

## EcoTypes: Exploring Environmental Ideas, Discovering Deep Difference

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## **Abstract**

The EcoTypes initiative, launched in early 2017, is a joint research and educational effort focusing primarily on students enrolled in undergraduate environmental courses in U.S. institutions of higher education. EcoTypes was designed for participants to explore the fundamental ideas that shape how they approach environmental issues. They do so via a survey consisting of fifteen key scales or axes (e.g., Aesthetics, Change, or Diversity); in the last two years the EcoTypes survey has been completed approximately 3000 times by students in roughly 50 institutions. These fifteen axes can be gathered via statistical analysis into three themes, including Place (human/nonhuman), Knowledge (old/new), and Action (small/big). The tensions and contradictions inherent in each theme suggest deep difference, an unsettled environmental contradiction with plural truths that cannot readily be harmonized. EcoTypes themes offer participants an opportunity to discover and engage across deep difference in a manner resonant with the coproduction of knowledge, though never toward some static consensus. EcoTypes suggests that the disagreement and difference we commonly experience today are inherent in environmental issues, not simply a matter of differing opinion, challenging us to take seriously the necessity of engagement across difference.

## **Keywords**

Ideas, attitudes, values, survey, difference, paradox, engagement, education

## **Prologue: Deep environmental difference**

The essays in this symposium honor environmental disagreement and difference; why? Don't we instead need to forge consensus and agreement to move forward on issues of environment?<sup>1</sup> We and others embrace a diverse environmental movement and a diversity of opinion. But there may be something deeper, something at the heart of our concern over environmental issues, that generates difference and disagreement, not just diversity or divided opinion.

Climate change, biodiversity loss, environmental injustice, and similar issues are threats to well-being and must be prioritized. In the context of higher education, these issues are what have brought many of our students to environmental studies and sciences (ESS) programs in the first place. They are nonetheless among the most complex issues we collectively face, and these complexities will inevitably grow—this is not a world in which things get simpler. Let us consider deep difference as an acknowledgement that environmental disagreements are more than mere matters of preference, that they also reflect the genuine contradictions we face in grappling with environmental issues.

Students often come to ESS programs with broadly similar backgrounds and interests. But, as they struggle to make sense of environmental issues, more profound differences may arise. Deep difference expresses environmental complexity as paradox, an unsettled contradiction with plural acknowledged truths that cannot readily be harmonized. As our students situate themselves around paradox, they discover the possibility for creative tension. Creative tension is the productive give and take in democratic engagement that happens when complexity is fully embraced as a resource, not as a deterrent, toward more robust solutions.

Creative tension resonates with the first essay in this symposium by Emma Brush (2019), who found inspiration in pragmatist philosophy toward democratic engagement across difference. "Pluralism is the inconvenient truth of environmental politics," Brush says at the outset, yet ultimately recommends "achieving disagreement...fostering engaged and mutually respectful discussion such that better understanding of the basis for contention can emerge." The deep differences that foster creative

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<sup>1</sup> The use of "environment" vs. "the environment" is intentional (Proctor 2009, 2016a; Proctor et al. 2013).

tension may not, however, surface in environmental surveys, as noted in the second essay by Jennifer Bernstein (2019). Bernstein reviews the challenges of quantifying environmental disagreement, especially given the inordinate influence of measures like the New Environmental Paradigm (NEP), which assumes a relatively unified set of environmental norms. As Bernstein warns, “We get into trouble when we valorize [NEP] as the single, penultimate measure of pro-environmental concern.”

My essay on EcoTypes builds on the conceptual and methodological foundations of the previous two, and points toward the two essays that follow, focusing on higher education. Mark Neff and Zander Albertson (2019) argue that “To prepare students to navigate the plurality of policy orientations present in contemporary society requires that universities provide opportunities to engage and practice deliberating across these divides,” yet their preliminary findings suggest that students tend to self-select into relatively homogeneous academic programs, restricting opportunities for dialogue across deep difference. The final essay in this symposium by Susan Caplow (2019) tested EcoTypes in her undergraduate classroom, where “...students articulated that the ‘practice’ with conflict, and the discussion about how to engage with those who disagree fundamentally, was useful to them as they develop their own environmental ideas.”

