Craig is confident, however, that despite upcoming challenges "people will want to continue to live by the water". "If the Dutch can adapt" he says, citing their costly barriers against the North Sea, "then we can adapt". This attitude is considerable coming from a local official and may indicate that the signs of sea level rise are becoming not only more urgent and unavoidable but also that locals are becoming more accepting of the changes to come. Yet this development is not surprising considering the progress made between 2009, when Chris first 'threatened' the county government to begin taking sea level rise seriously and 2011 when the county government was in the process of drafting legislation officially recognizing sea level rise. This, of course, is the nature of transition: it occurs in a present that continuously shifts and changes as it is transformed through material and ethical entanglements.

As the Comp Plan itself observes, the Keys can anticipate increasing floods, erosion and inundation in the coming years and "A great area of uncertainty is the combination and interrelationships of these impacts in the future" (Monroe County 2014, 248). Our present shifts to accommodate this continuous uncertainty, and I have aimed to engage with the ethical processes that align and realign this present through the circulation of affectively imbued signs. As Bergson explains, we "define the present in an arbitrary manner as *that which is*, whereas the present is simply *what is being made*" (1991: 150, original emphasis); it is a permanent threshold, the liminal space between things through which change continuously occurs. Ethics is not a set of rules but rather "the generous mood that enables one to reconsider them in the face of new and surprising developments" (Bennett, 2001: 29), a mood that provides the

motivation, the effort and the flexibility required to foster an attitude of acceptance and adaptation during what is likely to be the final years of the Florida Keys' inhabitability. To comprehend, according to the word's etymology, means 'to grasp before, together', and Monroe County's Comprehensive Plan with its preliminary acknowledgement of climate change signals that a widespread 'grasping' may be underway. As sea level rise achieves greater presence in the Keys through accumulating signs of its dire immediacy, commissioners and residents alike are forced to undertake a subjective journey "through an inner space that is hard to traverse" (Morton, 2013: 184) as they accept the fate that awaits the island chain. At the end of this journey they will arrive at a way 'to be, before' in a present poised on the edge of catastrophe; they will arrive, in other words, at another threshold.



**Figure 35.** High tide, Big Pine Key [photo: Alison Higgins 2009]

## RAIN

I opened my eyes  
And looked up at the rain,  
And it dripped in my head  
And flowed into my brain,  
And all that I hear as I lie in bed  
Is the slishity-slosh of the rain in my head.

I step very softly,  
I walk very slow,  
I can't do a handstand—  
I might overflow,  
So pardon the wild crazy thing I just said—  
I'm just not the same since there's rain in my  
head.

- (Shel Silverstein 1974)

## Chapter Six: Memorial persistence

### I.

*The hurricane arrived* in August, 2011, as my family and I were in the process of moving from the U.K. home to Vermont. The storm was moving quickly up the east coast, a Category 1 hurricane expected to make landfall in New York. We were staying temporarily on a remote mountain accessed by two miles of winding dirt road and we spent some time the day before securing items in the yard, expecting moderate wind damage and a possible utility disruption. Power outages and road closures are routine in New England during the harsh winter: a foot of snow can easily leave Vermonters housebound without phone or electricity for several days. But so far inland, and so accustomed to weathering these events in relative isolation, there seemed no reason to panic *when the hurricane arrived*.

*The hurricane arrived* on an unassuming late-summer morning, warm with a light rain. My husband left the house early and I took our son outside to play in the puddles, unconcerned by the minor downpour. Yet soon the rain grew heavier and we were forced inside, drenched through our raincoats and boots. We watched anxiously from the windows as the weather became more alarming: the torrent was not only surprisingly heavy but relentless and unceasing. The lawn disappeared under a muddy, rushing river and deep channels were cut into the gravel driveway. Before long, the power went out and we sat in the dim house for several hours, watching the world around us flood *as the hurricane arrived*.

*After the hurricane arrived*, we ventured cautiously outside to assess the damage. The road up the mountain had been washed away completely in several places, making it impossible for a vehicle to pass. Visits to neighbors revealed universal panic and confusion. In the early evening, my husband finally returned home, having

made his way up the mountain through the woods, avoiding chasms newly cut in the roads. He never arrived at his destination that morning, instead waiting out the storm in a bar that was kind enough to open its doors on a Sunday morning to a number of stranded motorists. They sat for hours drinking warm beer in the dark until the waters receded from the submerged streets. He finally drove back to the bottom of the mountain, convincing emergency crews to let him pass over paved roads left barely intact after *the hurricane arrived*.

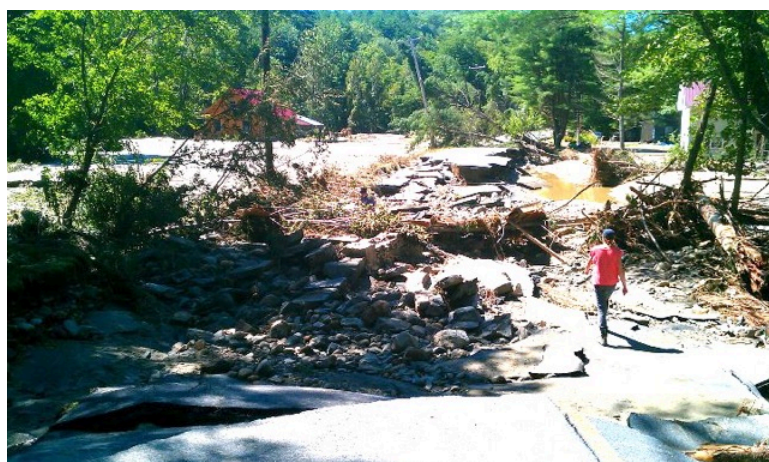
## II.

*This remarkable coincidence* occurred during a respite between fieldwork trips spent researching hurricanes in the Florida Keys as I returned home to Vermont just in time to witness my own town ripped apart by the remnants of Hurricane Irene. Over a hundred homes were washed away throughout Vermont, along with countless roads and bridges. Thirteen towns in the small state were isolated for up to a week and the National Guard had to airlift supplies to stranded residents. Although Irene had weakened to a tropical storm by the time it travelled 200 miles inland, it brought the worst flooding since a similar and largely forgotten hurricane in 1938. My first-hand experience of Irene underscored the stories of loss, shock and agonizing recovery I had gathered in the Florida Keys, intensifying my research by way of this hurricane's *remarkable coincidence*.

*This remarkable coincidence* is emphasized by New England's limited hurricane history. Catastrophic storms make landfall in the northeast only every century or so, compared to the Florida Keys, which have a one in seven chance of being directly hit by a major hurricane in any given year (Jordan, 2007: 16). According to soil records New England has suffered only six notable landfalls since the 14<sup>th</sup> century (Donnelly et al, 2001); the Keys, on the other hand, were affected by 5 storms in 2005 alone. Hurricanes on the scale of Irene are a particularly unusual occurrence so far from

shore, with Vermont having experienced a 73-year respite since the 1938 storm caused extensive flood and wind damage throughout New York and New England. That Vermont should experience its next hurricane during a time when I was acutely interested in these massive storms is a *remarkable coincidence*.

*The remarkable coincidence* driving this narrative is the singular event of Hurricane Irene, yet the story of a catastrophic storm is rarely limited to a single disaster but rather amplified through its subjective resonance across time and space. As “dissident vectors” (Guattari, 2000: 45), hurricanes form outside the field of human involvement, their arrival is difficult to predict and even after landfall they remain idiosyncratic. As such, a hurricane is a haecceity, an ungraspable element of the environment, or as Guattari explains, “an incorporeal... something that cannot be located in time and space, but which was born on a certain date and which will be effaced” (2011b: 52). Hurricanes often strike unpredictably and with surprising strength, producing drastic changes in the natural environment, local communities and affected individuals alike. After the storm, damages are assessed, repairs are made, the event is processed, and then its sensory force slips away, diminishing the affective immediacy of what had been a *remarkable coincidence*.



**Figure 36.** Dover Road in South Newfane, VT, after Hurricane Irene [photo: Luke Stafford]

### III.

Guattari's concepts "*crucially depend upon actually being put to work*" (Stengers, 2011: 141), having been created not for theoretical application alone but in the interest of unrestrained proliferation and exploration. Stengers calls his ideas 'operative constructs' because they require users to involve themselves in "experimenting with new tales and modes of intervention" (2010: 141). Guattari's work, in other words, provides an ethical methodology through which to deliberately participate in the making and remaking of the singularity of Hurricane Irene through the cultivation of new relationships, connections and affinities. In this chapter I am putting Guattari's concept of ecosophy to work to engage the storm as an event that is both inexpressible and limitless. Ecosophy is an "ethico-political articulation" (Guattari, 2000: 28) between three mutually influencing ecological registers: the natural environment, social relations and the individual human subject. This relational concept understands subjectivity as always collective, with affective intensities forging transversal links between often-diverse elements spread across the three registers. Through these connections, circumstances in one ecosophic register resonate in the others, so that ecology not only "questions the whole of subjectivity" (Guattari, 2000: 52), but is accompanied by an imperative to prolong and experiment with the expression of an event because operative constructs *crucially depend upon actually being put to work*.

Ecosophy *crucially depends upon virtually being put to work* in that it aims to generate an ethical responsiveness that expands upon a singular event without claiming any representative powers over it. Hurricanes with their surprising force and destructive potential, are prepersonal 'ecosophic objects', through which subjectivity as a machinic process can be mapped in any conceivable manner or direction. Ecosophy, as an idea specifically addressing subjectivity, is significant here because my own

existence was unexpectedly affected by two hurricanes over the course of this project. These uncanny incidents, however provocative, have proven awkward to explore, creating a theoretical problem that I've tried to partially address by embracing the idea that subjectivity is both collective and pre-personal. The remarkable coincidence of Hurricane Irene, and to a lesser extent Hurricane Sandy, are transversal to my research in the Keys, emerging as something more than just a productive coincidence. Efforts to respond to the storm must therefore be ethical in that they avail themselves of the storm's virtuality rather than simply attempting to explain its circumstances, responding to a world that always exceeds our powers of representation and sustaining rather than halting the progression of the machine that *depends upon virtually being put to work*.

As ecosophy *depends upon actually being put to work*, I have taken up Guattari's call to "re-learn ritornello games" (1996: 165; see also McCormack 2010). Prompted by the idea that "an environment responding to chaos gives rise to a "chaos-rhythm"" (Dosse, 2011: 253), this chapter is the outcome of a semi-poetic narrative experiment using refrains. In responding to the chaos of Hurricane Irene, this game aims to produce an experience as much as an analysis, calling attention to the process through which subjectivity continues to reorganize in the wake of the storm. As Guattari explains, "ecosophy will lead us to reinvent the relation of the subject to the body, to phantasm, to the passage of time... Its ways of operating will be more like those of an artist" (2000: 35), eschewing basic understanding in the interest of creating a novel expression driven by an event. Ideas must be accompanied somewhere regardless of outcome, a process he describes as setting a machine in motion that is attempted here through a game that cultivates a necessary ethical responsiveness to a world that always exceeds our abilities to capture it. His concepts require us to create something perceptually inventive and ultimately experiential as they *crucially depend upon actually being put to work*.

#### IV.

A poem is a “*momentary stay against confusion*,” according to Robert Frost, himself a notable Vermont resident, who wrote one of the most celebrated refrains in American poetry in ‘Stopping by Woods on a Snowy Evening’. Frost’s words on confusion were quoted by the executive director of the Vermont Humanities Council to explain the proliferation of art in the state following Hurricane Irene. The creative process, he explained, helps the individual cope with the experience “in a tentative way” (Lindholm, 2012), so that art, much like philosophy, is an effort to “enframe chaos” (Grosz, 2008: 9). The refrains in this chapter, therefore, attempt to impose a sensory structure on Hurricane Irene as a chaotic force and an event in excess of itself. By narrating a chaos-rhythm into the lingering aftermath of the storm, Hurricane Irene is enframed briefly against its ongoing chaotic trajectory, generating a *momentary stay against confusion*.

*This momentary stay against confusion* is a deliberate effort towards “sensible finitude” (Guattari, 1995: 112) in response to the storm’s chaos; it is a representation drawing on and participating in the storm’s continued creative potential. As Frost tells us in *The Figure a Poem Makes*, written a year after the 1938 Hurricane also decimated the state, “a poem can have wildness and at the same time a subject that shall be fulfilled” (2007: 131). It is a sensory anchor in a flow of change and although it results in a seemingly concrete composition, a poem must be allowed “the greatest freedom of the material to move about in it and to establish relations in it regardless of time and space, previous relation, and everything but affinity” (Frost, 2007: 131). The storm left physical destruction in its wake as much as it left sensations, impressions and other affinities resonant through the experience of Hurricane Irene, giving rise to this *momentary stay against confusion*.

*This momentary stay against confusion* is assembled through the prolonged machinic force of the storm, along the “point of negotiation between complexity and chaos” (Guattari, 1995: 111). This poetic effort extracts from and simultaneously participates in the passage of the storm, deploying refrains that carry the hurricane in a slightly new direction by way of this chapter’s unusual structure as much as its attempt to enframe the storm through the concept of ecosophy. According to Frost, “Like a piece of ice on a hot stove the poem must ride on its own melting” (2007: 131): poems are expressions that move along with the world while also attempting to move the world in a small way. The hurricane is likewise transported elsewhere through continuing refrains, for “Every time an event migrates, it is re-conditioned” (Massumi, 2002: 81), becoming a novel sensible experience along a continued machinic line. In the end, regardless of the effect of these refrains, “Its most precious quality,” Frost says of a poem, “will remain its having run itself and carried away the poet with it” (Frost, 2007: 131), leaving in its wake *a momentary stay against confusion*.

