

What can Ecotheology learn from Science-Engaged Theology?

Abstract

The recent popularity of science-engaged theology has prompted several reflections on methodological frameworks and scholarly approaches within the field of science-and-religion. This article seeks to ask what, if anything, ecotheology might learn, both positively and negatively, from science-engaged theology. Is it helpful to think in terms of an ecologically-engaged theology, and, if so, what are its principal features?

The article engages with eight key characteristics of science-engaged theology: a commitment to empirically testable claims; an awareness of the instability of terms like “science” and “religion”; a rejection of overarching typologies; an insistence on very specific research questions; a desire to see science as a source for theology; a wider “theological turn” in scholarly approach; a hope for two-way exchange between scientists and theologians; and an invitation to all theologians to engage with the sciences. In each case, there are potential lessons for ecotheology to learn.

Introduction

The recent popularity of science-engaged theology has prompted several reflections on academic approaches within the field of science-and-religion. In this article, I seek to ask what, if anything, ecotheology might learn from science-engaged theology. Is it helpful, for example, to think in terms of an ecologically-engaged theology, and, if so, what are its principal features?

For some, science-engaged theology represents a potentially radical break from more traditional approaches to science-and-religion, whilst for others, it is better considered as a helpful subdiscipline within the wider science-and-religion stable (Leidenhag 2024a, 402; Harris 2023b, 34). My aim here is not to imply that ecotheology needs to undergo wholesale reformation in light of science-engaged theology, not least because there are several instances where ecotheologians are already aware of the sorts of insights that science-engaged theology might have to offer. For instance, when it comes to focusing on specific local contexts, ecotheologians might even be one step ahead (for a sense of Christian ecotheology's attention to local context see the summaries by denomination, region, and approach in Conradie 2023, 11-15; for a set of examples see Barreto, McGeoch, and Pereira da Rosa 2024). Moreover, I do not want to assume that science-engaged theology has already replaced, or necessarily should replace, the traditional science-and-religion conversation. There may be just as much to learn from the critics of science-engaged theology as there is to glean from its proponents. Instead, my goal in this article is to critically assess how some of the issues raised by science-engaged theology might prompt and sharpen certain methodological reflections within ecotheology.

However, it is not particularly straightforward to offer a concise or widely shared definition of ecotheology. Indeed, one of the purposes of this article is to think further about the variety of ways in which ecotheology is construed and conducted. We might start with the idea that ecotheology involves "reflection on different facets of theology" in light of "cultural concerns about the environment and humanity's relationship with the natural world" (Deane-Drummond 2008, x). Yet the academic study of theological and religious interactions with ecology, nature, and the environment takes place under

several different headings—including “ecothology”, “religion-and-ecology”, and “religion-and-nature”—and it is important to recognize that these different titles imply different priorities and emphases. One important distinction follows the theology/religious studies divide: “ecothology” tends to indicate an internal or confessional stance, whilst “religion-and-ecology” tends to indicate an external or social scientific approach (Bauman 2011, 377). In this article, when I ask, “What can Ecothology learn from Science-Engaged Theology?”, I am interested in a discussion that involves the whole ecothology/religion-and-ecology nexus. In fact, it is exactly these sorts of potential fault lines that deserve further interrogation in conversation with the insights of science-engaged theology.

Science-Engaged Theology

The notion of “science-engaged theology” emerged as a strategic priority of the John Templeton Foundation in around 2017 (Leidenhag 2024a, 403). The first scholars to use the phrase in print were John Perry and Sarah Lane Ritchie in a *Zygon* article from 2018 (Perry and Ritchie 2018). Since then, numerous projects and publications have employed the nomenclature, but a lot of the theoretical thinking has been pursued by Perry and by Joanna Leidenhag, and they co-authored the first book-length treatment of the idea in 2023 (Perry and Leidenhag 2023).

In basic terms, science-engaged theology is “theology which engages the work of natural and human scientists” (Leidenhag 2024b, 3). To flesh out what this entails in practice, the exponents of science-engaged theology invoke three principal images. First, Perry and Ritchie propose an analogy with a Swiss Army knife (Perry and Ritchie

2018, 1087). Their point is that not all questions can be answered with the same methodological tools: some questions require a corkscrew, whilst others require a nail file. For any given question in science-and-religion, there are quite specific parts of theology and quite specific parts of science that will need to be brought to bear on the problem at hand. A second metaphor imagines science-engaged theology as a series of puzzles: miniature theological conundrums to be solved with the help of empirical evidence. As Perry and Leidenhag put it, the aim of science-engaged theology is to “study narrowly-focused theological questions that are already entangled with scientific theories and findings” (Perry and Leidenhag 2021, 247). On this account, many theological discussions already presume certain ideas about the empirical world, and the science-engaged theologian is simply checking these presumptions against the available empirical evidence. The third route into science-engaged theology is to think about science as a source for theology. As Perry and Leidenhag put it, “the local tools and products of the sciences ought to be sources for theological reasoning” (Perry and Leidenhag 2023, 1). According to the Wesleyan Quadrilateral, scripture, tradition, reason, and experience are all legitimate starting points for theological reflection. It is conceivable that science could be considered as a fifth source, but Perry and Leidenhag prefer to think about how science is already implicated in the four existing sources (Perry and Leidenhag 2023, 50). Scientists read the “Book of Nature” in similar ways to how theologians read scripture; scientific discourse operates according to a tradition of learning that is bound by certain institutions and practices; science is understood to proceed on a logical and rational basis; and scientific work depends on sensory experience of the world around us, albeit in a formalized and often technologically mediated fashion (Leidenhag 2024a, 405). Together, these three images help to

crystallize something of what science-engaged theology is about. The Swiss Army knife analogy highlights its “interdisciplinary and pragmatic” nature; the puzzles metaphor emphasizes “highly-localized questions” and “specialized methods”; whilst the science as source idea “gives logical priority to theology” (Leidenhag 2024b, 6-7). The three images overlap in various ways, but they also contain potentially divergent elements, and some scholars prefer to use just one of the images for their definition of science-engaged theology (Kopf 2025, 4).