EcoTypes, in short, resonates with this symposium’s emphasis on the value of environmental disagreement. EcoTypes was designed for ESS students to reflect on their environmental ideas via a series of fifteen axes—e.g., Aesthetics, Change, or Diversity<sup>2</sup>—and ultimately to discover deep difference via three themes underlying these axes—Place, Knowledge, and Action—that express inherent contradictions in how we grapple with environmental issues.

The differences that arise in these EcoTypes themes cannot be resolved by ultimately agreeing nor simply disagreeing; they necessitate engagement with one another in a manner honoring creative tension. Place, Knowledge, and Action, in short, embody key paradoxes at the heart of the environmental issues we care about, summarized via three broad questions:

- What world do we want, and what would be the place of nonhumans vs. humans?
- What old vs. new ways of knowing will help us build the world we want?
- What action at small vs. big scales will help us build the world we want?

In this essay I present a background to EcoTypes, summarize some recent empirical results, and explore what it may mean for ESS students to discover, and engage across, deep difference.

### **Exploring environmental ideas**

Launched in early 2017, EcoTypes is a research and educational initiative that includes online surveys, personalized reports and live graphical displays of survey results, with extensive summaries, reading resources, and references for further study.<sup>3</sup> The EcoTypes initiative has mostly involved undergraduate students enrolled in environmental programs in roughly 50 institutions of higher education across the U.S. Though many—mirroring ESS programs across the country—have been liberal arts colleges in the Midwest and Northeast, institutional representation stretches from Maine to Hawaii, and includes major public as well as smaller private institutions.

As the website’s subtitle suggests, EcoTypes is about exploring—in a conceptually and empirically systematic manner—a diversity of environmental ideas. The term “ideas” is deliberate: in contrast to

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<sup>2</sup> Here and throughout, I capitalize the names of EcoTypes axes and themes so as to distinguish their meaning relative to ordinary usage.

<sup>3</sup> EcoTypes is currently housed entirely on a website; see [jimproctor.us/ecotypes](http://jimproctor.us/ecotypes).

attitudes or values, environmental ideas are more than properties of individual people. Ideas are often conveyed via culture, and institutionalized in laws and moral codes; one can even read a landscape or a place as the physical trace of ideas (Glacken 1967; Cosgrove 1998). And as suggested above, different ideas reflect not only differences among us, but the complexities of the issues about which we are passionate. Ideas are relational: they connect us to environmental issues, turning our experiences of issue complexity into concepts we deploy to make sense of, and resolve, them.

The scope of environmental ideas is bigger than “environment” as commonly understood; thus EcoTypes includes predictable axes such as Ecosystems and Nature alongside less expected axes such as Change, Society, and Time. Environmental ideas are perhaps best approached as *ideologies*, social ideas that circulate in practice and power relations (Zizek 2012; Eagleton 2014), suggesting again their considerable breadth.

To explore environmental ideas is not to withdraw from the gritty world of environmental politics, nor to ignore the physical world of environmental process. It is to ask: what are the ideas—concepts, imaginaries, norms, notions, values—that accompany complex issues of environment, and related understandings, concerns, and (in)actions? Ideas matter: they are the conceptual vehicles that take us places. Some ideas will get you farther than others. Some ideas will do so more quickly, or inclusively, or beautifully than others. Ideas also matter in a literal sense: ideas arise from, and inform, our daily material lives.

As director of environmental studies in a prominent liberal arts institution, my interest in exploring environmental ideas includes education as well as research. Our approach at Lewis & Clark College in Portland, Oregon is for students to consider environmentalism—*their* environmentalism—less as a settled set of solutions, and more as open-ended opportunities.<sup>4</sup> To be open-ended, we need to recognize and systematically explore a broad space of environmental possibilities—ideas. To us, then, exploring environmental ideas puts students front and center as co-creators of a future they will inherit, and pass on to successive generations, as do we to them in the classroom.