## V.

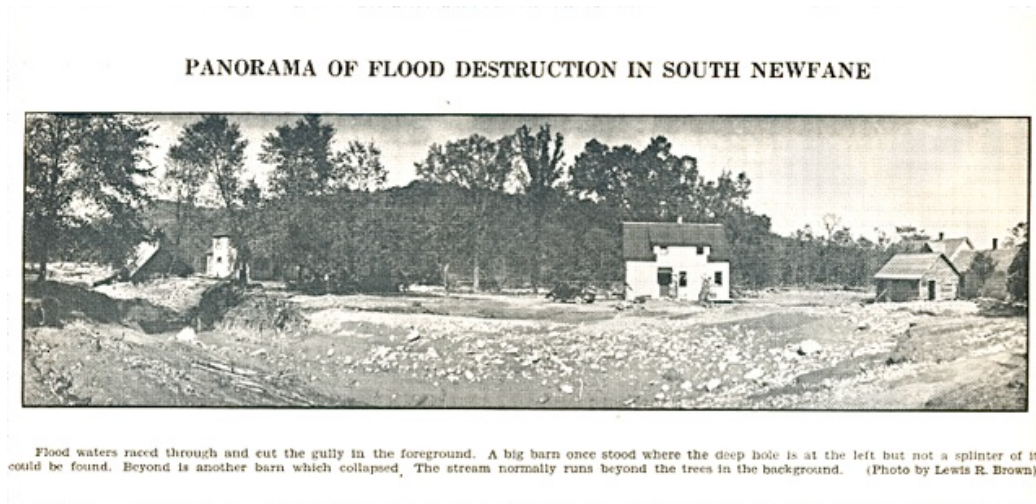
*A disturbance in the atmosphere* was first recorded by a ship south of the Cape Verde Islands on September 9<sup>th</sup>, 1938. Gaining speed in the following days, the loosely organized storm grew stronger, developing the central rotation characteristic of a tropical storm as it travelled across the Atlantic and strengthening to a powerful hurricane as it neared the Bahamas. Here, encountering pressure from a strong upper-air trough extending southward across the Eastern seaboard of the US, the storm suddenly redirected northward. As it progressed, a second high pressure system near Bermuda prevented the hurricane from travelling out to sea as predicted. Feeding off the winds of these other two strong systems, the storm’s rotation was strengthened and its speed increased to 70 mph, which remains the highest forward speed ever recorded for a hurricane. As it travelled up the coast, it was forced westward by the Bermuda

system and it “veered inland and smote the North Atlantic seaboard” (The Brattleboro Daily Reformer, 1938: 1), making landfall on Long Island, New York, with a devastating storm surge. A number of seaside communities in its path were utterly destroyed by this unparalleled *disturbance in the atmosphere*.

*This disturbance in the atmosphere* continued northward over land so rapidly that the temporarily calm conditions caused by the passage of the storm’s eye were recorded as far inland as southern Vermont. At such a remarkable speed, the hurricane covered the distance between Long Island and the Canadian border in only a few hours, finally transitioning to an extratropical storm as it left the U.S. but not before killing 680 people throughout the region and destroying roads, bridges and homes across Vermont (Emanuel 2005, 159). In the short time it took for the storm to die out over land, as many as a quarter billion valuable trees “fell like jacksaws and defied enumeration” (The Brattleboro Daily Reformer, 1938: 1). According to a local newspaper, “The value of trees destroyed was incalculable, aside from the havoc they wrought by falling” (Terrific toll, 1938: 1), with the apple and maple sugar crops ruined for a number of years by this unparalleled *disturbance in the atmosphere*.

*This disturbance in the atmosphere*, brought South Newfane, Vermont, “the most severe flood damage of any part of the county” (The Brattleboro Daily Reformer, 1938: 10), much as it would again during Hurricane Irene in 2011 when I would be stranded above the town for several days. “House after house... either fell or was badly damaged by the onslaught of water which tore out all bridges and the highway... Former residents returned to find the homes they once occupied not even in sight, wide expanses of stone, lumber and debris being scattered in their places” (The Brattleboro Daily Reformer, 1938: 10). A photo from a 1938 publication commemorating the storm shows damage identical to that wrought years later by Hurricane Irene, with the river

re-routing itself through and then behind a road full of houses, taking a number of them with it in the powerful surge. In 2011 as well, locals were stunned as they returned to survey the storm damage, their town altered enduringly by *this disturbance in the atmosphere*.



**Figure 37.** Dover Road in South Newfane, VT, after the 1938 Hurricane [reproduced from the Brattleboro Daily Reformer]

## VI.

*“The singular is exactly as it happens”* (Massumi, 2002: xxvii): it is a clear point of bifurcation, an undeniable affective intensity and a catalyst of change. A singularity is a rupture-in-process, lacking any type of reasoning or reflection, which “summons forth a creative repetition that forges incorporeal objects, abstract machines and Universes of value” (Guattari, 2000: 45). The immediacy of the hurricane rupture emerges in a story told by Rochester, Vermont, resident Jon Graham, who was inside his home when it was destroyed with little warning in Irene’s flooding. “My initial sensation as I was tossed back from the front of the house towards the kitchen,” he explained, “was simply an emotionless blur. It was as if the speed of the event was too fast for the formation of any feeling in response to it” (quoted in Daley, 2011: 106-107). These words attempt to bring us back to the real-time participation in a discontinuity, a point of unpredictability at which a definite change occurred but during which analysis was absent and the *singular was exactly as it happened*.

*The singular is exactly as it happens*; it is an event of pure sensation minus the subsequent understanding, evaluation or imagination. We can relate our experiences of the singularity, as Jon did and as I am also doing to a certain extent, but any account does little to recreate the intensity-in-process. The chaotic forces of nature are inartistic, they “cannot be lived: they are fundamentally inhuman...what we can do is extract something of these forces, nothing that resembles them, for they cannot present themselves, but something that partakes of them” (Grosz, 2008: 86). A story of the event is not the event itself, though it may call on the ongoing force of the singularity in order to convey a new set of sensations. “That passionless state of mind,” Graham continues, “was necessary for me to focus solely on the most efficient way to get out of the house that I could hear was still being torn open by the water. Though I was crawling through the wreckage of things valuable to me, none of it made any impression that could deflect my attention from the front door and the voices of my neighbors offering support” (Graham in Daley, 2011: 107). The storm in its immediacy has no analytic agency; existing at a nexus of the virtual and the actual, it is an ecosophic object, at the center of which the unexpected, unfamiliar and unthinkable can only be experienced within *the singular is exactly as it happens*.

*A new singularity, occurring exactly as it happens*, can deploy novel sensations in the wake of the storm, even if the hurricane’s initial intensity alludes us. Rather than attempting to portray this singularity with any fidelity, real or imagined, we can instead be carried away by the force of the storm as a “nucleus of chaosmosis” (Guattari, 1995: 80) through which new ecosophic configurations continue to emerge. According to Guattari, “The primary purpose of ecosophic cartography is thus not to signify and communicate but to produce assemblages of enunciation capable of capturing the points of singularity of a situation” (1995: 128). Cartography, from this perspective,

does not communicate the storm but communicates the existence and resulting influence of the singularity. It prolongs the energy of the rupture, pursuing a fidelity more to extended creation than to the event itself, while acknowledging that a *singularity can only be exactly as it happens*.

## VII.

*The content of a natural disaster is beyond capture* because catastrophic events are *surreal*, meaning that they are super-, above-, or beyond-real (OED, 2013). This word was used frequently to describe Hurricane Irene, with one witness observing, “It was so surreal. I’m here and I’m watching this, but I have nothing to compare it with. I am watching nature at a scale and level I have not seen before. I was looking at it and listening to it, but I wasn’t accepting it” (Brandon et al, 2012: 66). Another resident offered a similar description: “Those first couple of days everything seemed so surreal that I don’t think I was processing” (Brandon et al, 2012: 70-71). Likewise, another local explained that “At first it was surreal, like a movie—everyone was living on an adrenaline rush” (Brandon et al, 2012: 98). The hurricane is not a reality, but a *surreality*: it occurs in a place above, over and beyond the representable world, as an event that is experienced by the body but that also exceeds it. In the absence of capture, affinities can be developed, following Frost, connections made “regardless of time and space, [and] previous relation” (2007: 131) that partake of the disaster but preserve *its content in a place beyond capture*.

*The content of a natural disaster can never be captured*, as artist Kara Walker notes in the introduction to her book on Hurricane Katrina. She describes the months following the storm during which “the narrative of Hurricane Katrina had shifted... to a more assimilable legend.... And always at the end of these tales, reported on the news, in newspapers, and by word of mouth, always there is a puddle—a murky, unnavigable space that is overcrowded with intangibles” (quoted in Pratt, 2008: 4). A hurricane is a

“partial enunciator” (Guattari: 1995), some of which is discursively actualized, but much of which can never be as events always exceed themselves. One way this unnavigable space can be addressed is through the production of discursive expressions that retain a sense of this intangibility by feeding off the virtual energy set in motion by the hurricane machine. These expressions cultivate affinities through refrains that provide “a way of moving, a vehicle, that touches upon the affective instensities of corporeality at the same time as it touches upon or opens onto the incorporeal, the virtual, the infinite” (McCormack, 2002: 479). As an alternative to containment, affinities produce sufficiently and deliberately precarious representations that endeavor to make contact with what Whitehead has described as nature’s “ragged edge” (1978: 50) where we find a chaos to which words cannot ascribe meaning and which *can never be captured*.

*The content of a natural disaster can never be captured:* it is impossible to dialectically convey the full force of the storm, although the singularity can be developed and extended through affective currents in “a world of affinities and impacts that take place in the moves of intensity across things” (Stewart, 2007: 125). Guattari identifies a difference between expression, meaning that which is discursive, and content, which is the non-discursive transversal character of the event (1995: 60). While a hurricane can be discussed, analyzed and processed, it can never be revisited, as, according to Derrida, a “saying of the event is always somewhat problematical because the structure of saying is such that it always comes after the event....it is bound to a measure of generality, iterability, and repeatability, it always misses the singularity of the event” (2007: 446). The force of a hurricane is greater than our ability to contain it, creating an inevitable divide between the singularity itself and its portrayal, so that “there is no generalised syntax for these deterritorialisations. Existence is not dialectical, not representable. It is hardly livable!” (Guattari, 1995: 52) Although affinities can be

developed and refrained, no representation, linguistic or otherwise, can recreate the full intensity of an event's real-time sensory involvement; it is an experience that *can never be captured*.

### **VIII.**

*The expression of a natural disaster can never be completely exhausted*, and ecosophy offers a way to keep the 'ragged edge' in sight without relying on the problematic notion of accuracy to stabilize the world. It allows us to cautiously revisit the singularity itself, not returning to the moment of the event, but apprehending the event as a new event in the current present, working with nature's "unexhaustiveness" (Whitehead, 1978: 14) to *create* the world rather than simply account for it. The emphasis remains on the ongoing process of change and extension, rather than the consistency and stability of a limited event. As existence continues after the storm by way of new sensations, impulses and affinities, ecosophy invites us to participate in an existential refrain newly occurring, as part of the ever-shifting storm territory through which *the expression of a natural disaster is unexhaustive*.

*The expression of a natural disaster can never be completely exhausted*, for a singularity of this magnitude continues to resonate in unforeseen ways, long after the physical event itself has run its course. Following the 1938 Hurricane in Wilmington, VT, a flood marker was painted on the side of the police station at a height of five feet above the sidewalk to commemorate the town's complete inundation when the Deerfield River overflowed its banks during the storm. The marker is located next to a stoplight at the heavily trafficked corner of the town's main intersection. Stopped travelers, including thousands of tourists each year, have the opportunity, however briefly, to glance over, notice the sign and be affected by the extended presence of this historic storm that continues its stretch of expression each time the flood marker makes contact with a human mind. According to Derrida, a singularity is "an ongoing series of

after-the-event reprises and iterations of an event of thought about the event and its constitutive after-the-eventness” (Bennington, 2008: 34). The 1938 storm is reprised each time it is called to mind or discovered once more through the flood marker, becoming a newly iterated event in this small way each day while still failing to *exhaust the expression of the natural disaster*.

*The expression of a natural disaster can never be completely exhausted* because we can continue to experiment with different ways to work around and through the point of rupture, attempting different modes of capture that will prolong the force of the singularity even as this force is altered through diverse and varied repetition. By addressing the ‘unnavigable space’ of an event, we may be able to avoid what Guattari calls “semiotic enslavement” (1996, 22: 143). Working between the world of discursive complexity and the world of non-discursive complexity, we can generate a modest suspension along the storm’s continuity, an expression that calls attention to the refrains through which the event continues to unfold. This is an effort that involves re-enlivening the content of an event without being restricted by the need for accurate portrayal. A storm chaotically apprehended is less an attempt to represent and more an effort to *re-present*, to make present again as a minor affective experience, the passage of expression that the storm machine set in motion, which *can never be completely exhausted*.



**Figure 38.** 1938 Flood marker, Wilmington, VT (Photo: Lorianne DiSabato, 2007)

## IX.

*A strange cadence of wandering and disbelief* took hold of the sparse mountaintop community the morning after Irene. In an area where the neighboring houses are barely, if at all, visible through the dense forest, everyone was out on what was left of the roads, sharing news of damage sustained, speculating about the condition of the town below and determining the extent of food and fresh water supplies. Through this routine of frenzied information sharing we collectively established the territory of a singularity newly occurred. Between the fifteen or so households scattered across the mountain, we pieced together an initial hurricane narrative, enacted through the refrains of our *strange cadence of wandering and disbelief*.

*Wandering in disbelief*, we embarked on a long hike down the mountain, scrambling through the woods in places where the road had been damaged. We learned that at least one house had washed away in the valley below and even the main roads had been cut through by the raging river. Every so often we encountered others out on the broken road, like us astounded by the damage and unsettled by the fact that our knowledge of the world extended in only a 2-mile radius. One industrious neighbor was already out on his small excavator filling in some of the smaller rifts in the road up the mountain. As we approached home, several members of the local fire department arrived after an difficult journey on four-wheelers through the woods. They were checking to see if everyone was still alive and were clearly bewildered by a long day out on their vehicles *wandering in disbelief*.

*Our cadence of wandering and disbelief* grew stranger on the second day as the isolation became confining. A number of outlandish escape plans were hatched: one neighbor hiked to the top of the mountain where she could get a weak cell phone

signal that she used to contact the International Red Cross, requesting an airlift; another jumped on his bike to ride 15 miles to the nearest major town, promising to return with supplies but instead returning empty handed several hours later. The one person who had an electric generator for emergencies had managed to empty it of gasoline in 24 hours, an astonishing feat accomplished by leaving the TV on all day. A plan was devised to siphon gasoline from another neighbor's antique car collection in order to refuel, though the right equipment for the job was never located. Amid the panic, however, we were encouraged that several local owners of heavy machinery continued to make progress repairing the dirt roads. It was becoming clear that we would be able to leave the mountain in a day or so, although where we might be able to go beyond that remained unknown. Yet our ongoing movement helped cope with the confusion, so we continued *wandering in disbelief*.