It is also worth considering the impetus for science-engaged theology. Perry and Leidenhag trace three different motivations for its initiation (Perry and Leidenhag 2023, 7-47; Leidenhag 2024b, 8-10). The first stems from internal shifts within the field of science-and-religion. Work by John Hedley Brooke, David Livingstone, and especially Peter Harrison has increasingly indicated that “science” and “religion” are not transhistorical or transgeographical categories but rather interconnected and context-dependent enterprises (Brooke and Cantor 1998; Livingstone 2014; Harrison 2015; Perry and Leidenhag 2023, 17-20). Science-engaged theology therefore encourages scholars to forgo largescale methodological questions about the overall relationship between “science” and “religion” and focus instead on more specific and more local concerns. Second, science-engaged theology dovetails with the shifting authority of theology over the course of western intellectual history. To abbreviate a complex historical narrative, one could say that modernity placed theology on the back foot, forcing theology to either adhere to the standards of other disciplines or else become an increasingly sectarian and private affair. But the twentieth century saw theology regain academic confidence as a discipline that is allowed to ask, on its own terms, what the sciences can contribute to theological priorities. Third, science-engaged

theology fits well within the postmodern academy, which tends to reject overarching metanarratives or essentialist metaphysics. Science-engaged theology's commitment to interdisciplinary conversation in the absence of stable definitions for some of the key terms is consonant with this reigning anti-essentialism.

So, what might this mean for ecotheology? In what follows, I examine eight specific hallmarks of science-engaged theology. Some of these emerge from its proponents, whilst others are emphasized by its critics. The eight hallmarks are: a commitment to empirically testable claims; an awareness of the instability of terms like "science" and "religion"; a rejection of overarching typologies; an insistence on very specific research questions; a desire to see science as a source for theology; a wider "theological turn" in scholarly approach; a hope for two-way exchange between scientists and theologians; and an invitation to all theologians to engage with the sciences. In each case, I assess what the issue at hand might indicate about the way in which ecotheology is conceived and practiced.

Empirically Testable Claims

At the root of the science-engaged theology project is a deeply held commitment to empirical investigation. According to Perry and Leidenhag, it is one of theology's "intellectual virtues" to want to be held to a certain "empirical accountability" (Perry and Leidenhag 2023, 49). In fact, they specifically applaud "risky" theologies that are not afraid of making concrete claims that can be subjected to empirical testing (Perry and Leidenhag 2023, 55). As Jonathan Jong points out, these empirical claims very often lie in the realm of the cognitive, affective, and social sciences—which is a notable

change from the traditional diet of physical and biological sciences that tended to dominate the early decades of the science-and-religion conversation (Jong 2021, 483).

Turning to ecotheology, this commitment to empirical testing meets with a mixed reception. On the one hand, ecotheology has long been interested in empirical engagement. Many ecotheologians point to Lynn White's (in)famous study on "The Historical Roots of Our Ecologic Crisis" as a starting point for the discipline (White 1967). For various historical, genealogical, feminist, and decolonial reasons, ecotheologians are increasingly moving away from White as a founding figure (Bauman 2011, 377-380; Taylor 2016, 277-286). But it is noteworthy how many subsequent studies have been devoted to an empirical assessment of a version of White's central claim (for a summary of this literature see Taylor, Van Wieren, and Zaleha 2016, 318-330). White's argument was that the predominance of anthropocentric thinking within Judeo-Christian theology has been the ultimate cause of much of the environmental destruction of recent times. If this is true, then sociologists ought to be able to find more negative environmental attitudes and behaviours amongst Christians and Jews than amongst members of other faiths. To date, the results of these studies have been largely inconclusive, presumably because there are so many other relevant factors that have to be disentangled. But the key point is that one of the most well-known instigators of ecotheological thinking was making a claim that is, at least in theory, empirically testable.

Moreover, Bron Taylor explicitly argues that some of the central pillars of scholarship in the field (which he prefers to call religion-and-nature) are inherently empirical claims. For example, the notion that "religious ideas are important drivers of environment-

impacting behaviours”, or that “the world’s religions have ideas that can spur environmentally friendly behavior and increasingly are doing so”, cannot just be accepted at face value, but must be proven with social scientific data (Taylor 2016, 296). Together, this cluster of claims forms what Taylor calls “The Greening of Religion Hypothesis”. Again, the results thus far have not been terribly conclusive. But Taylor agrees with science-engaged theology when he insists that “the field needs to move beyond anecdotal information and wishful thinking and develop a much more complex and robust, mixed methods social science to explore the religious dimensions of the quest for environmental sustainability and conservation” (Taylor 2011, 253). It is frustrating that there is not yet sufficient data to reach firm conclusions on either White’s thesis or Taylor’s thesis. As Jong notes in his critique of science-engaged theology, the empirical work that is needed is often not yet available—and this certainly appears to be true here (Jong 2021, 487). But the sentiment is very much in line with what science-engaged theologians are recommending.