### **The EcoTypes initiative and survey**

Though the website is open to all who are interested, EcoTypes exists primarily as a means to explore environmental ideas with college-level students. As of mid-2019, the full EcoTypes survey has been completed approximately 3000 times. EcoTypes started, however, in a much humbler and more focused setting via a series of conversations at annual Breakthrough Institute Dialogues in June 2015 and 2016.<sup>5</sup> In April 2015, environmentalists, scientists, and others associated with The Breakthrough Institute published An Ecomodernist Manifesto,<sup>6</sup> which starts with an ode to the Anthropocene:

To say that the Earth is a human planet becomes truer every day....As scholars, scientists, campaigners, and citizens, we write with the conviction that knowledge and technology, applied with wisdom, might allow for a good, or even great, Anthropocene (Asafu-Adjaye et al. 2015, 6).

These Dialogues conversations concerned higher education: how may our students compare ecomodernism with other contemporary forms of environmentalism? As Bernstein’s essay in this symposium (2019) suggests, many environmental typologies are limited, thus we cannot readily pull one

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<sup>4</sup> See [go.lclark.edu/envs](http://go.lclark.edu/envs).

<sup>5</sup> For Breakthrough Dialogues, see [thebreakthrough.org/events](http://thebreakthrough.org/events).

<sup>6</sup> See [ecomodernism.org](http://ecomodernism.org). As disclosure, I have been a senior fellow of The Breakthrough Institute for the last decade; I was not, however, one of the original endorsers of the manifesto.

off the shelf to help students situate ecomodernism.<sup>7</sup>

I addressed this question in a working paper in June 2016 that expanded prevalent typologies via six “axes of difference” demarcating various forms of contemporary environmentalism—Domain, Nature, Scale, Science, Society, and Time—with each axis defined by oppositional poles. Ecomodernism, I suggested, could be typified via these six axes, in particular what I called its progressive vs. conservative view of Time and its endorsement of orthodox vs. heterodox Science. Its potential limitations could be explored via these axes as well, such as its broadly consensus vs. conflict view of Society and the implications of its emphasis on decoupling for pure vs. hybrid Nature (Proctor 2016).<sup>8</sup>

In fall 2016 I used a sabbatical leave to start building the EcoTypes website, primary survey, and resources. I maintained this approach to ideas as axes, each defined by polar extremes, to give students a sense of the breadth of possibilities. Working with collaborator Jennifer Bernstein, we juried potential survey statements for each axis from a number of existing instruments and added some new ones, ultimately arriving at eight per axis, with an initial total of eleven axes. Throughout the process of developing survey statements and axes we relied on both empirical and conceptual insights—utilizing alpha reliability results from pilot surveys, for instance, as well as benefiting from literature on environmental thought. EcoTypes has intentionally maintained this blend of empirical and conceptual rigor as a way of bridging the common divide between methods- and theory-heavy environmental scholarship.

The online EcoTypes survey was first deployed spring semester 2017, then has been revised in preparation for the 2017-18, 2018-19, and 2019-20 academic years, with revisions following input from colleagues during Association for Environmental Studies & Sciences (AESS) summer conference presentations and workshops.<sup>9</sup> In its current form, the main EcoTypes survey includes the following:

- Fifteen EcoTypes axes (Table 1), each measured as the unweighted average of four survey statements<sup>10</sup> to which respondents agree or disagree on a five-point Likert scale. Axes include Aesthetics, Change, Diversity, Domain, Ecosystems, Ethics, Future, Nature, Science, Social Scale, Society, Spatial Scale, Spirituality, Technology, and Time. These axes are by no means comprehensive; many were added in response to participant input, and others are possible.
- A brief grid-group theory instrument consisting of eight items,<sup>11</sup> summarized for respondents as the quadrant in which their responses place them. Grid-group cultural theory posits two sets of fundamental values emanating from social relations: group (social cohesion) and grid (social hierarchy or authority). Four quadrants result from these two items: Individualist, Egalitarian, Hierarchist, and Fatalist. Grid-group theory has been used in a number of environmental applications.<sup>12</sup>

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<sup>7</sup> For a more extensive review, see [jimproctor.us/ecotypes/instructor-overview/environmental-typologies](http://jimproctor.us/ecotypes/instructor-overview/environmental-typologies).