**Figure 39.** The mountain road following Hurricane Irene [photo: author]

## X.

*The production of subjectivity* includes the active, creative participation of natural phenomena as abstract machines forging new affinities within the socius and human subject. Ecosophy, with its concern for nature's unexhaustiveness, provides a way "to think the environment as a negotiation of dynamic arrangements of human *and* nonhuman stressors, *both* of which are informed and "intelligent"" (Herzogenrath,

2009: 4). In order to affectively map catastrophic hurricanes through human lives and beyond, it is essential to allow the environment to act and to consider those actions in such a way that “Subjectivity is no longer exclusively located in a body: it is a collective moving-through” (Manning, 2009: 22) enacted between and across the three ecological registers. Through an involvement with a hurricane’s virtuality, it is possible to partake of the environment as a force constantly engaged in creation and creative destruction, deeply involved in *the production of human subjectivity*.

*The production of subjectivity* altered the contours of life throughout Vermont as countless residents lost their homes and livelihoods in Irene’s flooding. For months after the storm, there were still possessions, washed out of ruined homes, stuck in the branches of trees along the rivers. One commenter described these as “things and variations of everybody's life that went down the river” (Cohen, 2011). The storm undercut very stable elements in the ‘life’ of Vermonters: it is a life in the singular, as he described it, a collective existence that has been altered irreversibly through the inexpressible force of the storm. This subjective transformation is detailed in a book on the effects of Hurricane Irene in Vermont, published locally just months after the storm:

We know that we are changed; we don’t know how much... Familiar rivers and rills became something else entirely, torrents with incalculable power. In less than a workday, they carved both physical and metaphysical chasms into people and places, realigned hundreds of miles of our land, destroyed hundreds of homes and businesses (Daley, 2011: unpaginated).

Those affected are not individuals who simply lost something valuable in the storm, but whose common understanding of the environment’s agency has been transformed by the hurricane machine. They are changed in a way that exceeds the property lost, carried away in *the production of subjectivity*.

*Subjectivity is produced* as these storms, with their destructive capacity, their erratic paths and their often-surprising power, transverse the three ecological registers.

As a senior meteorologist I spoke with at the National Weather Service in the Florida Keys explained, “the hurricane problem is much more than a scientific issue. It’s part meteorological, part sociological, part physical.” Tracking is a well-developed science that, in the end, can do little more than follow in a hurricane’s wake. But when a major storm makes landfall, the staggering changes it causes within society, subject and physical environment are guaranteed, calling attention to the “non-human pre-personal part of subjectivity” (Guattari, 1995: 9) that will always remain unknown and unforeseeable. One Vermonter constantly wonders, “What does nature have to teach me about what happened?... the only thing I've gotten out of it so far is life is uncertain, and things happen all the time.... I have to learn how to look at change and uncertainty...make friends with uncertainty” (Cohen and Daniels, 2011). Hurricanes harbor considerable potential in their trajectories, and can form a devastating bridge across the virtual-actual boundary as an unforeseeable element in *the production of our subjectivity*.

## **XI.**

A “*residual horizon of discursive time*” (Guattari, 1995: 102) emerges in the wake of a natural disaster as recovery efforts progress, present circumstances align with past events, and subject groups cohere around the singularity. According to Guattari, “the ecosophic problematic is that of the production of human existence itself in new historical contexts” (2000: 34) so that affected groups are produced anew as a major hurricane continues to reterritorialize the narrative of history, even long after the storm has passed. At the time of writing, over two years after the storm devastated Vermont, local media continues to regularly report on Irene’s prolonged aftermath, while nearly every day we are confronted with the sight of empty lots where homes were washed away and others are still marked for destruction by FEMA. The hurricane persists, resonating throughout the region even as recovery continues. Hurricanes are machines

“in transport” (Massumi, 2002: xx), riding on their own melting as their narrative continues to unfold along a *residual horizon of discursive time*.

As a *residual horizon of discursive time*, history accounts for dissident vectors by incorporating them into its narrative. History is a quasi-creative mapping of singularities through which time doesn't exclusively move forward, it moves equally backwards and in fact all around us, as our subjectivity incorporates new events and realigns with old events so that space and time are “never neutral receptacles; they must be accomplished, engendered by productions of subjectivity” (Guattari, 1995: 103). As Guattari explains, it is at the intersection of “radical innovations and once forgotten, then reactivated, ancestral machinic lines, that the movement of history singularises itself” (1995: 41). In this way, the 1938 Hurricane and Hurricane Irene, both considerable singularities in their own right, intersect across time like two powerful weather systems combining strength as they converge over the Atlantic. Together, they form a much larger and much more formidable storm as they unite along the *residual horizon of discursive time*.

Along this *residual horizon of discursive time*, temporality realigns according to transversal movements across the three registers through forces of chaos that don't necessarily advance in foreseeable ways. Our recorded past is therefore “anticipatory” in that it involves a process of “framing histories around movement rather than stasis, and drawing connections between past dynamism and future process” (DeSilvey, 2012: 34). Time is thus an activity of constant cognitive and affective reorientation, leaving in its path a horizon along which we can now expect another hurricane. Vermont is reconstructing its towns based on a new orientation through which catastrophic storms are no longer atypical but rather periodic devastating events in New England. Town planners are prohibiting development in flood zones, reinforcing bridges and

riverbanks and enacting mitigation directives to deal with the next ‘big one’. We anticipate a changed and changeable future based on a newly signified past, aligned along a *residual horizon of discursive time*.



**Figure 40. (left)** A home marked for destruction, South Newfane, Vermont; another home that once stood in the foreground was washed away in the storm [photo: author]; **Figure 41. (right)** The normally docile river across the road that rose 15ft in the flood [photos: author]

## XII.

*“There is a threshold beyond which you can’t go in derailing history”,* Guattari tells us (quoted in Dosse, 2011; 77). History can be manipulated, intentionally as much as through the chance occurrence of transformational events, but the enduring reality of a storm that devastated Vermont in 1938, and now a second storm that devastated the state in 2011, cannot be derailed. History’s narration and documentation is, like a poem, a deliberate, creative effort to enframe chaos, fixing in place a rupture by which the world is thereafter organized. When the flood marker was painted in Wilmington following the 1938 Hurricane, the town became continuously subjected to this persisting memorial of the storm. The hurricane was captured as an indisputable event on the outer wall of the police station, a very concrete reminder that the town had once been completely underwater and had suffered considerably during this aberrant event which cannot now be erased, marking a *threshold beyond which you can’t go in derailing history*.

Yet there is a *threshold that can be relocated to avoid derailing history*, as it was with the arrival of Hurricane Irene, which similarly inundated the town in 2011,

altering the flood marker in meaning and magnifying its significance. Suddenly, the original marker called to mind a repeated event rather than a staggering anomaly, for “Repetition is never a historical fact, but rather the historical condition under which something new is effectively produced” (Deleuze, 2001: 90). As the town recovered, a second flood marker commemorating Irene was also painted on the outer wall of the police station, several inches above the original, and flowers boxes were added to the windows on either side. History was not derailed, but its narrative trajectory was modified and its material and memorial remains permanently transformed through “a movement of deterritorialisation that develops fields of the possible” (Guattari, 1995: 27). The past emerges as more than a static narrative; it is “that which can be more or less endlessly revived, dynamized, revived.... It is the inexhaustible condition not just of an affirmation of the present but also of its criticism and transformation” (Grosz, 2004: 178). The 1938 storm was multiplied and amplified so that the original storm became an event refrained, but also a threshold relocated. Throughout Vermont, and in Wilmington in particular, catastrophic hurricanes have become a regular occurrence that can be expected at least once per century, making the past more dynamic than the immobile record it is often perceived to be and providing a source of creativity in which *a threshold can be relocated to avoid derailing history.*

*There is a threshold beyond which you can't go in derailing history,* and so we are now awaiting another hurricane to extend the series. This concern was pronounced, though unrealized, with the arrival of Hurricane Sandy in 2012. Vermonters panicked as the ‘Superstorm’ moved up the east coast of the US, expecting a second catastrophe to befall the state in little over a year and making every effort to mitigate the possible impact. New Yorkers, on the other hand, having been bypassed by the Hurricane Irene, refused evacuation orders, bothered with only minimal preparation and were subsequently overwhelmed by the devastation of the storm. As

hurricanes threaten the northeast, our lived world exists “at the intersection of the imagined future and the imagined past” (DeSilvey, 2012: 35) in which storm activity of this caliber was formerly an aberration but in which it is now expected to increase as the global climate continues to change. Rebuilding has been slow in devastated towns such as Wilmington as we wait for the next storm to alter the field of the possible, but for now we are respecting the *new threshold beyond which we can’t go in derailing history*.



**Figure 42.** Flood marker, Wilmington, VT, now also featuring Hurricane Irene [Photo: Author 2103]

### XIII.

“When normalcy would be restored was still well in the future”, The Vermont Phoenix observed two days after the 1938 Hurricane (Terrific toll, 1938: 1). Telephone and power lines were knocked down throughout the state and hundreds of bridges were destroyed, compromising 2000 miles of public roads. Many communities were completely isolated until temporary emergency routes could be built to the outside world. The word ‘normalcy’ was popularized during the presidential election of 1920 when Warren G. Harding promised ‘a return to normalcy’ after the upheaval of WWI. ‘Normalcy’ was used often in accounts of the 1938 Hurricane, which befell the region during the interwar period, when WWI was still a bitter memory and a new war was already brewing in Europe. One observer described the days following the storm as

“somehow what you would imagine war days to be like - tenseness beneath light laughter and gayety” (Federal Writers’ Project, 1938: 216), with residents ill at ease at the uncertainty of not yet knowing *when normalcy would be restored*.

*Normalcy was restored less quickly* in New York where a huge stretch of Long Island’s south shore was destroyed in the storm. A 15-foot storm surge with 25-foot waves washed away a number of seaside communities and, combined with winds up to 150 mph, killed 50 people in New York alone. Eastern Long Island suffered the brunt of the landfall impact, a force so strong that it registered on seismographs as far away as Alaska, earning the storm the name ‘Long Island Express’ (Emanuel, 2005: 159). The hurricane then moved rapidly through New England, inflicting significant damage on Connecticut and Massachusetts and still retaining much of its strength as it entered Vermont. In the aftermath of this Depression-era hurricane, the entire region waited a long time for *normalcy to be restored*.

*“Some semblance of normalcy”* returned to most Vermont towns a week following the storm, according to the Brattleboro Daily Reformer (1938: 9). A recent documentary created from footage taken after the 1938 Hurricane in Wilmington depicts the slow process of this return (The Student Network, 2013). Grainy scenes feature men in bowler hats and women in calf-length skirts milling through piles of rubble on Main Street after the river overran its banks “almost without warning” (The Brattleboro Daily Reformer, 1938: 5). Houses ripped from foundations dangle precariously over the water and the soaking contents of homes and businesses are heaped in huge piles in the streets. Cows are led over wooden planks where bridges once stood and a horse struggles as it is rescued from a collapsed roadbed. The owners of a local riverside restaurant, the ‘Green Shutters’, stare in disbelief at the foundation completely washed out from under the building. In 2011 the restaurant, now called

'Dot's', suffered a similar fate with the entire back side of the building falling into the river during Hurricane Irene. Here in Wilmington, the 1938 flood marker was painted on the outer wall of the police station once *normalcy was restored*.

#### **XIV.**

*Refrains achieve consistency within the world*, changing and creating subjective milieus through "intensive repetition, as piercing existential affirmation" (Guattari, 1995: 28). It is through refrains that singularities endure, taking on many forms as they configure the territory of an event: news stories, works of art, nightmares, the simple act of driving past a desolate patch of land where a house once stood. In December 2013, Vermont Public Radio broadcast a refrain simultaneously celebrating and lamenting the departure of Federal Emergency Management Agency as it finally closed its Vermont office, opened in the wake of Irene, after over two years. While FEMA helped secure \$23 million in recovery aid for the state, it also left Vermonters outraged at the bureaucratic struggle, and frequent impossibility, of rebuilding (Cohen, 2013). This story both generates a fixed record of the hurricane's aftermath while also deploying the affects of shock, frustration and helplessness, the murky intangibles that continue to linger after the storm. Irene's territory establishes itself through this type of ongoing repetition, extending, contracting and changing form as succeeding *refrains achieve consistency*.

*Refrains achieve consistency within the world* even as they alter the world, territorializing and reinforcing the hurricane's domain of influence while simultaneously reterritorializing the margins of this domain. Like Vermont Public Radio's story on FEMA, refrains function as an "interface" between discursive actuality and non-discursive virtuality. An event achieves consistency through this repetition, attaining the quality of unrepeatability required to reach a "threshold crossing... that legitimates a relation of full existential belonging to a group-subject" (Guattari, 1996:

165), whereby the storm bypasses the point at which it can still be considered just another storm and becomes the incontrovertible event of Hurricane Irene that we all experienced. Yet the dimensions of the event change as communities are strengthened in the aftermath, families are denied money to rebuild and doctoral research is complicated through personal experience. An event must first cross a threshold of impact before it has the power to forge subjectivities, while the details of that impact play out endlessly as the storm's *refrains continue to achieve consistency within the world*.

*Refrains achieve consistency within the world*, in ways both clearly representable and exclusively felt as a natural disaster unfolds. They manifest in the feeling of being constantly confronted with storm damage as much as in an article in the local newspaper marking the anniversary of Irene, dealing in the actual and generating the virtual. These sustaining rhythms make the storm a consistent but at once evolving event around which local subjectivity aligns and continuously realigns, establishing the storm's territory through the occurrence of "existential ritornellos" (Guattari, 1996: 165). Vermont Public Radio has called this territorialized storm "The Irene Effect" (Zind, 2011), but it could equally be referred to as 'The Irene *Affect*'. Irene is at once an accrual of dialog, action and analysis, while also a felt excess beyond our capacity for communication: it is an atmosphere of signs and affects to which we all belong, which belongs to us and *though the rhythm of which our world achieves consistency*.