However, there are also many ecotheologians who do not follow through on the empirical implications of their theological statements. This is the flipside of Taylor’s argument. He identifies and evaluates four methodological approaches to religious interactions with environmental concerns: “hortatory and normative” studies encourage certain ethical behaviours, but do not engage with the sciences; “historical and anecdotal” studies make a claim about the green credentials of a religion, but do not seek to evaluate it empirically; “qualitative/ethnographic” studies get rather closer to Taylor’s data-driven ideal; but only “quantitative/empirical” studies can, in Taylor’s view, reliably assess empirical hypotheses (Taylor, Van Wieren, and Zaleha 2016, 309). Taylor is particularly worried that partisan protagonists, who are already committed to

either an environmental or a religious agenda, produce work that is confessional and insufficiently neutral to assess the empirical claims being made (Taylor, Van Wieren, and Zaleha 2016, 307). Taylor's sharp contrast between what counts as "confessional" and what counts as "neutral" is subject to debate (Jenkins 2017, 27-28), but the broader point about failing to follow through on the empirical dimensions of a theological claim is pertinent for ecotheology.

To give just one example: many ecotheologians find themselves attracted to a panentheist, or pantheist, understanding of the God-world relationship. Leading ecotheological thinkers, such as Sallie McFague and Leonardo Boff, have argued for panentheism on the grounds that it presumably results in more environmentally friendly behaviours (McFague 1993, 149-50; Boff 1997, 152-54). Lina Langby calls this the "panentheistic argument from environmental concern": panentheism is favored because it is believed to "invoke more responsibility, more care, and a more profound feeling of holiness toward our environment" than classical alternatives (Langby 2023, 56). Furthermore, panentheism is said to contribute directly to "action regarding the ecological and climate crises" (Kerber 2023, 219). There is a clear logic as to why such beliefs might be true: if nature exists within God such that there is a heightened sense of divine presence within nature, then believers may well be prompted to treat nature with greater reverence. Yet there is almost no empirical evidence to confirm these presumptions. In fact, one preliminary study of a select sample of Christian climate change activists indicates that panentheism might be no more motivating than a traditional concept of stewardship (Malcolm and Scott 2025). This is where a science-engaged theologian would suggest that there are new research questions for an ecotheologian to explore and much work to be done.

Nevertheless, it is particularly notable that ecotheologians rarely make claims that require empirical verification by the environmental sciences (as opposed to the cognitive, affective, and social sciences that Jong identifies above). Plenty of works of ecotheology rely on generic scientific accounts of climate change or biodiversity loss, but it is harder to see how, for instance, conceptions of ecological sin would be substantively affected by, say, temperature projections for the year 2100. Empirical environmental science is important for establishing the magnitude, severity, and even irreversibility of the environmental problems at hand—and these insights undoubtedly influence the directions taken in ecotheology—but ecotheologians do not typically put forward ideas that can then be tested by the environmental sciences. This relative lack of engagement with the specific findings of the environmental and ecological sciences is an issue that recurs below in the section on “Science as a Source for Theology”, but it is salutary to wonder whether ecotheologians might be able to engage a wider range of empirically testable claims in their work. As just one example: theological statements about the finitude and contingency of creation could be both nuanced and evaluated on the basis of work in Earth system science about the character of various planetary boundaries (see Richardson et al. 2023).

Terminological Instabilities

Another of the insights at the heart of science-engaged theology is the recognition that “science” and “religion” are inherently unstable categories, varying substantially across time and place. There is no core essence to either “science” or “religion”. As Harrison demonstrates in *The Territories of Science and Religion*, “science” and “religion” are

“not self-evident or natural ways of dividing up cultural territory” (Harrison 2015, 6).

They are not universal propensities of human beings, nor are they necessary features of all human societies (Harrison 2015, 194). It is this anti-essentialist revelation that has prompted so much methodological reflection in science-and-religion in recent years.

Yet ecotheologians face exactly the same sort of terminological instabilities. Words like “ecology”, “nature”, “environment”, and “climate” are just as slippery. Likewise, defining “religion”, “theology”, “faith”, and “spirituality” is as challenging for ecotheology as it is for science-and-religion. Two examples illustrate the wider point.

“Nature” is especially contested. Within the ecotheological literature, Sigurd Bergmann notes how “nature” tends to be interpreted as “creation” in the Abrahamic faiths, is more akin to “life” or “earth” in many African and Asian cultures, yet is closer to “land” for lots of Indigenous groups (Bergmann 2017, 13). There is too much cultural and geographical variability for ecotheologians to operate with a single definition. Moreover, from a theological standpoint, Alister McGrath proposes that “nature” itself “offers no ontology”, whilst Timothy Morton’s *Ecology Without Nature* specifically criticizes the idea of “nature” as a foundational or stable entity that is out there to be preserved, conserved, or restored (McGrath 2001, 133; Morton 2007). Instead, “nature” is arguably better understood as an “interpreted and socially mediated category” that has varied across time and place (McGrath 2001, 133). In addition, many of these definitions of “nature” have sought to isolate humans from ecological systems, thereby contributing to the very problems that environmentalists are seeking to address (Bauman 2011, 384-385). Ecological thinkers have therefore had good reason to deconstruct assumptions about the category of “nature”. This move to rethink “nature” and problematize the

nature/culture binary is in keeping with the anti-essentialism implied by science-engaged theology.