<sup>8</sup> Decoupling (“...of human well-being from environmental impacts”) is prominent in the Ecomodernist Manifesto; for discussion on the Breakthrough Institute site, see [thebreakthrough.org/search?q=decoupling](http://thebreakthrough.org/search?q=decoupling).

<sup>9</sup> For AESS conferences, see [aessonline.org/annual-conference](http://aessonline.org/annual-conference). For presentations associated with EcoTypes-related sessions, see [jimproctor.us/ecotypes/instructor-overview/related-presentations](http://jimproctor.us/ecotypes/instructor-overview/related-presentations).

<sup>10</sup> Many revised statements were derived from alpha reliability analysis of the initial eight-item scales; others were developed to result in two items for each of the two axis poles.

<sup>11</sup> The short instrument was taken from the International Social Survey Programme, which administered the instrument as part of the ISSP 2000 Environment survey ([www.gesis.org/issp/modules/issp-modules-by-topic/environment/2000](http://www.gesis.org/issp/modules/issp-modules-by-topic/environment/2000)).

<sup>12</sup> For further background, see [jimproctor.us/ecotypes/discover-your-ecotypes/grid-group-scores](http://jimproctor.us/ecotypes/discover-your-ecotypes/grid-group-scores).

- A variety of respondent background and demographic items, including institutional affiliation, class level, and undergraduate major; how concerned, informed, and involved respondents rate themselves with respect to environmental issues; and gender, race/ethnicity, age, childhood location, community size, and economic class, and self-rated political position.

The EcoTypes website has been extensively revised since spring 2017 as well. Each axis now includes a summary page with overview and related survey statements, a live chart of survey results, and a more in-depth “deep dive” with key references. Following survey analysis, these fifteen axes have been gathered into three main themes (Table 2), each with a similar summary page. Additionally, six application topics have been developed to apply EcoTypes axes and themes to environmental issues including activism, climate, conservation, food, health, and sustainability. The site also includes background and instructional resources for instructors, and bibliographic resources. Finally, a brief themes survey<sup>13</sup> was recently added to provide participants with a quicker way to access learning opportunities around themes as suggested below.

### **Survey analysis: EcoTypes axes and themes**

#### General

What can we learn from statistical analysis of EcoTypes survey data collected so far?<sup>14</sup> I will focus on the 2018-19 survey as the most recent for which data are available. From mid-August 2018 to mid-May 2019, the main EcoTypes survey was completed 1455 times by participants from 31 U.S. institutions of higher education, representing small private to large public institutions distributed across the country. Of these completions, about seven percent elected not to store their confidential data, resulting in a 2018-19 analysis N of 1350. One of the fifteen EcoTypes axes (Ecosystems) was added in January 2019, for which we have a smaller N of 595 responses that include all fifteen axes.

It is vital to appreciate what we can and cannot infer from these data. The vast majority of respondents completed the EcoTypes survey as part of an assignment associated with an environment-related undergraduate course; this is not a representative student sample. One must therefore extrapolate these results with due caution; yet the relatively large N, and emergent statistical patterns to be discussed below, suggest that these data merit our attention.

What are the characteristics of 2018-19 respondents? Here are some highlights:

- The typical respondent is a lower-division undergraduate (61%) in an environmental major (37%).<sup>15</sup> Respondents primarily identify as female (62%).
- The sample is somewhat but not highly diverse, possibly reflecting the makeup of many U.S. undergraduate environmental programs (Vincent and Focht 2011). Sixty-seven percent identify as white; 74 percent identify as middle class and above; 67 percent identify as somewhat or very liberal.

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<sup>13</sup> The fifteen-item brief survey includes one statement from each axis, selected via axis alpha reliability. Respondent theme scores from the brief survey are weighted averages, with weightings derived from the factor analysis that resulted in the three themes. See [jimproctor.us/ecotypes/discover-your-ecotypes/quick-themes-survey](http://jimproctor.us/ecotypes/discover-your-ecotypes/quick-themes-survey).