## **XV.**

*"Betrayal becomes something to be affirmed"* (Alliez and Goffey, 2011: 10) when a hurricane suddenly and drastically alters the boundaries of the familiar world. A storm like Irene causes a significant disturbance within the environmental register and "when an important mutation appears within a domain, it can have "fallout," it can

transversally contaminate many other domains" (Guattari, 1995: 101). Vermonters were stunned and disturbed by the surprise of Hurricane Irene, alarmed by the changes it produced, both physical and subjective. Yet what was originally a sudden contamination has become an enduring part of our selves and communities, a naturalized element of our lives. We were forcefully betrayed by the natural environment and as the unfamiliar event was experienced and processed we became a subject group that both participates in the storm's refraining as much as we are shaped by it. We were disturbed and unhinged by the storm but it has become an essential aspect of our collective being, as its *betrayal became something to be affirmed*.

*Betrayal becomes something to be affirmed* after the storm's occurrence, as dissident vectors reorient the world according to their trajectories. Reflecting on the cohesion of any assemblage, Deleuze and Guattari contend that "What holds all the components together are *transversals*, and the transversal itself is only a component that has taken upon itself the specialized vector of deterritorialization" (1987: 336). Events and experiences, and by extension communities and individuals, are defined by their threshold characteristics, their contrary and incongruous features rather than their consistencies. They continue, "In effect, what holds an assemblage together is not the play of framing forms or linear causalities but, actually or potentially, its most deterritorialized component, a cutting edge of deterritorialization" (Deleuze and Guattari, 1987: 336). The world is normalized around this cutting edge so that even after we were shocked by the arrival of Irene, unnerved by its confusion and disruption, we were unexpectedly affirmed as a community through *the storm's betrayal*.

*The storm's betrayal was definitively affirmed* on my second field visit to the Florida Keys. I had spent a good part of the summer interviewing locals about their experiences with Hurricane Wilma, hoping their words would enable me to adequately

convey the intensity of this event through writing. Soon after I returned to Vermont I experienced my own hurricane: the dramatic breakdown of infrastructure, the destruction of the familiar, the loss of property, the processing and recovery. When I returned to the Florida Keys two months after Irene, I felt a new unspoken and unspeakable understanding between the Hurricane Wilma victims and myself. It was an understanding that involved neither commiseration nor comparisons, as no one seemed particularly interested in hearing my own story. Yet there was an undeniable felt connection, an affinity stretching the 1500-mile distance between my home and my field site as we collectively acknowledged the changes wrought by environmental catastrophe, an acknowledgement through which Irene's *betrayal was definitively affirmed*.

#### **XVI.**

*A chance convergence* of three strong weather systems occurred again during the remarkably active 2012 hurricane season, a situation distinctly reminiscent of the meteorological anomaly of the 1938 Hurricane. On October 24<sup>th</sup>, 2012, still days away from a possible U.S. landfall, Tropical Storm Sandy reached hurricane strength south of Jamaica and was dubbed a 'Frankenstorm' with the worst-case scenario predicting it would make its way up the eastern seaboard to converge with a powerful early winter storm moving in from the northwest, arriving just in time for Halloween. By October 28<sup>th</sup>, Sandy had killed 65 people in the Caribbean, and was a few hundred miles off the coast of the Carolinas, having become the largest hurricane in Atlantic history with a diameter of over 900 miles. Landfall was predicted in New England and the Vermont governor had preemptively declared a state of emergency. While I had returned to the UK at this point, conversations with friends and relatives at home revealed that we were all nervous the storm could be another Irene, or worse, devastating our world again by *chance convergence*.

*This second chance convergence*, a distant singularity experienced from thousands of miles away, added yet another uncanny personal dimension to my research. By October 29<sup>th</sup>, the eye was expected to miss New England but new predictions had Sandy making landfall just south of Manhattan during a full moon high tide, causing a storm surge of up to 12 feet in the corner of land formed by New Jersey and Long Island. Little more than a year after Hurricane Irene devastated the Vermont town my family had lived in for a number years, Hurricane Sandy was heading directly for Long Beach, NY, the city on the south shore of Long Island where I grew up, located in the path of the expected storm surge. In the face of my own alarm, however, friends and family in New York seemed strangely unconcerned. Hurricane Irene, despite predictions, had caused little damage in New York beyond a temporary power outage. This time, most New Yorkers opted to remain home regardless of a mandatory evacuation order, refusing to accommodate *this chance convergence*.

*On the brink of this chance convergence*, I was alarmed but also distinctly energized by the now familiar feeling of catastrophe and the arrival of yet another hurricane to lend weight to my project. After the storm hit New York, there was little news in the first 24 hours and I assumed that the damage was minimal. Yet soon I learned that power and phone lines had been compromised and cell phone towers had been destroyed, so communication was practically impossible. It was still unclear how big the storm surge was or which areas had been affected and for several days I was consumed by the process of checking news, email and social media for any updates. Before long, there were reports from Manhattan describing widespread power outages, barely-functioning hospitals and a flooded financial district, but little news from Long Island where the condition of my 88-year-old grandmother and her home were still unknown. As I waited for more information, I was completely transfixed by the storm

and its productive coincidence, deterritorialized by the affinity of another *chance convergence*.

## **XVII.**

*Guattari's call to experiment* the world through a consideration of the incorporeal results in a project predisposed to failure as affect, its driving force, is "manifested by unlocatable transferences" (1996: 158). As Guattari tells us, "Affect sticks to subjectivity" (1996: 158); it is the pre-personal participatory medium through which subjectivities organize, the "deterritorialized matter of enunciation" (1996: 168) redirecting bodies in motion through the ethics of response. Attending to the production of subjectivity is therefore one way to locate affect, to address the unnavigable spaces emerging throughout the event of a hurricane. An ecosophic cartography considers how the three registers are transversally linked through a singularity of this magnitude by engaging with the essence of this linkage: the affective intensity. This work therefore requires the creation of a new event that prolongs the expression of the hurricane itself, not locating the original singularity but continuing it through new affective pathways in response to *Guattari's call to experiment*.

*Guattari's call to experiment* is accompanied by an imperative to work with his philosophies in terms closer to his own. A Stengers remind us, we are not to 'use' the philosophy of Guattari, but to 'do' the philosophy of Guattari. This chapter, in other words, must be complemented in some way by another creative effort, however provisional, that provides a way to think through natural disasters not as static events but as abstract machines both altering the parameters of subjectivity and continuing on as limitless agents of expression. Attempts to continue the singularity in this way must be "animated by a mutant creationism, always to be re-invented, always about to be lost" (Guattari, 1995: 116). This chapter's modestly experimental narration, though its words feel insufficient against the surreality of the event-in-action, serves to prolong, 'in

a tentative way', the expression of the storm in response to Guattari's *call to experiment*.

*Guattari's call to experiment* would be ignored if this writing was not complicated by a determined gesture towards the nondiscursive. Mapping the transversality of a hurricane can only be a post-emptive action, but one in which creative impulses, themselves transversal, can continue the map in any direction. An ecosophic cartography must encourage a proximity to the virtual that threatens to take off in a line of flight at any moment. In Guattari's words, "Enunciation is like an orchestra conductor who on occasion accepts a loss of control over the musicians: at certain moments it is articulatory pleasure of rhythm, or it is an inflated style that begins to play a solo and to impose it upon the others" (1996: 165). Here, it is movement that makes a map, more than representation, and though the event of a storm may seem temporally and spatially bounded, it possesses the itinerancy of a poem in that "The possibilities for tune from the dramatic tones of meaning struck across the rigidity of a limited meter are endless" (Frost, 2007: 131). Enunciation, therefore, cultivates a restless tension between the virtual and the actual, a chaosmic stasis that is developed through refrains but must ultimately ride on its own melting as it responds to this *call to experiment*.

#### **XVIII.**

"*In order to be able to tell a story,*" Guattari tells us, "one must start from a point that is unnameable, unrecountable, which is the very point of the rupture of sense and the point of absolute non-story" (2011b: 47). A storm narrative starts from the intangible space of a hurricane's occurrence, a point at which the three ecological registers are all at once impacted and subsequently transformed. An expression worthy of the singularity requires not only a consideration of the storm's extension across multiple registers, but also a commitment to sensory experimentation with the ongoing

affective energies that issue forth from any point of rupture. The event is evoked not simply for the purposes of relaying its details but for the purposes of working around and through the singularity *in order to be able to tell a story*.

*In order to be able to tell a story*, we must assemble “a narration whose primary function is not to engender a rational explanation but to promote complex refrains, supports of an intensive, memorial persistence and an event-centred consistency” (Guattari, 1995: 61). Storytelling is a ‘mode of intervention’ that further intensifies the storm and through which the consistency of an unspeakable event is ‘partially enunciated’. This story-poem of Hurricane Irene is an attempt to make something that is sensorially novel, though decidedly tentative, through the limited medium of academic writing. A story, therefore, needs to make sensation as much as it makes sense. Writing does not contain affect but it is a tool for generating it, for transferring singularities anew as reterritorializing refrains, involving the reader in the persisting hurricane machine, if not the singularity of the hurricane itself. As Stengers explains, “Guattari’s constructs require their users to be carried away in a machinic process of pragmatic creation” (2011: 141). They invite us to involve ourselves in creation, to take part in an unexhaustive processing of events, to engage in a poetics of Whitehead’s ragged edge that assembles a risky form of sense through which *we may be able to tell a story*.

*In order to be able to tell a story*, ecosophic cartography requires a movement of the moving, from one affinity to the next, that doesn’t end neatly but remains open at its ends, affirmative but inconclusive. It is through refrains that this movement progresses, providing “a kind of rhythmic regularity that brings a minimum of livable order to a situation in which chaos beckons” (Grosz, 2008: 53). A story emerges from the deliberate but speculative movement of this chaos as the unnameable is rhythmically transported, changing the speed of chaos and manipulating its force. Like

a poem, a story “assumes direction with the first line laid down, it runs a course of lucky events, and ends in a clarification of life - not necessarily a great clarification... but in a momentary stay against confusion” (Frost, 2007: 131). Guattari never intended for us to reach any definitive conclusions because ecosophy doesn’t ever conclude: it is successful only if it has “found being” (2011a: 35). Once that being is discovered, its movement can be fostered so that we involve ourselves in an event’s process; we ride with it on its own melting *in order to be able to tell a story*.

## **XIX.**

*As the narrative evolved* in the days and weeks following the storm, we learned that four houses had been washed away in the valley below, as well as a number of bridges. Stories emerged from all over Vermont of towns isolated for days, lives ripped apart and families who lost all of their possessions. It continued to rain heavily off and on for several weeks after Irene passed, causing us to revisit our initial alarm. Many locals described a visceral feeling experienced with each downpour: as one woman whose home was ripped in half by the flood explained, “we no longer trust the river. She took something away from us.... when it rains you get really nervous. And you watch the water closely” (Cohen and Daniels: 2011). Another who also lost her home described the panicked ‘water dreams’ that “haunted her” during the first several weeks after the storm (Brandon et al, 2012: 72). Even those of us for whom the storm was an adventure more than a tragedy experienced a palpable unease each time it rained. Water became a source of anxiety and an object of mistrust *as the narrative evolved*.

*As the narrative evolved*, Vermont Public Radio told the story of one man, a widower in his 70s, who was unfortunate enough to have his home washed away during the flood. He was featured on the national news where a former fiancé, 2000 miles away in New Mexico, saw him on TV and managed to reconnect with him again after losing touch 50 years ago. He had disappeared from her life in the 1960s and she

never understood why, until they reunited and he admitted that her parents had threatened him to leave their daughter alone. After this loss so many years ago, the storm cut across time and space to reunite him with his lost love. He says he “is still puzzling over how a disaster can become a blessing” (Keese, 2011). For me as well, the disaster was distinctly advantageous, meaning less fieldwork in Florida and less inconvenience to my family. It also cultivated an affinity within the storm narrative that I had been developing adding a personal refrain to a story that was otherwise based far from home and intensifying my project substantially *as the narrative evolved*.

*As the narrative evolved*, the residents of South Newfane organized a parade on the first anniversary of the storm to remember Hurricane Irene, celebrating community efforts to arrange aid and relief in the aftermath. The parade began at a huge pile of rubble where a modest yellow house used to stand and participants marched across sections of newly-reconstructed roads and through a historic covered bridge that miraculously survived the flood. Tractors pulling farm animals, pick-up trucks full of preschoolers and locals on foot carried signs enthusiastically declaring “Together We Survived Irene,” “We still love our river,” and “No bridges, no roads, no problem!” Infrastructure has been rebuilt, riverbanks have been reinforced, local spirits are elevated and a second parade was held in 2013. Yet there is a continuous tension underlying this sense of resilience and affirmation as we wonder when we may be painting another flood marker on the outer wall of Wilmington police station. Within this tension, subjectivities continue to reorganize in the wake of the storm, proliferating through ongoing affinities that are made and remade as the shifting cartography of Hurricane Irene rides on *the evolving narrative of its own melting*.



**Figure 43.** Rock River Revival Parade, August 2012 [photo: Luke Stafford]

She sang beyond the genius of the sea.  
The water never formed to mind or voice,  
Like a body wholly body, fluttering  
Its empty sleeves; and yet its mimic motion  
Made constant cry, caused constantly a cry,  
That was not ours although we understood,  
Inhuman, of the veritable ocean.

The sea was not a mask. No more was she.  
The song and water were not medleyed sound  
Even if what she sang was what she heard.  
Since what she sang was uttered word by word.  
It may be that in all her phrases stirred  
The grinding water and the gasping wind;  
But it was she and not the sea we heard.