Definitions of “religion” are also hotly debated. “Religion” has received widespread use in the ecotheology/religion-and-ecology field—especially by the “Religions of the World and Ecology” initiative led by Mary Evelyn Tucker and John Grim. This particular project was a notable success, producing a series of edited volumes on each major world religion in relation to ecology that have gone on to define and shape the field (Tucker 2009, 407-408). Yet, in Willis Jenkins’s analysis, “religion is an irreducibly pluralist concept”, and “any field that would anchor itself to it as foundation will find itself dropping into unfathomable waters” (Jenkins 2017, 24). Indeed, the very idea of a “world religion” is often thought to be a colonial attempt at comparison that is a particularly poor fit for Indigenous cultures and traditional ecological knowledge (Jenkins and Chapple 2011, 443; Jenkins 2017, 26). The risk is that, if the practices of Indigenous communities are rendered as “religion”, then they can be privatized, severed from the land, and dismissed in order to enable resource extraction. Taylor is also particularly worried that the category of “religion” is often defined so narrowly that it excludes many nature-based spiritualities that are central to the religion-and-nature conversation (Taylor 2010). Moreover, “religion” is a phenomenon that operates at widely varying temporal and spatial scales, and clarity is needed about whether one is referring to personal beliefs, group dynamics, institutional structures, or global movements. For example, environmental declarations by particular denominations or religious leaders can be very different to the stance of local communities, or the actions of individuals (Haluza-DeLay 2014, 266).

A further feature of these difficulties with terminology is the fact that certain terms are used very differently in different disciplines, stretching and potentially distorting their meaning. Perry and Leidenhag label these “entangled concepts” (Perry and Leidenhag 2023, 57-58). “Ecology” is a good example. It can refer to the scientific study of organisms in relation to their environment, an ethical view about such relationships, a political movement for social change, a metaphor for interconnectedness, or even a framework for interpreting religions (Jenkins 2017, 28). Much ecotheology uses “ecology” in the second (ethical) sense, but clarity is needed about how the concept is entangled, and whether or not its different disciplinary usages overlap.

Ultimately, Harrison admits that, for pragmatic reasons, we have little choice but to continue to use words like “science” and “religion”, albeit in a chastened manner (Harrison 2015, 194). Likewise, critics of science-engaged theology point out that it is still dependent on the terms “science” and “theology” (Grey 2021, 489-490). In the same fashion, ecotheologians are not going to escape words like “nature” or “religion”, but they do need to be forthright about the inherent instability of this vocabulary.

Rejection of Typologies

Given the problems associated with the umbrella categories of “science” and “religion”, one of the key features of science-engaged theology is its explicit rejection of typologies (Perry and Leidenhag 2023, 13-14). Historically, the science-and-religion field has been enthusiastic about such typologies, and numerous proposals have been put forward. The most famous are Ian Barbour’s fourfold model of *conflict, independence, dialogue, and integration*, and Stephen Jay Gould’s notion of non-overlapping magisterial (NOMA)

(Barbour 1990, 3-30; Gould 2002, 47-67). But science-engaged theology seeks to move away from these typological characterizations. Perry and Leidenhag worry that typologies only serve to entrench the idea that “science” and “religion” are natural kinds (Perry and Leidenhag 2023, 15). Historians of science-and-religion also point out that the anachronistic application of Barbour’s popular typology often fails to account for historical complexity, and that biographical accounts afford much greater latitude for nuance and context (Cantor and Kenny 2001). Moreover, typologies are frequently employed normatively rather than descriptively, meaning that they can be misused in service of a given author’s wider agenda. Nevertheless, there is still some discussion about the ongoing utility of typological approaches to science-and-religion, especially in pedagogical contexts (Sollereder 2019; Loke 2023).

This debate about the merits of typologies raises some interesting questions for ecotheology. Several ecotheologians have developed typologies for categorizing different religious approaches to environmental concerns, though they tend to be almost exclusively Christian (Conradie 2011, 3). Rosemary Radford Ruether divides between (typically Protestant) *covenantal* ecotheologies, which emphasize right relationships within the Earth community, and (typically Catholic) *sacramental* ecotheologies, which emphasize communion with the nonhuman realm (Radford Ruether 1992, 205-253). Michael Northcott classifies the various positions taken up by Christian theologians and ethicists writing on environmental themes as *humanocentric*, *theocentric*, or *ecocentric* (Northcott 1996, 124-163). Peter Scott plots Christian ecotheologies on a two-dimensional set of axes: *provincial* approaches remain loyal to traditional Christian doctrine, whilst *secular* approaches lean on philosophies of nature that derive from the natural sciences; each set of approaches is then subject to

modernizing or *anti-modernizing* tendencies, which is plotted on the other axis (Scott 1998). Paul Santmire distinguishes between *apologetic* strategies, which seek to defend the Christian tradition from the accusation that it has legitimized environmental harm, *reconstructionist* strategies, which seek to completely rebuild theological thinking on the environment, and *revisionist* strategies, which seek more moderate updates to Christian doctrine (Santmire 2000, 6-10). Heather Eaton also puts forward a similar scheme of *retrieval*, *reinterpretation*, and *reconstruction* (Eaton 2014, 199). And there are others, including those based on denomination or geography, that could be added to this list. Yet none of these typologies are terribly well known. Certainly, none of them share in the sort of widespread fame enjoyed by Barbour or Gould.