<sup>14</sup> In addition to summary descriptive statistics below, live results from 2018-19 and 2019-20 are available on the EcoTypes site at [jimproctor.us/ecotypes](http://jimproctor.us/ecotypes).

<sup>15</sup> It is possible that the proportion of environmental program majors is higher than this figure, as sixteen percent listed other/not applicable, possibly due to confusion as to how to place their major among available response options.

- Of grid-group types, a strong majority (60%) are scored as Egalitarian; the next highest category, Individualist, score only 23 percent. The Egalitarian grid-group type has been associated with “nature ephemeral,” i.e., a view of the nonhuman world as highly susceptible to human perturbation, thus favoring a precautionary principle approach to environmental management (Mamadouh 1999; Verweij et al. 2006).

### Axes

What are the responses to 2018-19 axis statements? Table 3 summarizes simple descriptive statistics for all fifteen EcoTypes axes. Both the mean and standard deviation offer comparative insights into these fifteen axes.<sup>16</sup> In some cases the overall participant opinion is clear, with the most negative means (i.e., those tending toward the left axis pole) supporting wild Aesthetics, biocentric Ethics, and sacred Spirituality, and the most positive means supporting orthodox Science and institutional Social Scale. It is unclear in some of these cases, however, whether social desirability played a role as compared to authentic participant response.<sup>17</sup>

In many cases, the mean is close to zero (halfway between the two axis poles); but this could be the result of two quite different response patterns, one a normal distribution grouped toward the middle and the other a bimodal distribution grouped at both poles. Standard deviation results (low vs. high) help differentiate the two, suggesting a normal distribution with, for instance, Domain or Ecosystems, and a bimodal distribution with Change or Future.

More generally, while means suggest overall trends in environmental ideas, it is standard deviation results that point toward the EcoTypes objective of identifying differences among respondents. The biggest differences (standard deviations) in responses involve four axes, where both poles proved attractive: Change, Future, Social Scale, and Spirituality.<sup>18</sup> A brief summary of each may help illustrate these differences and suggest the broad overall scope of EcoTypes axes.

- The Change axis concerns whether or not environmental improvements can be accomplished step by step, as expressed via incremental vs. radical poles. Incremental change is broadly supported in common claims regarding the benefits of small environmental actions (Maniates and Princen 2015), whereas proponents of radical change—say, from a position critical of capitalism (e.g., O’Connor 1994; Klein 2014)—find incremental change to be ineffective and politically distracting.
- The Future axis addresses hopeful vs. hopeless outlooks, as summarized via crisis vs. possibility poles. Imminent future crisis has long been part of environmentalism, for instance as expressed in classics such as *Population Bomb* (Ehrlich 1968) or *Limits to Growth* (Meadows et al. 1974); yet more hopeful accounts have also long been present (Cotgrove 1982). More recently, strains of crisis vs. possibility are evident in contrasting work on planetary boundaries (Steffen et al. 2015) vs. opportunities (DeFries et al. 2012).
- The Social Scale axis is similar in some ways to the Change axis: it considers whether individual- vs. institutional-scale actions are the most effective. (It is possible for institutions to effect both incremental and radical change, and conceptually the form vs. scale of action are separable,

<sup>16</sup> Thus the EcoTypes site presents these results as a histogram distribution of results, so that viewers can intuit the mean and standard deviation from the visual shape of data.

<sup>17</sup> One possible example is institutional-scale action, often promoted in environmental courses over individual-scale action; see below for fuller discussion.

<sup>18</sup> For more background on all axes and their opposing poles, see [jimproctor.us/ecotypes/view-all-ecotypes-axes](http://jimproctor.us/ecotypes/view-all-ecotypes-axes). These axis results with higher standard deviations were in part also discovered by Neff and Albertson (2019).

thus the two axes.) Here too, arguments in favor of each are widespread, with individual-scale change being a common thread in environmental discourse (Maniates 2001), while strong evidence favors institutional-scale action (Steinberg 2015).