- *The Idea of Order At Key West* by Wallace  
Stevens (1990)

## Chapter Eight: A cartography of mangroves

### Theorizing the ocean

Hurricanes and sea level rise occur within an extensive and dynamic air-water system that frustrates any attempt to neatly disentangle the atmospheric forces that generate weather from the movements of the ocean. As Ingold has suggested, “the sky is not a surface, real or imaginary, but a medium” (2005: 104) in which bodies encounter and affect each other, and likewise the ocean with its currents, surges and circulations provides a distinct medium “that is constituted by and constitutive of movement” (Steinberg, 2013: 165). Within the element of water there is no straightforward way to follow a line and, as with hurricanes and other mobile elements in the atmosphere, the ocean provides an alternative medium in which travel “can be understood as a processual transformation” (McCormack, 2008: 422). In describing the immersive qualities of a balloon adrift in the atmosphere, McCormack contrasts its journey to that of a boat, which “exploits the difference between the densities of water and air”, whereas the balloon, on the other hand, “has no way of moving against, or disagreeing, with this medium” (McCormack 2014, 10). The ocean might be characterized by *submersion* rather than *immersion*, but things floating on its surface and inhabiting its coasts are also characterized by a strange *intermersion* that exploits the variation *between* media, enrolled in two different relational systems which themselves exhibit different typologies of motion (Cresswell, 2010). Throughout this thesis I have pursued this middle space in which things might work both with and against each other: a space of “irresolution” that Lorimer (2008) suggests might be best addressed through creative approaches like poetry. McCormack (2009) outlines a “geopoetics of air”, elaborated by Engelmann (2015) as an “airy poetics”, which is apprehended by sensing with and within atmospheres, conceived as both physical and affective. The Florida Keys are, however, facing a *dual* threat—hurricanes and sea level

rise—one coming from the atmosphere in which storm activity occurs and the other from the ocean which is set to expand and overtake the islands. Therefore, building on these poetics, I theorize what this material poetry might look like when applied to the distinct but intimately related medium of the ocean via the metaphor of the mangrove, with its vulnerable but persistent islands like “an assemblage of relations emerging from a distributed background of technologies and practices” (McCormack, 2009: 27). Thus, by way of conclusion, I would like to boldly disentangle the ocean and the atmosphere for a moment to focus exclusively on the mobile properties of water, and more specifically on the shifting border region at which the ocean encounters the land. Following the original intentions of this thesis, which aimed to address the water-land dynamic in the Florida Keys, it is along the shoreline where sea level rise plays out as a rapidly shifting relationship between the Earth’s water and its land. Encouraged by Haraway’s very early work on metaphor, which she describes as “a property of language that gives boundaries to worlds” (2004: 10), this chapter returns to this coastline in order to proffer the mangrove as a comprehensive and distinctly geographical “image of thought” (Deleuze, 2001) through which to communicate this betweenness and to exploit the capacity of words to invoke movement, change and transition.

The ocean itself is far from the uniform body of water it is often imagined to be so that employing “the sea as a spatial focus of research, while empirically potent, may be ontologically problematic” (Bear, 2013: 36). When dealing with the ocean, access issues limit our engagements largely to its surface and its edges, while the contents and conditions of its depths and center remain mysterious and elusive. Because of these limitations, Steinberg argues that the ocean is either treated as a surface on which humans and their commodities travel or as an abstract symbol, so that “in order to fully appreciate the ocean as a uniquely fluid and dynamic space we need to develop an

epistemology that views the ocean as continually being reconstituted by a variety of elements” (2013: 157). The ocean possesses a distinct materiality by which it moves, flows and renews itself constantly; it is “a watery, undulating, deep material; a material which is affective; a material which can only be managed; a material which is in many ways a ‘force’” (Peters, 2012: 1253). It is a medium that is ceaselessly in motion so that in order to understand its potential we need to consider “water flows as *intensive* processes” (Protevi, 2009: 95), which is why “Following water is a great way to think in the Deleuzian manner” (2009: 95). Thus, the ocean can be used to develop the concept of becoming through an emphasis on its mobile, unpredictable and nomadic nature. The ocean is also materially significant for its energetic and transformational intersection with the coastline, where the “union of water and earth produces an admixture...that is one of the fundamental schemes of materialism” (Bachelard, 2006: 104). Indeed, these intertidal areas are spaces in which two physical elements intersect, combine and separate, but also in which diverse bodies affect each other in particular ways. Considering our necessarily partial encounters with the ocean, these littoral edges are of great importance as the ocean’s continual reconstitution can be most easily experienced and observed through relationships that unfold in this threshold zone.



**Figure 44.** The tangled roots of a mangal [image: Epeterson1222<sup>25</sup>]

In the tropical regions of the world, extensive mangals grow and thrive along this edge, inhabiting the constantly changing intersection between the smooth space of the ocean and the more striated medium of land. The Florida Keys, as discussed in Chapter Three, are surrounded and formed by thick mangals that both reinforce and complicate the edges of the islands and gather in the shallows further out to sea. As they entangle the shoreline, a journey through a mangal becomes a daunting prospect:

The substrate is usually a firm and soft mud into which the traveler may sink, so that walking is difficult if not impossible. Progress is chiefly hindered, however, by the looping aerial roots of *Rhizophora*, which is usually the most abundant component. The traveler has the choice of walking with care on the slippery crowns of these arching stepping-stones or working almost hand over hand around them (Tomlinson, 1994: 6).

Mangroves cultivate the shoreline through one of the most unique reproductive strategies in the plant kingdom, employing the land for the purposes of rooting while using the ocean for transport and propagation. As mentioned previously, most mangrove species are viviparous, releasing pre-germinated seeds that either root in the mud below the parent plant or float away on the tide before finding a distant but hospitable environment in which to root, perhaps joining an existing mangal or else creating a new mangal island.<sup>26</sup> Once a propagule establishes itself along the watery coastline and grows to a suitable height, it launches multiple prop roots from its trunk, described as ‘adventitious’ because they develop elsewhere than the usual tip of the plant stem and which anchor the plant more firmly into the sandy shallows, enabling it to persist amid fluctuating tides and wave action. As the new root system gains traction it traps sediments, allowing fragile, new land to gradually accrue.

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<sup>26</sup> White mangroves, as opposed to black and red species, are only semi-viviparous, so that germination begins while the propagule is still attached to the parent plant, but the fruit detaches before germination is complete.



**Figure 45.** Mangrove prop roots [photo: Jonathan Wilkins<sup>27</sup>]

The mangrove has been used here as a conceptual tool for thinking through the ways climatic futures inhabit the present through their pre-germinated potential, drifting on affective tides and surges much like propagule seeds. Such detailed use of a botanical metaphor would be lacking without a consideration of Deleuze and Guattari's influential rhizomatic model, used to supplant what they call the arborescent model of knowledge, which describes a hierarchical cause and effect relationship between a tree's roots and branches, which can only grow in one direction. The rhizome, on the other hand, emphasizes relationships rather than causes and privileges multiplicities through its unlimited proliferation, creating "a mode of thought with neither a starting point nor final extremity but an infinite number of meaningful connections" (Dosse, 2011: 362). A rhizome is structured entirely of lines rather than points or positions, so that there is "a rupture in the rhizome whenever segmentary lines explode into a line of flight, but the line of flight is part of the rhizome" (Deleuze and Guattari, 1987: 10). This model is able to incorporate any possible development, allowing for multi-directional changes and associations through "a process that is perpetually prolonging itself, breaking off and starting up again" (Deleuze and Guattari, 1987: 22). Through this conception of "germinal life" (Ansell Pearson, 1999), plants "become vehicles for the transmission and communication of intensities and

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singularities or haecceities” (Ansell Pearson, 1999: 129) with land providing the medium through which root systems progress as the rhizome’s “probe-heads” (Deleuze and Guattari, 1987) work their way freely and endlessly through the soil. As Ansell Pearson explains, “the rhizome expresses nature or germinal life as the open system *par excellence*” (1999: 209, original emphasis). Yet, while rhizomatic systems are indeed dynamic and open-ended compared to the vast majority of plant structures, this idea could be carried even further by way of the more nuanced image of the *mangrove*, which proliferates over great distances via the fluid and mobile medium of the ocean. As Deleuze and Guattari themselves explain, rather than the soil in which rhizomes proliferate, “The sea is a smooth space *par excellence*” (2004: 529, emphasis added), in that it is “occupied by intensities, wind and noise, forces, and sonorous and tactile qualities” (1987: 479). Unrestrained and unpredictable change is intensified when conceived through this liquid medium of swirling forces in which propagules move speculatively across wide swaths of water until they become stranded in a favorable location. Thrift, though describing the ‘security–entertainment complex’ overtaking us in the information age, calls for a model specific to the social sciences that “depends upon the construction of the world as a surface in continuous motion ... a world of infinite mobilization” (Thrift, 2011: 8). For a thesis that locates itself within the discipline of geography, the mangrove is a plant with intriguing metaphoric potential, not only in that it is profoundly cartographic in its continuous creation of land but also that geography is adventitious in the same way as it consents to almost unlimited arrangement and development of things for the purpose of inquiry. According to Haraway it is through “visual and verbal imagery” that we form “communities that share generative commitments to explanatory and experimental practices” (2004: xix). John Law, likewise, calls for “a range of different metaphors” (2004: 62) to think through the “hinterlands” of material relations at work in the world. Therefore, perhaps

it is possible for geography to sustain its own metaphor: a world of “movement-space”, as Thrift (2004) describes it, resembling that of the mangrove. I therefore draw on geographies of affective atmospheres, of the materiality of the ocean and of creativity and poetics more broadly to propose a mangrove poetics by which we might intervene in the opening provided by the Anthropocene through “Experimental and interventionary strategies” (Hawkins et al, 2015: 339). This poetics operates via the liminal materialism, outlined in Chapter Two, which understands materiality as a turbulent and often erratic process of association and disassociation: a materiality of *thresholds* rather than *forms*.

### **The mangal**

As propagules utilize the medium of water for the purpose of conveyance, the “very special problem of the sea” (Deleuze and Guattari, 1987: 479) facilitates a freedom of movement that both enables and complicates a propagule’s ‘line of flight’. Root systems enclosed in and expanding through soil are limited in their relative speeds and ease of travel as the resistant properties of earth deny the plant the flux and flow of “Voyaging smoothly” (Deleuze and Guattari, 1987: 532), carried along by surges, currents and turbulence. While the earth undoubtedly shifts and flows in certain ways, “the invisibility of plate tectonic movement endows terrestrial space with an aura of stability that is expressed in an idealization of place that transcends the vicissitudes of time and movement” (Steinberg, 2013: 160). Water, on the other hand, is intrinsically and discernibly unstable, it “is simultaneously encountered as a depth and as a surface, as a set of fixed locations but also as an ungraspable space that is continually being reproduced by mobile molecules” (Steinberg and Peters, 2015: 252). This leads Steinberg to recommend that we make better use of the ocean by adopting a Lagrangian perspective “wherein movement, instead of being subsequent to geography, *is* geography” (Steinberg, 2013: 160, original emphasis). The Lagrangian formulation is

a mathematical model based on nonlinear analysis that is used by oceanographers to track and describe floating objects as well as to predict coastal and ocean dynamics.

Through the resulting measurements and projections,

Movement is defined by the displacement across space of material characteristics within mobile packages, not abstract forces, and these characteristics are known only through their mobility. In other words, objects come into being as they move (or unfold) through space and time. Conversely, space ceases to be a stable background but a part of the unfolding (Steinberg, 2013: 160).

Similarly, Thrift describes how new technologies “are producing a world of ‘movement-space’” (2011: 7) that disregards the preexisting grid of the Euclidean model. Thus the ocean, like the atmosphere, emerges as a medium through which bodies can more freely encounter and impact each other, generating new densities, connectivities and modes of organizing through which space is continuously and experimentally created.

Mangroves demonstrate a distinctive spatiality by way of the propagule’s ability to be transported by the ocean, adrift in what could be described as “an umbilical chaotic zone where they lose their extrinsic references and coordinates, but from where they can re-emerge invested with new charges of complexity” (Guattari, 1995: 110-111). Peters has outlined drifting as its own typology of movement with distinctive qualities that is at once “a materiality of motion (for example, snow drift), a condition of motion (drifting) and motionful experience of being-in-the-world (drifter)” (2015: 263). In terms of propagules, drifting is a spatial phenomenon, yet one that is enabled by particular *temporal* qualities that allow the seed to exist in a state of potential while it is carried by the currents. Propagules can drift for up to a year in a latent state, even surviving desiccation, before rooting and forming connections far from their parent plant. The mangrove image, in other words, can evoke passivity, inertia and inaction, accounting for states of being during which there may exist potential with no clear becoming. This latency, to return to the problem of radical passivity that I addressed in Chapter Two, serves to avoid “the ontological priority given to the dynamic-relational

patterning of action and practice” (Harrison, 2009: 1003). Through the medium of water, things can float extensively and in unforeseeable ways before making a connection, adding an element of happenstance and fortuity to their temporality but also a distinct sense of dormancy and susceptibility, a state in which nothing apparent may be happening. This condition corresponds to Thrift’s “experimentalist orientation... which can start and restart association” (2011: 8) and “produce different kinds of familiarity which demand neither conviction nor rejection but rather the taking up of the latent potentiality in a situation” (2011: 19). A propagule’s travels mirrors Spinoza’s ethical relationality, demonstrating “an ongoing oscillation between activity and passivity—between affecting and being affected” (McCormack, 2010: 644) and through which affect, much like the tide itself, “surges in the centre of indetermination” (Deleuze, 1986: 65). Events develop, in other words, not through the active efforts of ‘probe-heads’, but rather through the mobile and potent force of pre-germinated propagules, nomadic packages of seeds, affects or data, alive with potential even in an inactive state and carried along on often-unforeseen currents.

Through this process of drift and latency, mangroves exhibit an extensive phylogeography, a distributive dynamic through which relationships result from genetic affinity rather than direct root line. Mangroves, in other words, are not limited by the necessity of physical connection. In this way, they rewrite the idea of cartography originally associated with the rhizome, which Deleuze and Guattari describe as a map that is “open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification” (1987: 13), although the ways in which rhizomes can be considered “detachable” or “reversible” are not made entirely clear. Mangroves, on the other hand, through their reliance on genetic connection as well as their propagule’s ability to survive desiccation and change density in order to root or even *unroot* if a particular environment proves inhospitable, can move, transform or emerge

at a much greater, and much more variable, geographical distance, exhibiting considerable *speculative* qualities. While it may be impossible to tell where a rhizome begins or ends, it remains a bounded and visibly connected organism, always central to itself with its relationships evident by way of existing root lines that are included as part of the parent plant. The propagule can appear in a novel location without any outward evidence of origin, representing not simply a line of flight but a complete decampment so that mangrove seedlings are truly “manifested by unlocatable tranferences, unlocatable with regard to their origin as well as with regard to their destination” (Guattari, 1996: 158). Mangroves, in other words, help to outline not simply a germinal life, but *pre-germinal* life that cannot be mapped and connected by way of lines and through which affinities are genetic, resulting exclusively from relationality rather than physical link. This results in “a kind of nomadism which no longer privileges fixed territory as necessary to produce effects but which does not therefore think that the attachments of territory are somehow unimportant” (Thrift, 2011: 18). Likewise, a substantial mangrove island can form from a single seed of unknown origins rooting along a fluctuating shoreline, neither exclusively on land or in the ocean, so that new territory is *created* amid and because of ceaseless movement.