This observation could lead in two different directions. On the one hand, ecotheology could be deemed to be one step ahead. If science-engaged-theologians are correct about the problems associated with typologies, then no additional work needs to be done to encourage ecotheologians to shrug off the constraints of inherited typologies because no such limitations exist. On the other hand, it is worth asking why ecotheological typologies have not caught on. Even in 1998, Scott felt like the “flood” of writing on ecotheology meant that “some sort of typology or system of classification thereby becomes urgent in order to gain some useful overview of the area, recognize existing tendencies and identify new directions” (Scott 1998, 8-9). Nearly three decades later, the quantity of literature in ecotheology has only ballooned. Ernst Conradie also worries that a confusing array of different theologies all claim to be able to undergird environmental concern (Conradie 2011, 1). Pragmatically, or at the very least pedagogically, it is tempting to suggest that ecotheologians would find some introductory typologies helpful. Yet the warnings from science-engaged theologians are

threefold: ecotheologians must remain wary of entrenching any of the unstable terms outlined above; avoid enabling the monopoly of a single typology; and continue to allow for local nuance and creative thinking. Ecotheologians do not want to fall into the twin traps of perpetuating unhelpful narratives or confusing description with prescription (Perry and Leidenhag 2023, 14-15). Any renewed focus on typologies within ecotheology must be about providing entry points rather than fashioning a straitjacket.

Insistence on Specificity

A further central characteristic of science-engaged theology is its insistence on specificity. Instead of asking generic questions about the relationship between “science” and “religion”, science-engaged theology asks how a particular piece of empirical research might help to answer a precise theological concern. For instance, Perry and Ritchie suggest that “what do science and religion say about [...] evolution?” is not a good question because it is insufficiently exact (Perry and Ritchie 2018, 1086). Instead, “what can [the] neuroscience of addictions and the Eastern Orthodox liturgy teach us about moral habit formation?” is a much better question, they say, because it is more specific and therefore more answerable (Perry and Ritchie 2018, 1086). Questions should be narrowly focused, and answers should draw on specific subdisciplines. As Carmody Grey states, “granularity is potent” (Grey 2021, 489).

In an analogous manner, the immediate questions for the field of ecotheology/religion-and-ecology are, as Jenkins puts it, “whose religion?” and “which ecology?” (Jenkins 2017). Specificity is key. Environmental and climatic processes are having such heterogeneous impacts across the globe, and religions are responding in such a wide

variety of different ways, that a single generic question about, for example, religious responses to ecological catastrophe is almost impossible to answer (Haluzá-DeLay 2014, 266). As Randolph Haluzá-DeLay writes, “we should begin to talk more specifically about particular religions in particular contexts” (Haluzá-DeLay 2014, 273). For instance, Hindu debates about whether the divine *Gaṅgā* can overcome the dangerous levels of fecal bacteria in the River Ganges will be utterly different to the way in which North American evangelical Christian eschatologies are fueling skepticism about the existential importance of global average surface temperature increases. The effect of any given religion on environmental behavior also depends on numerous contextual factors, such as whether that religion is a majority or minority faith; the cultural homogeneity of that religious group; and the diasporic, colonial, or historically rooted nature of that community (Haluzá-DeLay 2014, 268). Indeed, it is this lack of specificity in the questions posed that might explain why neither the White thesis nor The Greening of Religion Hypothesis have thus far been settled satisfactorily. Both are empirical claims, but they may well remain unproven until they are posed at greater levels of granularity. One interesting possibility for future research would be to consider how the regional variations predicted by global climate models might be employed to help shape context-specific ecotheological responses. Many such localized studies exist, but they could be further augmented by detailed engagement with scientific outputs that are focused on the region in question (Kirkpatrick-Jung and Riches 2020; Chitando, Conradie, and Kilonzo 2022).

In tandem with their insistence on specificity, science-engaged theologians also indicate a desire to get down to business without too much methodological preamble. Mark Harris agrees that specificity is helpful precisely because it involves getting on

with a problem, and seeing what happens, in much the same way that scientists themselves apply a “trial and error” mentality (Harris 2023b, 22). However, critics of science-engaged theology suggest that it is not quite so easy to dispense with methodological concerns: Grey insists that “the question of method cannot be suspended”; Harris worries that science-engaged theology has “underestimated the relevance of long-running methodological debates”; and Simon Kopf even argues that this “no methodology thesis” should not be taken as an essential feature of science-engaged theology (Grey 2021, 492; Harris 2023b, 34; Kopf 2025, 5-7). Grey concludes that the granular focus of science-engaged theology calls for a more local consideration of methodology: each theological puzzle needs not only empirical findings, but also a sense of how those empirical findings were produced (Grey 2021, 494). This chimes with Perry and Ritchie’s initial suggestion to “work out, as needed, points of methodology on an *ad hoc* basis” (Perry and Ritchie, 2018, 1086). However, Kopf continues to push for the importance of “grand methodology” on the grounds that, in his view, theology should be attempting “consistent reflection on the whole of reality” (Kopf 2025, 6). Harris also questions whether this promotion of specificity is really so new, arguing that science-and-religion “has always included fine-grained activity” (Harris 2023b, 15). The shift is that science-engaged theology prioritizes the granular over the methodological, rather than the other way around (Harris 2023b, 17).