- The Spirituality axis addresses the role of religion and spirituality in approaching environmental issues, with sacred vs. secular poles. Though environmental concern is generally grounded in science, the role of religion and spirituality has long been debated (Proctor 2009), at least since Lynn White's classic paper blaming Judeo-Christianity for environmental problems—and suggesting a greener Judeo-Christian ethics as one solution (White 1967).

The differences between axis poles highlighted above should not be surprising; they are a part of how we discuss and debate environmental issues, and apparently inform differing positions among respondents who completed the EcoTypes survey. These axes also serve as a reminder that environmental ideas are more than ideas about environment: how change happens, what will happen in future, optimal social scales of action, and sacred vs. secular outlooks may initially seem removed from how we grapple with environmental issues but in fact are quite relevant.

Even within the relatively homogeneous undergraduate environmental classroom, from which most EcoTypes responses arose, difference exists in a wide array of environmental ideas, expressed as EcoTypes axes. If our goal is to mutually discover and engage over difference, there is plenty here to work with.

### Themes

The fifteen EcoTypes axes are interconnected, ultimately relating to the three themes of Place, Knowledge, and Action introduced in the Prologue via a statistical technique called factor analysis (Table 4). Factor analysis attempts to derive a smaller number of factor variables based on associations between initial variables. Factors should not be imagined as clusters; instead, factors are the axes of greatest difference (variance) in the n-dimensional space of the original variables, with the varimax rotation technique followed here ensuring that factors are statistically independent of (i.e., orthogonal to) each other. Factors tell us two important things about EcoTypes axes: (a) how they are associated, and (b) what are their biggest differences. If discovering deep underlying difference is one key goal of EcoTypes, factor analysis is an important statistical means to this end.

Table 4 lists factors in descending order in terms of the amount of variance each explains; they have been reordered in this essay for narrative clarity and given rough equivalence of variance. Each factor is understood via its contributing axes and related poles, as ordered by strength of loading onto the factor. For instance, the Action theme explains the most variance among the axes overall, with five related axes loading onto Action in this descending order: Social Scale, Change, Society, Spatial Scale, and Diversity. The theme name (Action) and its two poles (small vs. big) were derived via interpretation of its contributing axes and poles as summarized in Table 5.

If these three factors were constructed correctly from their contributing axes, what we have in the resultant themes of Place, Knowledge, and Action and their respective poles is a small set of deep differences—differences that, as suggested in the Prologue, are not just matters of preference but strike to the heart of a complex struggle over environmental issues. Most of us will recognize that both poles in each theme are relevant but cannot readily be harmonized—they embody a contradiction inherent in many environmental issues. Following is a summary of each theme, a key question summarizing its internal contradictions, and a brief narrative summary of each contributing axis pole.<sup>19</sup>

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<sup>19</sup> All such text is also available online for each theme; see [jimproctor.us/ecotypes/themes-overview](http://jimproctor.us/ecotypes/themes-overview). For website