**Figure 46.** A propagule [image: Ulf Mehlig<sup>28</sup>]

If the rhizomic map is made entirely of lines rather than points or positions, then the mangrove’s viviparous map is made entirely of affinities, brought into being as propagules drift to new locations and mangals form and grow in size. They accrue in the coastal shallows the way affects accrue through the progression of an event: the surging of attention that leads Keys residents to anticipate sea level rise or fear hurricanes; the growing realization that a town will never be the same after a hurricane’s arrival; the mounting pressure on a local government to enact climate change mitigation policy. Affects accrue like mangrove islands, a phenomenon that Stewart aptly describes as a ‘bloom space’ in which “Pre-personal intensities lodge in bodies. Events, relations, and impacts accumulate as the capacities to affect and to be affected” (Stewart, 2010: 339). Events manifest through a “gangly accrual of slow or sudden accretions” (Stewart, 2010: 339) resulting in a “dense entanglement of affect, attention, the senses, and matter” (2010: 340). Connections form not always as direct lines but often grow slowly as milieus, arising from multiple successful rootings as well as the continued opportunity given to initially unsuccessful ones. It is this process of

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accrual through which archipelagos form and emerge, whether as a string of neighboring islands or a string of conceptually related events or ideas. Archipelagraphy, to reiterate, has been described by Stratford et al as “a form of counter-mapping” (2011: 114) used “to break out of stultifying and hackneyed binaries; privileging instead the power of cross-currents and connections” (2011: 125). For Deleuze and Guattari, a rhizome always begins in the middle between these binaries, in a profound and permanent state of “interbeing” (1987: 27). Yet rhizomes proliferate in soil that lacks the cross-currents necessary for events to take form in a middle space as they remain attached forever to the progenitor from which each line of flight was born. Mangroves, as an image of thought, generate archipelagos that are “sites of abstract and material relations of movement and rest, dependent on changing conditions of articulation or connection” (Stratford et al, 2011: 122). They provide an image that is viviparous rather than rhizomatic, allowing lines of flight not only a fluid and more extensive freedom of movement and development, but also a more dynamic temporality that can clearly demonstrate “nonlocal linkages and affective attunements” (Massumi, 2011: 118).

No doubt the speculative realist philosophers would question my treatment of the ocean as a ‘medium’ in which things drift and accrue. Morton has taken aim at fluid ontologies, in particular, because liquids are composed of molecules which should have an equal ontological status to all other objects. He is concerned that a perspective such as this creates a hierarchy in which “some things are more real than others: flowing liquids become templates for everything else” (Morton, 2012: 207). Objects compose each other rather than exist within a greater substance, yet, I would ask, what is a medium except a larger object that both serves to compose and is composed by the objects it harbors? In writing, as I’ve explained earlier, things must be narrated in *some* way, which can only be done by evoking words and images, something Morton does constantly in his own work. In fact, the media writer Nathan

Altice has created a weblink that lists all of Morton's metaphoric conceptualization from *Hyperobjects*, in which he compares climate change to the Titanic, a character from *Twin Peaks*, a Velvet Underground song and the Millennium Falcon, among many other things.<sup>29</sup> Therefore, with Peters I would emphasize that the ocean is at once a larger-object-as-medium and a metaphor that can be used to describe the "motionful experience of being-in-the-world" (2015: 263), a motion that could be interpreted as the universal and continuous interaction of objects that comprise Thrift's movement-space or substantiate Morton's own claim that objects "emit spacetime" (Morton, 2013: 90). The ocean, like the atmosphere, might then be considered an object exhibiting and most importantly *enabling* certain types of movement in the context of a system, which, following Bennett, is simply a different perspective on what might otherwise be an object. A mangrove model, therefore, can help us understand how to "toggle between both kinds or magnitudes of "unit" (2012: 227), as Bennett insists we must. Objects— islands, propagules, plankton, storms—and their relations—via the ocean, atmosphere, ecosystems—are both necessary points of conceptualization, an idea that might be expressed through a mangrove poetics.

### **A temporal nursery**

As outlined in the introduction to this thesis, my intention has been to explore the way time manifests in the context climate change scenarios. If the Florida Keys are considered a 'canary-in-a-coal-mine', set to serve as a warning about climate change as they become uninhabitable, I am concerned with the multiple temporalities emerging in the mine rather than the life of the canary itself or its greater socio-political implications. I have explored the way climate change futures germinate in the present, how the interruptions caused by my children might help us foreground the idea of change, how the past and future exist in atmospheric relation to the present and how

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<sup>29</sup> <http://metopal.com/projects/hyperobjects.html> [accessed June 7, 2016].

rhythm and refrain can be used in experimental ways to create the world rather than simply account for it. This work seeks to contribute to the way temporality has been theorized through non-representational theories, in particular, by temporalizing not just events, but the affective singularities they create which exceed the devices of human thought. Most importantly, non-representational theories have explored how temporalities might be storied rather than simply seen to unfold uniformly, and a number of geographers in recent years have looked at the way narrative practices might draw out, re-enliven or create time. Of particular influence has been McCormack's (2008, 2010, 2014) work on the 1897 Andrée Balloon Expedition to the North Pole, which traces a range of artefacts, including news articles, photos and memorials, through an atmosphere both physical and affective in order to understand how the world is sensed through an array of materials. My own approach has been similar as I pursue the phenomenon of climate change through storms experienced, archival texts, personal memories and evidence of extreme weather on the landscape, considering the way temporalities emerge through "a distributed field of circulating affective materials" (McCormack 2010, 642; see also Edensor, 2005; Wylie 2007; Yusoff, 2005). Also important have been a number of creative efforts to re-temporalize material remains and cultural histories through more-than-human encounters, work that acknowledges the many ways temporality is generated through the relations and interactions of multiple things, including the writer (for example Lorimer, 2006, 2014). The work of DeSilvey, in particular, explores how the processes of decomposition and decay themselves might contribute to concepts of time through an "interpretive ethic" (2006) that allows nonhuman voices to participate in the narration of temporalities. Likewise, Hill's (2015) non-representational approach to flooding in Devonshire—an event resonating with my own experience of flooding during Hurricane Irene—assembles material remains, archival sources, the present-day landscape and her own memories

to temporalize the event through the refraining sound of water, “to link together a series of space–times that are forged and disrupted through the force of affect” (Hill, 2015: 838). Overall, this work might be understood to portray temporality as *spectral* so that “the experience of space and place is always haunted by a noncoincident spatio-temporality in which past and future participate simultaneously and in unpredictable ways” (McCormack 2010, 642). My own contribution expands upon this work through what might be described as a multiplex approach to time in relation to climate change, enacted through a number of interventions in order to highlight the ways temporalities are manifold, rhythmic, contingent, and, foremost, narrated into being.

Furthermore, this thesis, in concluding, seeks to contribute to efforts to amend what Dalby (2007) calls the “terrestrocentrism” of geography. Geographies of the air and atmospheres have been well-developed from a non-representational perspective, particularly through the work of McCormack and others (for example Engelmann, 2015a, 2015b; Adey, 2006, 2008, 2015; Anderson, 2009; Adey and Anderson, 2011), who have shown the ways this vast, dispersed and recalcitrant medium lends itself to theorizations of materiality. Despite this rich dialog on atmospheres, there has been little in the way of conceptualizing the ocean, both from a nonrepresentational perspective and within geography more broadly. As noted by Steinberg and Peters (2015), despite work in historical and economic geographies (for example Spence, 2014; Merchant, 2014; Martin, 2013), there has been a lack of attention to the *materiality* of the sea, which they seek to address through what they describe as a “wet ontology” that not only endorses “a world of flows, connections, liquidities, and becomings” but also to propose “a means by which the sea’s material and phenomenological distinctiveness can facilitate the reimagining and reenlivening of a world ever on the move” (2015: 248). Furthermore, although the ocean has been included in theorizations of more-than-human assemblages (for example Lehman,

2014; J. Anderson, 2014; Bear 2013; Bear and Bull 2011) there is little work concerning the ocean that might be considered nonrepresentational, aside from Jones' work, which employs Lefebvre's rhythmanalysis to theorize tidal timescapes as complex flows that "create multiple speeds, durations, and rhythms within relational processes" (2011: 2300; see also Jones, 2010). My own efforts, in this concluding chapter in particular, aim to further theorize this oceanic materiality, and therefore *temporality*, as it occurs through the interaction of materials, through the mangrove metaphor. According to Steinberg and Peters, the ocean lends itself to theorizations of temporality because of its "the real-time, encountered mobility" (2015: 258), encountered through its rhythms, its depth, its volume and its material interaction with the atmosphere and the land, all properties that are employed to great effect by the mangrove.

Even beyond their unique capacity for drift, latency, and accrual, mangroves are also intensely *generative* as they harbor thriving ecosystems in their tangled structure of prop roots. Countless animals, including young fish, sea horses and crustaceans start their lives sheltering in the underside of a mangal where they find protection from predators, toxins and the turbulence of the ocean, leaving for the reef as they outgrow their nursery. This dense and complex web of life extends to human populations in the Keys that rely on the reef as an economic resource providing abundant fisheries and attracting millions of tourists per year. Thus, mangroves are compelling not only as a image of dynamic movement and temporality, but also in that they play a fundamental role in the nurturing and proliferation of life both in the ocean and on land, a function that dovetails with the maternal agenda I set out in Chapter Two which seeks to locate generativity in the constant interruption of motherhood. Therefore, it's not only what mangroves generate that matters but also what they are generative *of*: their movement and distribution is theoretically significant but so is the

role of harboring and caretaking that they assume. For mothers and mangroves, the very unremarkable but utterly necessary job of protecting against inundation, contamination and the large, sharp teeth of bigger animals requires what Winnicott famously refers to as 'ordinary devotion' to guard the young against "the traumatic experience of not being held well enough" (2009: 51). Constant, enduring and providing a world in which to live, we are bastions of the mundane, the empirical and the ordinary in an otherwise chaotic ocean. But inherent in this idea of ordinary devotion is also the *ordinariness* of time: in its most literal sense, 'ordinary', denotes an *order* or a *series*, a progression marked through temporal indicators. This is not a sequentially ordered and transcendent time inhabited by distinct moments, but rather the way order, and therefore temporality, emerges continuously through the regular encounters of things as a perceptible change in "the aesthetic-causal field emanated by a host of objects" (Morton, 2013: 93). Likewise, Stewart's (2007) ordinary affects, as discussed in Chapter Three, discern the subtle or sudden changes that take place in everyday situations, the way temporalities shift, transform and coalesce. According to Stewart "The poesis of the ordinary draws attention and becomes habitual because things don't just *add up*. *Something* throws itself together and then floats past or *sticks* for some reason. Some such things have *meaning* per se; most have force in some other form" (Stewart, 2007: 74, original emphasis). Ordinary devotion sustains interruption, ordinary affects recognize change in the everyday; both cultivate a proximity to the empirical present so that when something in this immediacy doesn't add up, we perceive that an event, has occurred.



**Figure 47.** Mangrove, Snipes Point, Key West [image: Florida Memory<sup>30</sup>]

In fact, the event of climate change itself is a generalized effect of things not adding up, not occurring as we expect them to or overwhelming our background sense of order. Temperatures are reaching record highs and lows, storm tracks are off-kilter, and indeed, “one vivid effect of global warming has been phonological asynchrony: the way plant and animal life events have gone out of synch” (Morton, 2013: 67). This echoes the observations of Naomi Klein in her most recent book, *This Changes Everything*, a title that references at once the way the climate crisis is changing life as we know it and the fact that becoming a mother during the writing of the book profoundly altered her perspective of that crisis. As she explains, through her research she “began to notice that a great many species besides ours are bashing up against their own infertility walls, finding it harder and harder to successfully reproduce and harder still to protect their young from the harsh new stresses of a changing climate” (Klein, 2014: Chapter 13). Among copious examples, she cites dead baby dolphins washing up along the Gulf Coast after the Deepwater Horizon oil spill, birth dens of polar bears collapsing because of melting permafrost, huge spikes in newborn congenital heart defects among human populations living near fracking sites, and male birth rates dropping precipitously in First Nation communities near petrochemical plants. Fertility

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is one of the first things to be compromised when natural populations are put under extreme physical stress, and despite the fact that we imagine extinction to be more sudden and cataclysmic, caused by asteroids or rapid over-hunting, “in the age of fossil fuels, we can render the earth less alive by far more stealthy means: by interfering with the capacity of adults to reproduce in the first place, and by making the first days of life simply too difficult to survive. No corpses, just an absence—more handfuls of nothing” (Klein, 2014: Chapter 13). These handfuls of nothing are experienced as a disruption in the ordinary, an idea that may offer some crucial purchase in addressing what Morton in his own metaphoric efforts has questionably, but in resonance with my maternal agenda, refers to as the “toxic womb” (2013: 183) of climate change<sup>31</sup>, signifying the constant, almost maternal, “intimacy” (2013: 183) that we share with this insidious and alarming phenomenon. We are already so deeply embroiled in the event of climate change, so materially contained by its effects and their temporalities that we are beginning to realize that its catastrophic futures have been germinating all along. This perspective, moreover, encapsulates the unconventional choice to employ my experience as a mother for methodological purposes: this was not simply a way to justify the slowness with which I completed this project or my erratic fieldworking efforts but a deliberate practice of attending to the ordinary and of cultivating a sensitivity to temporalities as they emerge in countless forms and through countless assemblages. As we look toward the nebulous future of our planet, we will be continuously surprised by the myriad ways things are timing each other differently in relation to climate and the destructive practices by which we are making it change, temporalities that may be less obvious but no less insidious than a destructive hurricane or the predictable incursion of the ocean.

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<sup>31</sup> Elsewhere he describes our attunement to objects in the context of an “aesthetic uterus” (Morton, 2013: 30), and while these references to female anatomy are not quite offensive they remain diminishing, and arguably *objectifying*, in their use of women’s bodies to represent the natural world.