Within ecotheology, there has been less of an issue with largescale methodological debates drowning out more focused case studies—and the relative lack of any overarching typologies attests to this. For instance, Simone Kotva suggests that whilst the “rarefied exchanges” of the science-and-religion debate are rarely embodied in practice, the ecological crisis is already forcing science and theology into an

“unforeseen togetherness” in a whole raft of practical situations (Kotva 2022, 46-49).

Given that the vast majority of the global population are religious, many of the projects that seek to mitigate or adapt to climate change inevitably involve scientific collaboration with specific faith groups on the ground. In other words, attending to specific local contexts is already a very natural part of ecotheology. As Celia Deane-Drummond puts it, ecotheology “reminds theologians to stress the grounded and contextual aspect of their work” (Deane-Drummond 2022, 174).

If anything, ecotheology’s problem might be that the balance between the granular and the methodological tips too far in the other direction. For example, Harris worries that the wider methodological questions that he sees as particularly relevant to “ecotheologies and theologies of nature” have been somewhat neglected (Harris 2023b, 23). His concern is that some of the difficulties associated with defining “nature”—as sketched above—risk undermining these same ecotheologies and theologies of nature. Further methodological introspection is needed, he thinks, to avoid naive correlations between the science and the theology. Yet it is not immediately clear that ecotheologies are always aiming to do the same thing as theologies of nature, or at least there are many ecotheologians who are not pursuing the sort of systematic questions implied by an overarching theology of nature. Nevertheless, the advice, it seems, is to remain specific, but without completely neglecting the methodological issues that might arise within any specific arena.

Science as a Source for Theology

Much of the discussion to this point has focused on what ecotheology might learn by considering the analogy of science-engaged theology, but a focus on science as a source for theology draws a more literal connection, highlighting the ecological and environmental sciences themselves. As noted above, in-depth engagements with the precise outputs of these sciences are less common within ecotheology than one might expect.

When thinking about the relationship between science-engaged theology and traditional science-and-religion, Leidenhag suggests that the two streams of enquiry might actually be asking fundamentally different questions (Leidenhag 2024a, 401). Science-and-religion is interested in the overall relationship between two sets of beliefs or spheres of enquiry. This makes intuitive sense because much of the science-and-religion field was forged in an apologetic context to defend theology from the apparent onslaught of the sciences (Harris 2023b, 15; Harris 2023a, 1). By contrast, science-engaged theology asks whether and how science can be a source for theological thinking and practice, so there is no need for the science-engaged theologian to assume such a defensive posture.

This poses a challenge for ecotheology. Much ecotheological writing also takes place in an apologetic vein, either seeking to bring about an ecological conversion amongst people of faith, or trying to persuade the secular world that religion can be of assistance in the face of the current ecological crisis (Pope Francis 2015, §216-21; Hulme 2017). Recently, there has been a move towards ecotheological writing in a more therapeutic vein since religions may contain some of the wisdom and coping practices that are needed as the catastrophe continues to unfold (Malcolm 2020; McCarroll and Kim-

Cragg 2023). For many thinkers, the whole *raison d'être* of ecotheology is to bring about, or measure, social change; it is inherently practical, contextual, and political (Gottlieb 2006, 7). None of this literature is wrong. In fact, it is sorely needed. But these approaches do run the risk of instrumentalizing theology for either apologetic or therapeutic purposes. When new theological concepts are proposed, they are often developed and employed with one of these other goals in mind.

Yet science-engaged theology prompts ecotheologians to ask whether the findings of the ecological and environmental sciences might serve as a resource for theology in its own right—and such engagements are much rarer. As Deane-Drummond highlights, ecotheologians have “not always taken the details of the science seriously enough” (Deane-Drummond 2022, 174). To return to McFague’s panentheism, it is possible that this could be chalked up as an example of science being used as a theological source. McFague certainly claims that her work “uses science as a resource for theology”, and she is adamant that viable theology must be “commensurate with contemporary science” (McFague 1993, ix, 149). She arguably holds a panentheist position precisely because of scientific descriptions of the ecological crisis. However, McFague’s theology does not make empirical claims that can be adjudicated on the basis of the *ecological* sciences. One could consider the world as the body of God without necessarily knowing anything specific about living organisms, ecosystems, or the biosphere. It might be possible to assess McFague’s implicit claim that panentheism leads to improved environmental attitudes and behaviours on the basis of the *social* sciences, as indicated above, but much of this work is yet to be done. As such, her ecotheology is arguably science-inspired, but not necessarily science-engaged.

This is also a pattern that applies more generally to science-engaged theology. According to Jong, much science-engaged theology is insufficiently dependent on the science in question (Jong 2021, 484-485). For Jong, the science ought to alter the theology in the same way that premises alter conclusions; the differences ought to be substantive rather than superficial. Plenty of interesting theology might be science-inspired, he argues, but it is not strictly science-engaged unless removing the science makes a tangible difference to the theology. For Jong, science-inspired theology uses scientific knowledge to “vivify” the theology, but it is not essential to it (Jong 2021, 484). Reassuringly, perhaps, ecotheologians are not alone in struggling to say how scientific sources make a tangible difference to the theological direction that is taken. Jong evaluates a whole series of examples of science-engaged theology from a special issue of *Modern Theology*, and very few of them live up to his critical scrutiny (Jong 2021). As Perry and Leidenhag admit, “using science as a source is one thing, doing so well is far more difficult” (Perry and Leidenhag 2023, 7). The ecological and environmental sciences are certainly prompting and inspiring theological thinking, but it is less common to find ecotheologians posing theological questions where these sciences are being consulted as a source. Science-engaged theology therefore opens up the possibility of a much more extensive vein of ecotheological research along these lines, where the outputs of the environmental and ecological sciences do make a substantive difference to the theology in question.

The Theological Turn

Science-engaged theology is quite clear that it is seeking to answer explicitly *theological* questions about aspects of doctrine and practice (Leidenhag 2024a, 406). Harris therefore identifies the science-engaged theology mindset as part of a wider “theological turn” in the science-and-religion field (Harris 2023a, 1; Harris 2023b, 15). Some of this stems from theology’s new boldness within the academy, but it also re-opens discussions about the possibility of theology assuming a rather more “imperial” role as the “queen of the sciences”—something which Perry and Leidenhag want to resist (Perry and Leidenhag 2023, 31; Harris 2023b, 21, 30). Whilst there is reason to welcome the new-found confidence of the theological turn, there are also some risks to be borne in mind. Science-engaged theology does not seek to actively exclude other faith traditions—it is perfectly possible to pursue Islamic or Jewish theology in a science-engaged fashion (Malik 2021; Malik 2022; Tirosh-Samuels 2023)—but there is a concern, especially in western universities where the theological norm often remains Christian, that the theological turn in science-and-religion will do little to challenge the Christian dominance of the field. Indeed, Harris notes that science-engaged theology might be a helpful label precisely because it is more honest about the fact that the vast majority of what has been written in science-and-religion is really about Christian theology rather than religion in general (Harris 2023b, 13). Another risk of the theological turn, especially if science-engaged theology were to completely replace science-and-religion, is that a religious studies approach to the science-and-religion conversation gets lost. As Harrison remarks, the category of “religion” retains importance for science-and-religion because it “serves as a caution against simply reducing religion to theology” (Harrison 2021, 477). Science-and-religion is much broader than just theology because it also includes philosophical, sociological,

psychological, anthropological, and historical questions (Kopf 2025, 17). Nor should this be a zero-sum game: an increasing focus on theological questions does not have to come at the expense of religious studies concerns.

So, where does the theological turn in science-and-religion leave ecotheology? Perry and Leidenhag suggest that ecotheology might already be a good example of what they hope science-engaged theology will achieve (Perry and Leidenhag 2023, 46). They want to be able to speak, they say, of biological theology, psychological theology, and geological theology, in the same way that we already speak of historical theology, philosophical theology, and ecotheology. What this means in practice is that there are “theologians who are particularly adept and attentive to the use of the tools of [...] ecology in their constructive work—without fears that we are somehow diluting theology or selling-out” (Perry and Leidenhag 2023, 46). But if ecotheology has already negotiated the theological turn successfully, then there are also some concerns it has to face. Is ecotheology at risk of assuming a Christian norm, or downplaying the insights of religious studies?

In practice, Christian exclusivity has arguably been marginally less of a problem for ecotheology than for science-and-religion. Christianity has certainly been a central player in ecological conversations, but a keen awareness of the interconnected nature of planetary crisis has meant that ecotheologians of all stripes have always been naturally inclined to consider an interfaith approach (Haluza-DeLay 2014, 269). The comparative work of Tucker and Grim in the “Religions of the World and Ecology” initiative also did much to shape the field in an explicitly interfaith direction. But it would

feel like a retrograde step if the theological turn implied by science-engaged theology were to limit the extent of future interfaith engagement in the ecotheological sphere.

Likewise, the prominence of the “religion-and-ecology” label—especially at the American Academy of Religion—means that a religious studies approach to climate, nature, and the environment is not realistically at risk of being lost. If anything, the shift has been in the other direction. In 2007, *Ecotheology*—one of the leading journals in the field—was re-named as the *Journal for the Study of Religion, Nature, and Culture*.

Several other factors were undoubtedly at play, but in his opening article for the re-named journal Taylor is quite clear that, in his view, a focus on theology (or even on worldviews) is “unduly confining and insufficiently welcoming” (Taylor 2007, 8). The move caused a good deal of debate. Mark Wallace, in his response, pushes back against Taylor’s characterization of theology as “the crazy uncle in the attic”, arguing that theology can be open-minded and even “methodologically agnostic” in the way that Taylor desires (Wallace 2009). Actively excluding theology, says Wallace, would be to implement the very boundary policing that Taylor wants to avoid. But the key point is that ecotheology/religion-and-ecology/religion-and-nature re-emphasized its religious studies dimension not long before science-and-religion started to re-emphasize its theological dimension. Again, the two approaches need not be in competition; coalitional thinking may well be the most fruitful way forward. But suffice to say that ecotheology is unlikely to suffer from any of the potential dangers of the theological turn any time soon.

Two-Way Traffic

One of the early ripostes to science-engaged theology was the concern that the sciences have as much to learn from theology as theology has to learn from the sciences, and that we should therefore be calling for a theology-engaged science (Torrance 2018). In part, this is about paying attention to the theological and metaphysical dimensions of the practice of the natural sciences (Grey 2021, 490). It might also involve allowing theological commitments to sway a decision between two equally plausible scientific theories or to inform which scientific questions are deemed worth investigating (Harrison 2021, 481). But, at root, theology-engaged science simply asks how theological discussions can also shed light on scientific discussions. Many examples of science-engaged theology in action have been published, but two in particular pertain to ecotheology, and both of them happen to illustrate the parallel possibility of theology-engaged science—and hence of two-way traffic.

First, Matthew Whelan suggests that the science of agroecology can “concretize” Catholic social teaching’s concern for the environment (Whelan 2021, 432).