Morton also, and less provocatively, refers to climate change as “a threatening circus clown” (2013: 147) leering at us in close proximity, and likewise, the question looming in the background of my own life in the context of climate change, and echoing Klein, is when does this threat take on the immediacy required for a more forceful response? In other words, when will it adequately interrupt my entitled American ordinary? Human populations are already being affected—with low-lying islands succumbing to sea level rise, melting permafrost forcing the migration of indigenous communities, and the Syrian conflict increasingly understood to be caused by a decade of unprecedented drought. Clearly, climate change is leading to increased transience and vulnerability and inherent in this is the fact that the ability for many human populations to regenerate is being compromised. Safeguarding the ability to reproduce is one of the most ordinary but fundamental needs and as Klein asserts, “we do a very poor job of protecting, valuing, or even noticing fertility” (2014: Chapter 13). Klein calls for increased focus on the importance of reproduction but contests the use of the term ‘resilient’ to describe the fortitude through which life successfully withstands systemic stresses, proposing to replace it with the more empowering term ‘regenerative’. As she explains, “resilience—though certainly one of nature’s greatest gifts—is a passive process, implying the ability to absorb blows and get back up. Regeneration, on the other hand, is active: we become full participants in the process of maximizing life’s creativity” (Klein, 2014: Chapter 13). IUCN and the Nature Conservancy published a report in 2006 entitled ‘Managing Mangroves for Resilience to Climate Change’, emphasizing the need to restore mangrove cover along the world’s coastlines because of the plant’s ability to tolerate storm surges and sea level rise. Yet, following Klein, the value of mangroves lies not only in their resilience but also in their intensive capacity for adaptation and regeneration. Because of the synergistic relationship between mangroves, reefs and fisheries, entire ecosystems would collapse

without their constant and protective presence. A recent study, in fact, has shown that mangroves have started to provide a novel refuge for certain types of coral that are now growing under prop roots where they are safe from bleaching and increasing acidity affecting coral living out in the open ocean (Yates et al, 2014). In other words, the mangrove, in its plant-like ordinary devotion, appears to be reviving the ailing reef itself. This is the value of regeneration: rather than attempting to restore prior conditions in the face of climatic interruptions it is an idea that allows things to creatively reorganize, to add up differently, in response. This does not always occur as sweeping or sudden changes, but as movements or displacements in the ordinary, whether that means a gradual shift to renewable resources or a reef relocating to the safety of prop roots. Regenerative efforts therefore require a greater attention to interruptions and the creativity they can foster in the immediacy of transition.

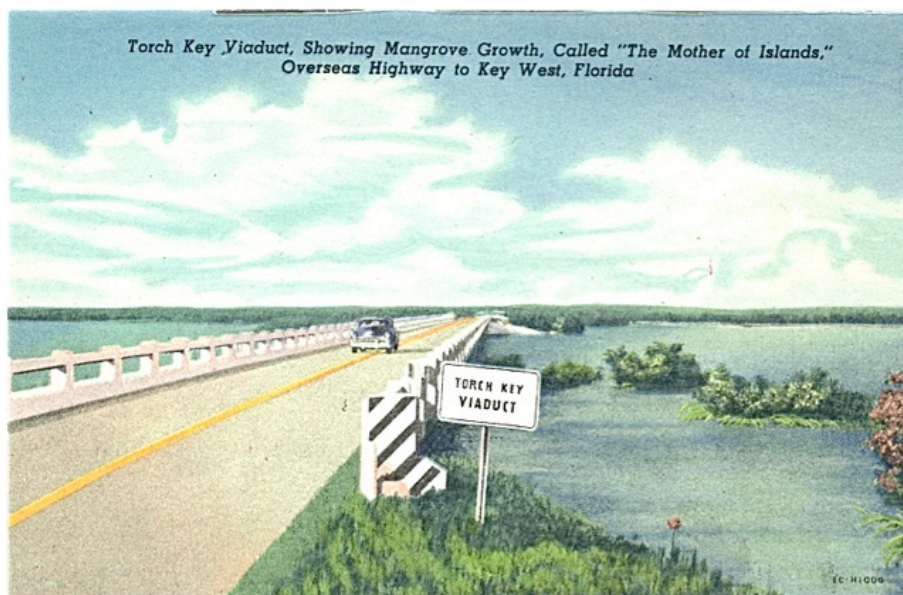


Figure 48. Mangroves: 'The Mother of Islands', from a 1940 postcard of the Overseas Highway [Curt Teich and Co., Inc.]

### A mangrove poetics

Steven Shaviro's argument with speculative realism is that despite its claims of ontology, it is actually too *epistemological* due to its emphasis on what humans are not able to *know*, as in Harman's (2005) concept of 'withdrawal' which establishes objects

as inaccessible to the human mind. Indeed, as Shaviro writes, “The status of thought remains a vexing problem for speculative realism” (2014: 108), which has been “characterized by the self-contradictory intensity of a desire for thought that can think beyond itself” (The Petropunk Collective, 2013: x). Stengers seems to indirectly critique this anti-correlationism as well in her work on Whitehead, when she writes that “every question is a human formulation, and none, as such, transcends the human adventure” (2011: 10). In the attempt to ontologically separate an object’s essence from our knowledge of it, Shaviro notes that the active process of ‘correlation’ is always undertaken by the human mind but, if thought itself is an object, it makes little sense that other objects are not able to perform a correlation to human thoughts. In other words, “thought always refers to being, but being in itself remains indifferent to thought” (Shaviro, 2014: 112), which may inadvertently grant *more* power to human thought rather than reducing its status. Speculative realism, he asserts, therefore fails to speculate on how thought might exist on its own without actively correlating to an object, and also neglects to theorize the multifarious forms that thought might take as well the innumerable beings that might do this broadly-construed thinking. Stengers, again following Whitehead, describes this type of theorizing as a bracketing of the mind by which the “relation does not include the person for whom it constitutes an explanation” (2011: 34). Perhaps, then, it is impossible for thought to think beyond itself, in which case we might find other means by which to self-consciously think the nonhuman. Bennett concurs that we may not be

capable of transcending the provincial, pro-human-conatus perspective from which we apprehend the world. If we are not, then a good tack might be to stretch and strain those modes to make room for the outlooks, rhythms, and trajectories of a greater number of actants, to, that is, get a better sense of the “operating system” upon which we humans rely (2012: 229).

I follow Bennett in asserting that poetry is one way this stretching might occur, a perspective that is gaining traction within geography as well through “a growing

willingness to experiment with the character and form of writing, and a preparedness to consider style as a pressing issue rather than a supplementary concern” (H. Lorimer, 2008: 82). Calls for a renewed interest in poetry are increasing (see Madge, 2014), as are examples of poems-as-geography (for example de Leeuw, 2012; Cresswell, 2014, 2015), a move that speaks to growing creative efforts within geography more broadly. These efforts are accompanied, as discussed earlier, by a growing impulse towards creative writing (in particular Lorimer 2014) and creative narration (for example Wylie, 2002, 2005; DeSilvey 2007, 2012; McCormack, 2010, 2014). Most relevant to my own work, McCormack, following Serres, pursues what he calls ‘circumstantial writing’, which “responds to circumstances as the call and refrain of the worlds that gather around and as things” (2014: 6), a gathering that calls to mind the mangrove metaphor I am pursuing here.

I had originally intended to call this idea a mangrove *ontology*, but claims of ontology seem to produce so much of the intellectual grasping that Stengers (2011) warns against in her contribution to *The Speculative Turn*. The idea of an ontology, a decisive and absolute claim about *how things are*, in other words, might not stretch to take in the immensity and the sheer multiplicity of things. Whitehead’s assertion that creativity is the highest value seeks address this dilemma through what he has termed the ontological *principle*: not a despotic ontology that seeks to take in all things but a theory of formation acknowledging simply that “All real togetherness is togetherness in the formal constitution of an actuality” (1978: 32). Whitehead’s creativity is non-transcendent; it is “bereft of qualifications” (Stengers 2011, 256) and has “no discriminating character” (Stengers 2011, 255). Things create worlds in their being together or being apart, and the simple fact of this continuous creation is all the ontology there is. In other words, as Stengers explains, “No explanation can lay claim to a higher instance of justification than what makes a difference for it, what matters for

it" (2011: 263). Instead of an assertion of 'This is the way things are', one might instead claim that 'This is a world that has been created'. An assemblage, an event or an object, the result is a creative effort "that produces effects, produces difference, when coupled with other bodies" (Hawkins, 2013: 10), something that results in a "distributed sense of poesis" (Hawkins 2013, 244) between the creator(s), the things created as well as the various other things that come into contact with the creation.

If, following Bachelard (2006) we understand *matter* to be a matter of imagination, all materiality is therefore, from a human perspective, a narrative effort. I thus propose a *mangrove poesis*: a self-conscious poetry of drift, speculation, turbulence, accrual, affinity and other properties enabled by the metaphoric materiality of the ocean. In this form, we might narrate the idea of unique things coming into being and coming together within mobile systems wherein movement *is* geography (Steinberg, 2013). This is not an ontology of discrete and inaccessible things, for, as Massumi says, "Rather than arriving at end-objects, or fulfilling objective ends, we are carried by wavelike tendencies, in a rollover of experiences perpetually substituting for each other" (2011: 32). Things are carried on waves of their own movement, in other words, like propagules. As Massumi insists, "To perceive the world in an object frame is to neglect the wider range of its germinal reality" (2011: 6), and therefore, while I remain wary of claims of ontology, I have come to understand claims of materialism as creative efforts, efforts that are self-aware even if they don't manage to think beyond themselves. To quote Bennett on the 'hubris' of correlating thought to things:

I, too, share the desire to cultivate theoretical modesty. But object-oriented philosophy has no monopoly on the means to this end. Contemporary materialisms (inspired by Deleuze, Thoreau, Spinoza, Latour, neuroscience, or other sources) that affirm a vitality or creative power of bodies and forces at all ranges or scales also cut against the hubris of human exceptionalism (2012, 230).

Despite any claims of ontology, in other words, even inaccessible objects must be *narrated* into aloof withdrawal. Unlike the speculative realist philosophers, I am less interested in *knowing* how things *are* than I am in *creating* things *that are*. McCormack emphasizes the necessity of “narrative spacetimes” (2014: 10), which are generated as a balloon floats through the atmosphere, encountering and affecting other things. Following this, I would suggest that *all* spacetimes are narrative, an idea that captures the essence of nonrepresentational theories in that all things must be understood as representative of the indescribable actuality of the real-time world on the move. This is not to say that representations are false or useless, but rather that they are at all times exceeded by the worlds they seek to represent. Their most important contribution, in my opinion, is that nonrepresentational theories provide a context and a vocabulary for foregrounding change, a problem I outline in my Chapter Three, without making any claims of ontology. Essentially, things can’t be represented because they are always changing, not because they withdraw from the world. Any model of spacetime, therefore, inherently fails to accurately model spacetime and must thus be acknowledged as a model. In deliberately deploying representations through the burgeoning creative efforts of geography and beyond, then, we might consciously participate in *process*, which is all that we are capable of doing and, according to Whitehead, is all that there is.

For Whitehead, objectivity is nothing but remnant activity that is left over from events and provides the raw material for continued creation. Following this, Shaviro observes that even though objects might be epistemologically withdrawn from our understanding of them, this doesn’t mean that they are “separated from one another ontologically and aesthetically” (2014: 137). His ‘speculative aesthetics’ describes an aesthetic contact that “happens in the first instance outside knowledge, on a level beneath the threshold of conscious perception or beyond its capacities to recognize or

relate" (Shaviro, 2014: 148). Aesthetics, in other words, works within the pregerminal register of affect. Non-representational theories seek to call attention to this register exactly because it can't be represented and therefore calls representation itself into question. For a thing to matter, then, it must enter into aesthetic or affective encounter with other things along what Spinoza conceptualizes as dual axes, the first of which is kinetic, referring to the relative speed of a thing, and the second of which refers to the capacity a thing has to affect or be affected by other things (see, McCormack 2009). This idea resonates with Bennett's developing work on material sympathies in the poetry of Walt Whitman, which describes an "impersonal ontological infrastructure, an undersigned system of affinities (which persist alongside antipathies) between and within bodies" (2014: 239-240). Poetry, then, might be understood to access this system of affinities in which things take and lose form, which leads me to the reiteration of two important points: the first concerns the power of poetry to allude, which I describe in Chapter Two through the aesthetic theory of Susanne Langer as well as Massumi's idea of a 'semblance', which describes a felt relation between things that is as real as the things themselves. In other words, a poem can create its own *fact* through its connection of disparate things so that "When it is most affective, it can seem formed or fabricated not so much of words but of the very things or phenomena it describes" (H. Lorimer, 2008: 81). The second point to emphasize, also discussed in Chapter Two, is a poem's ability to *create* temporality. Poetry might be understood to enact a temporal realignment in which things time each other differently through the novelty of their inclusion, or, as Langer notes, "the keynote of the poetic form is intricacy, not simplicity" (1953: 231). Morton likewise cites the ways we "experience time dilating and contracting when we read a story or a poem" (2012: 214). It follows, then, that we might make good use of poetry in speculating about the confounding object of climate change, which is, above all, an *aesthetic* problem as looming danger

and its weird temporality confront us on an affective register as I've demonstrated through my own narrations of storm events and encounters with sea level rise in the Florida Keys. In this spirit, we might look to DeSilvey's account of the slow ruination of Mullion Cove in Cornwall at the hands of the changing coastline, for her narrative is beautifully "offered into Mullion's interval of uncertainty" (2011: 6), the space between its active past and its open future. Similarly, Lorimer suggests that "it is sometimes through a geographer's intervention" that we might learn "to cope with irresolution" (2008: 82). This indeterminate quality of climate change is what I've attempted to both present and address in this thesis, and it is the reason why geography, and in particular its openness to creative practices, may be ideally-suited to addressing the Anthropocenic moment. As for the mangrove, we might see its interaction with the coastline, the shifting tidal zone where mangals thrive, as a metaphor for both the liminality of climate change itself as well as the way new objects, new things, new assemblages might root and grow in the space that it provides.

### **Liminal materialism**

Mangroves provide an image for theorizing affect as it drifts, surges and collects, forming islands of archipelagic abstraction. By way of the conceptual medium of water, "affect *accumulates*... traversing the ebbs and swells of intensities that pass between "bodies"" (Seigworth and Gregg, 2010: 2); affect is *liminal* in that it "is born in *in-between-ness* and resides as accumulative *beside-ness*" (Seigworth and Gregg, 2010: 2, original emphasis). Lines of flight aren't simply connective but rather run between things, providing a threshold along which change unfolds. As Deleuze and Guattari explain,

A line of becoming is not defined by points that it connects or by points that compose it; on the contrary, it passes *between* points, it comes up through the middle... It constitutes a zone of proximity and indiscernability, a no-man's land, a nonlocalizable relation (1987: 293).