Specifically, a theological reliance on natural law implicates certain empirical realities: if there are principles inherent in nature, then agroecology ought to be able to help fill out their content. But Whelan goes on to propose that Catholic social teaching’s account of integral ecology also supplements agroecology by helping it to tease out its own moral vision (Whelan 2021, 410, 431). The relationship is not necessarily completely symmetrical, yet “just as social teaching can benefit from engaging agroecology, agroecology can benefit from engaging social teaching” (Whelan 2021, 432). Ideas flow in both directions.

Second, Bethany Sollereeder asks whether theology can help us to understand the human role in environmental restoration (Sollereeder 2021). Restoration ecology does not necessarily contain the tools for making moral judgments about how much human interference is required and what benchmark should be set for a given restoration project. Sollereeder discusses four positions in Christian anthropology—stewards of creation, created co-creators, priests of creation, and participants in the community of creation—to make suggestions about legitimate levels of human intervention. The constraints and predicted impacts of certain practices in restoration ecology could be used to decide between different theological anthropologies, but Sollereeder frames her article the other way around, asking how the different theologies might impact the practical decisions that restoration ecologists have to make. The first approach demonstrates science-engaged theology, whilst the second approach is a good illustration of theology-engaged science.

Together, these two examples indicate how science-engaged theology might apply quite directly to ecotheological concerns. Moreover, both Whelan and Sollereeder remind ecotheologians that the lessons of science-engaged theology would ideally involve two-way traffic.

An Invitation to all Theologians

Finally, science-engaged theology is an explicit invitation to *all* theologians that they might like to consider scientific and empirical work in their thinking. As Leidenhag writes, science-engaged theology “encourages all theologians, across the many

traditions and institutional communities of theology, to use scientific research to aid their work when appropriate” (Leidenhag 2024b, 1).

By analogy, ecotheologians may well want to encourage *all* theologians to see ecological concerns, both scientific and political, as an important touchstone throughout their work. Every theologian stands to benefit from thinking about their work as taking place in a specific ecological and climatic context—in this case, a context of accelerating global heating and the planet’s sixth mass extinction event. Deane-Drummond proposes that “we are all charged with the task of taking our current ecological and global climate scientific context seriously, whether, as theologians, we choose to use the language of eco-theology or not” (Deane-Drummond 2022, 173). Meanwhile, Conradie, in his summary of ecotheology for the *St Andrews Encyclopaedia of Theology*, suggests that “an ecological awareness is now found as a transversal in most forms of theological reflection” (Conradie 2023, 27). This is exactly the state of affairs that a science-engaged theologian would want for ecotheology: namely, a sense that theologians of all stripes are, to varying extents, engaged with the present context of ecological breakdown. To put the point somewhat provocatively, we might wonder, for example, whether it is even possible to write a contemporary theology of sin without considering ecological sin, or a contemporary theology of community without considering nonhuman communities, or a contemporary eschatology without considering the ultimate fate of life on Earth. Ecotheologians certainly hope that other theologians feel an impetus to bear such concerns in mind. But ecologically-sensitive theology also needs to emerge organically, by invitation rather than by diktat.

Conclusion

In this article, I have sought to ask what, if anything, ecotheology can learn from science-engaged theology. The results are not as straightforward as a simple list of recommendations, not least because many scholars in ecotheology already have many of these issues in mind, but a brief summary is still in order.

First, ecotheologians are, and should continue to be, in the business of making empirically testable claims. Central ideas, such as the White thesis and The Greening of Religion Hypothesis, are already subject to empirical scrutiny, but there is plenty of room for ecotheologians to submit their assumptions, especially about the practical efficacy of specific doctrines, to more rigorous social scientific testing, and to formulate new research questions that make use of a wider range of empirical results. Second, ecotheologians are already well aware of the fluid and contested character of the terms they employ. Science-engaged theology serves as a salutary reminder of just how quickly terminology can ossify, and the misguided essentialism that can follow. Third, ecotheologians might like to think about the pragmatic and pedagogical benefits of establishing some widely shared typologies. However, they should only do so if they are willing to heed the warnings of the science-engaged theologians about the degree to which such typologies risk entrenching unhelpful narratives and categories or occluding the nuances of context. Fourth, there is certainly scope for reminding ecotheologians about the potency of granularity. Many studies are already embedded in specific times and places, but it is useful to refresh the insight that there are only ever multiple answers to largescale questions about, for example, religious views on climate change. Fifth, science-engaged theology challenges ecotheologians to see if they can allow the

environmental and ecological sciences to serve as a source for theological questions. This is not easy to do, and it would severely limit ecotheological reflection if it were the only mode of thinking permitted, but it is a helpful corrective to the tendency to instrumentalize religion in the service of solely ecological agendas, and could open up a comparatively under-explored branch of ecotheological research. Sixth, ecotheology needs to remain wary of the theological turn implied by science-engaged theology. Precise theological questions are to be welcomed, so long as they do not presume any sort of Christian, or theological, exceptionalism. Seventh, there is always room for the possibility that ecological scientists can learn from ecotheologians at the same time as ecotheologians learn from ecological scientists. Interdisciplinary dialogue requires two-way traffic. Finally, if science-engaged theologians hope that all theologians consider scientific and empirical work in their thinking, then ecotheologians should hope that all theologians consider ecological insights and contexts in their research. If there is such a thing as ecologically-engaged theology, then these reflections might just provide a starting point.

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