The line of flight is less a line and more a *bordering*, “an infinite play of interface” (Guattari, 1995: 30) like the shoreline itself, unfolding within a threshold state between more stable elements. An affect or an island grows and forms until it reaches a threshold of significance, or else its germinating seed changes density and floats to a more hospitable location so that affect, like a propagule and the mangal it engenders, “is characterized by the existence of threshold effects and reversals in polarity” (Guattari, 1996: 158). The mangrove image simultaneously breaks from and cultivates the liminal zone between ocean and land as “affect emerges out of muddy, unmediated relatedness... it makes easy compartmentalisms give way to thresholds and tensions, blends and blurs” (Seigworth and Gregg, 2010: 4). Likewise, conceptual shorelines are created as time emerges through convergences and events of all kinds, so that “Things are a kind of liminal space made of other things. ... which is just what a thing is: a meeting place of other beings (“thing” is Old English for “meeting place”)” (Morton, 2014: 279). The present is this ambiguous tidal zone of things, their ordinary coexistence in which liminality is not a transcendent principle but rather the simple idea of intimacy, affinity, and affective immediacy that make it impossible to neatly disentangle individual things but that also creates these things themselves as assemblages persist. Propagules settle into this immanent transitional region but also drift away from it in search of new middles to cultivate, creating intensive meetings-of-things where they root, accrue and harbor life.

According to Deleuze and Guattari, a rhizome “is always in the middle, between things, interbeing, *intermezzo*.... The tree imposes the verb “to be,” but the fabric of the rhizome is the conjunction, “and...and...and...” (1987: 27). However, as Doel argues in his work on liminal materialism, this version of becoming, which he calls telephony, must be replaced by what he calls picnolepsy, an epileptic state of





**Figure 49.** Mangrove islands at the southern tip of mainland Florida [image: Bill Wilen, U.S. Fish and Wildlife Service<sup>33</sup>]

This thesis has concerned itself with the resonating climatic events of sea level rise and catastrophic hurricanes as they emerge in the present, building on the idea that, much like mangroves create land, “events create time and space” (Manning 2009, 7) as they materialize as affective and ongoing singularities. It is through the experience of these transformational events that we come to know and seek to understand the climate and the manifold ways it may be changing. Events don’t simply occur, they gain traction within a liminal zone of indiscernability, emerging from the affective in-between-ness of continuous becoming. As Turner explains, “Liminality is the realm of primitive hypothesis, where there is a certain freedom to juggle with the factors of existence... there is a promiscuous intermingling and juxtaposing of the categories of event, experience and knowledge” (1967: 106). Climate change, therefore, remains a transitional hypothesis, growing into a real and tangible phenomenon only as it crosses a transformational threshold. The empirical chapters of this thesis were assembled like mangal islands, an archipelago of thoughts and events concerned with the climate as it crosses this threshold. Each aims to theorize the liminality of climatic experience and explore the temporalities that emerge therein through a narrative effort of poesis: Chapter Two used blurry photos of my children to propose an event-centered

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methodology that seeks to foreground transition and consider the ways time materializes through the rhythms and resonance of different things, contexts and phenomena; Chapter Three considered how experiences, as much as representations, are not only abstractions in space but also refrains in time through which futures take root in our attention to particular things, situations, and events; Chapter Four tracked the event of a hurricane as it unfolds along an infinite line of proliferating change through the atmosphere conceived as a single field comprising internal and transpersonal affects as much as external physical effects; Chapter Five concerned itself with how knowledge of climate change emerges through affective chains of signification surrounding the enduring present and how political work involves the gradual re-signification of this present; Chapter Six explored a hurricane as an event that is both inexpressible and limitless through an experiment with refrains that attempts to prolong, rather than capture, the expression of the storm. Guattari calls for “a different metabolism of past-future where eternity will coexist with the present moment” (1995: 90), a coexistence that may be possible when the present is conceived as a radical liminality in which shifting islands of coherence form amidst the turbulence and uncertainty of climatic transition. These chapters highlight the process through which localized changes emerge and resonate ‘otherwise *elsewhere*’, following a picnoleptic model, through which climate change becomes discernable as events settle into the threshold region between past and future.

However, mangroves don’t just create islands in the intertidal zone, they are also *generative* of the abundant life that thrives within their prop roots. And our own collective subjectivities may likewise be growing and developing within the tangled roots of the event of climate change as we generate new processes and rhythms of interaction with the things around us in the context of a more optimistic Cosmocene (J. Lorimer, 2015). As Bennett contends, “One of the stakes for me of the turn to things in

contemporary theory is how it might help us live more sustainably, with less violence toward a variety of bodies” (Bennett, 2012: 232). Similarly, Morton’s aforementioned climatic womb is used to illustrate the uncanny intimacy we experience as if we exist *inside* of the ‘hyperobject’ of climate change, which provides a “demonic” (2013: 29) background that is increasingly re-ordering human temporalities. We are not simply confronted by climate change but are *embodied* by its dire immediacy. By way of response, he suggests, “What we need is an ethics of the other, an ethics based on the proximity of the stranger” (Morton, 2013: 124), a position that resonates with Baraitser’s “maternal encounters with inassimilable otherness” (2008: Chapter One) which considers “the way otherness is always at work, structuring, infecting and prompting human subjectivity” (2008: Chapter One). Unsettled by the demonic other of climate change, Klein, for one, takes heart in the growing mass of anti-neoliberal social movements she refers to as ‘Blockadia’ that are increasingly standing up to corporate ‘extractivism’, steadily accruing and generating a new ordinary through a “worldview based on regeneration and renewal rather than domination and depletion” (2014: Chapter 13). Likewise, Beck’s recent work addressing the risk of climate change heralds what he describes as ‘emancipatory catastrophism’ by which the global climate crisis should not be understood as apocalyptic but rather as causing a social “metamorphosis” that he describes as “proceeding latently, behind the mind-walls of unintended side effects” (2015: 81). The worst abuses of neoliberalism are actually pushing this metamorphosis, inducing “a basic sense of ethical and existential violation which creates all sorts of new developments – new norms, laws, markets, technologies, understandings of the nation and the state, and international and inter-urban cooperations” (Beck, 2015: 76). This proximity of climate change, may be generative of a growing societal inclination towards *regeneration*. This is not to be read as some simplistic return to nature but rather a gradual recuperation from the demands of

capitalism: a general effort to engage in modes of living that don't stress the planet, which are often also activities that don't stress ourselves.

In other words, in response to our increasing intimacy with the demonic background of climate change, novel and reparative temporalities are surging, growing and thriving in the roots of catastrophe. To reconceptualize this border space, I will return for a moment to Langer's theory of aesthetics, which, in addition to poetry, also theorizes design more generally, and particularly the patterns depicted on folk art from around the world. A vase, for example, might display a design along its outer edge that is simple but repetitive and, Langer suggests, alludes to a greater sense of motion which "is not really movement in the scientific sense, change of place; it is the semblance of rhythm" (1953: 63). In Langer's words, "The immediate effect of good decoration is to make the surface, somehow, *more visible*; a beautiful border on a textile not only emphasizes the edge but enhances the plain folds, and a regular all-over pattern" (Langer 1953, 61). In the context of a mangrove poetics, then, temporality might be conceived as enacted along a thing's conceptual border where it relates to other things in various ways, suggesting, perhaps, a *molten border* rather than a molten core. Materiality is composed through the various interactions of multiple things, but it may have little to do with the internal essence of the things themselves. Rather, materiality is enacted on the border, where things are fuzzy and indefinite and merge with the things around them. In Stengers' work on Whitehead, she describes his notion of materiality as existing in "that which endures": that is, not the event, but the pattern realized by the event" (2011: 186). Novel patterns are now emerging on the border between the Holocene and whatever enduring epoch comes next. This thesis might therefore be understood as a surface unification, a mangrove poesis and an active decoration weaving various things and events together into an aesthetic form that conveys movement, highlighting this liminal space in which change is the only thing that is

certain.

### **'Ontologies must remain thresholds'**

The thick mangals that once encircled the coastline of Florida have receded dramatically since development of the state began in earnest in the early 20<sup>th</sup> century. Areas along the Atlantic Coast have seen an 87% decrease in mangrove acreage since 1970 alone, while areas on the Gulf Coast have lost 44% of their total coastal wetlands in the past hundred years (Florida Department of Environmental Protection, 2011). While there is some evidence that mangrove cover may be increasing as the climate changes (Gedan et al, 2011), this new growth faces the ongoing challenge of extensive and continuous human development along Florida's coastline. If current trends continue, many parts of the state will have no natural protection from rising sea levels, and coastal habitats and real estate alike will become increasingly compromised (Davis et al, 2005). Yet in the spaces unaffected by development or rapid submergence, mangroves will continue to root along the border between ocean and land. This thesis seeks to channel and intensify this liminal force of the mangrove to posit events as also emerging between an active past and a dynamic future, for, following my previous argument, "Ontologies must remain thresholds... What must be sought is neither a total becoming nor a fixed identity" (Manning, 2009: 10). Likewise, Stewart calls for "essences, ontologies, but weak ones. Not situated or qualified ontologies, but ontologies immersed in the middle of things" (Stewart, 2008: 77). Time, in the context of an uncertain climatic future, can be understood as a material and sensory phenomenon through which temporalities "subsist and inhere" (Ansell Pearson, 1999) as climate change gathers in the present through the cultivation of precarious affinities rather than as the continued progression of a predictable and monolithic event. According to Haraway, "metaphors are eminently community possessions whose principle value lies in their growing points" (2004: 3), and the mangrove—settling

between water and land, distributed adventitiously by the tides, harboring life and expanding to cover wide swaths of shoreline—could hardly provide a more appropriate model for experimentation, creativity and regenerativity. It provides an extended metaphor that, according to Law, might serve to “find or make a *pattern* against an endless background of noise” (2004: 109), a conceptual image that Haraway suggests may be what is required to move thinking forward. Transitional events require theory that is weak but persistent, fluid and immense: theory that finds a place to settle, and root or possibly unroot as circumstances permit.

In March 2014, the IPCC released its Second Working Group Report entitled ‘Climate Change 2014: Impacts, Adaptation and Vulnerability’ as part of its Fifth Assessment Report released later in the year. Compiled by a group of leading scientists, the report, in contrast to previous versions, positions climate change as an *existing* issue rather than a future risk, stating, “Observed impacts of climate change are widespread and consequential. Recent changes in climate have caused impacts on natural and human systems on all continents and across the oceans” (Field et al, 2014: 6). It situates these impacts in the context of “a complex and changing world” (Field et al, 2014: 6) that is already experiencing the effects of an altered climate, including heat waves, droughts, floods, and wildfires across the globe, and even acknowledges the “Extreme coastal storm events” that “have caused excess mortality and morbidity, particularly along the east coast of the United States” (Field et al, 2014: 7). This type of decisive recognition is contributing to the growth and expansion of climate change as an emerging future and a mangal of increasing “*richness and density*” (Bachelard, 2000: 54, original emphasis). Indeed, acceptance of climate change is clearly growing, even in the U.S. where there has been strong opposition to any political focus on environmental issues. Billy Causey, director of the Keys’ National Marine Sanctuary, told me that he constantly risked losing his job under the Bush administration by even

mentioning sea level rise, yet despite the current government's sluggish response, he sees enormous changes in general acceptance of the issue in the Keys and beyond. As climate change is refrained through public recognition, subjective experiences of extreme weather and the accrual of other affects, the phenomenon takes on more coherent temporalities and a threshold crossing occurs. This crossing results not in a 'total becoming' for climate change but rather in the widespread confirmation of an extensive, unprecedented and developing event.

The chapters in this thesis function as a creative map of sorts, but a map that is in no way representative. Rather it enables the proliferation of worlds envisioned by the mapmaker, a poesis of islands, and results in "a multiplication of potentialities, rather than an attempt to interpret or explain" (Doel, 1994: 1051). The writing serves as an "intensive bridge" (Guattari, 1995: 59) not only between the climatically and geographically distant Florida Keys and the northeastern U.S., but also between the actualizing present and the virtual future in which we may be living in increasingly unfamiliar climatic conditions. This thesis traces the experienced climate through the past and the future, the atmosphere and ocean, as well as into and out of myself as a subject. It charts a path through the middle of things, cultivating a proximity to salient issues as well as an openness to relevant surprises through a process of archipelagic mapping that seeks "to meet the world not as representation, interpretation, or raw material for exploitation, but as a nearing... a cartography distributed across a field of intensities and durations" (Stewart, 2012: 524). Cartography, in this light, provides a way to account for the fact that the same phenomenon that is causing the Florida Keys to be overcome by the ocean may also be causing extreme weather to visit the northeastern U.S. and other unexpected locations so that, as Steinberg has suggested, movement *is* geography. Mangroves evoke the poetic process of "making worlds" (Hawkins, 2015) and all the complexities, entanglements and relationships that might

entail. They help us “to think about compositional processes of dispersion and change” as well as “to question how did these occur, take hold, endure, but equally, how are they fragile precarious, provisional achievements” (Hawkins, 2015: 259). In a model such as this, cause and effect matter little; instead the resonance between climatic events creates a ‘nearing’, an increasing intimacy, of these issues by calling attention to the affects, expressions and affinities that constitute a changing climate, as well as measurements, representations and physical manifestations around and through which they move. In other words, of greater interest here than the particular outcomes of climate change, who or what is to blame, or how we might be able to mitigate its effects, is the climate’s emergent and relational materiality, a materiality of *thresholds* rather than *forms*, in which “the world and the production of geographical knowledge emerge simultaneously, co-constituting one another” (Greenhough et al, 2005: 370). Through her vital materialism, Bennett encourages us not to live *on* earth, but to live *as* earth in order “to engage more strategically with a trenchant materiality that is us as it vies with us in agentic assemblages” (Bennett, 2010: 111). The climate and its composite events move with and through us, and so climate change is considered here though a cartographic effort that creatively moves and transforms rather than a fixed identity or representation. The future and even present effects of climate change remain unclear; however it *is* clear that we are crossing a liminal zone of indiscernability, “a realm of pure possibility whence novel configurations of ideas and relations may arise” (Turner, 1967: 97). Climate change emerges, then, as a dynamic field of movement created, ordered and enacted during a threshold moment, a transition to explore rather than a condition to interpret.

Whether the sea is rising or falling,  
nothing changes in the enchantment of  
living—moving about endlessly. (Irigaray  
1991, 13)



**Figure 50.** Isolated mangrove island, Long Key, Florida, circa 1973 [image: Flip Schulke<sup>34</sup>]

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