1. *Place*. Place results from five axes, including (in alphabetical order) Aesthetics, Ecosystems, Ethics, Future, and Nature. Based on four of these axes—all except Future—this theme speaks to a tension in honoring the place of nonhumans vs. humans in our world; further interpretation suggests that the Future axis relates via the relatively more hopeful valence of the human pole set against typically crisis-driven discourse connected to the nonhuman pole.
  - Key question: What world do we want, and what would be the place of nonhumans vs. humans?
  - Left pole: Nonhuman Place. This pole approaches the place of nonhumans and humans in our world as one in which nonhumans were here first. Bringing together the wild pole of Aesthetics, the biocentric pole of Ethics, the static pole of Ecosystems, the crisis view of Future, and the pure pole of Nature, the nonhuman pole sets aside and prioritizes the natural world, is not particularly impressed with human accomplishments, needs, and impacts, and is not hopeful given the slim likelihood of these views prevailing in future. There can be a place in this world for humans, but only if it does not interfere with nonhuman flourishing, which is the necessary foundation for nonhuman Place.
  - Right pole: Human Place. Human accomplishments and well-being define for this pole the relative place of nonhumans and humans in our world. Building on the crafted Aesthetics pole, the anthropocentric Ethics pole, the dynamic pole of Ecosystems, the possibility view of Future, and the hybrid Nature pole, human Place sees this world as a good place for humans to flourish, a place where change happens and can happen for the good in future. It prioritizes human needs, and accepts—even celebrates—human transformations of the nonhuman world.
2. *Knowledge*. Knowledge results from Domain, Science, Spirituality, Technology, and Time. These five axes are associated with divergent ways of knowing, summarized as old vs. new Knowledge.
  - Key question (following on Place): What old vs. new ways of knowing will help us build the world we want?
  - Left pole: Old Knowledge. One approach to ways of knowing values what we have inherited from the past, what has stood the test of time. The old pole of the Knowledge theme builds on the ideal Domain, alternative Science, sacred Spirituality, fear of Technology, and veneration of past Time to trust these old ways of knowing more than newer approaches. The old pole moves tentatively into the future, leaning more into wisdom than innovation.
  - Right pole: New knowledge. The new pole of the Knowledge theme prioritizes contemporary approaches, those that reflect the advancement of knowledge over time. Weaving together the material Domain, mainstream Science, secular Spirituality, love of Technology, and trust in future Time, this pole may or may not respect past traditions, but certainly places far more emphasis on the recent flourishing of scientific and related forms of knowledge.
3. *Action*. The Action theme results from five axes as well: Change, Diversity, Social Scale, Society, and Spatial Scale. These axes are the most highly correlated of the three factors, with a readily identifiable theme around scales of action (summarized as small vs. big poles) and associated practices of politics.
  - Key question: What action at small vs. big scales will help us build the world we want?
  - Left pole: small Action. Small-scale action, by each of us to build the world we want, is

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examples illustrating each theme pole, see [jimproctor.us/ecotypes/themes-overview/exploring-themes](http://jimproctor.us/ecotypes/themes-overview/exploring-themes).

according to this pole the only practical alternative, one that will eventually make a big (at least bigger) difference. Joining the incremental pole of the Change axis, the low priority Diversity pole, the individual pole of the Social Scale axis, the consensus pole of the Society axis (thus we share equal responsibility to act), and the local pole of the Spatial Scale axis, the small pole of the Action theme is bottom-up ostensibly apolitical through and through.

- Right pole: big Action. Another way to think about what scale of action we need is based on the premise that big problems do indeed call for big solutions. The big pole of the Action theme weaves together the radical Change pole, the high priority Diversity pole, the institutional Social Scale pole, the conflict Society pole (i.e., we are unequal, even in our responsibility to act), and the global Spatial Scale pole to focus on structural, more politicized change. Focusing on the little things we each can do, according to the big Action pole, is not action but distraction.

These three themes remind us that there is no one stable solution to environmental issues, in part because we struggle with these key questions. We all want to make the world a better place, using the best possible knowledge and taking the most effective action; but how exactly we approach Place, Knowledge, and Action raises important differences. This may be the most important lesson students can learn from EcoTypes: that difference provides an opportunity for dialogue and engagement.

### **Implications: Engaging across deep difference<sup>20</sup>**

Difference exists among us all. The fifteen EcoTypes axes (Table 1) express difference in many ways. At times differences can be harmonized, perhaps via a happy medium—say, a Future axis position on issues of environment that is not too full of naïve hope yet does not collapse into utter hopelessness. At other times one must fully hold to one's side—say, a Spirituality axis position that embraces sacred approaches as a deeper way to address environmental issues than secular approaches that downplay spirituality.

We can call these two options Agree and Disagree, respectively. They may apply to certain EcoTypes axes as suggested above. But EcoTypes *themes* arise from broader patterns among these axes, and may point to deeper differences, differences that cannot be resolved via Agree or Disagree. The contradictions inherent in nonhuman/human Place, old/new Knowledge, and small/big Action present an opportunity for a third option, Engage. Each of these three options for dealing with difference presumes a particular notion of truth; each offers particular opportunities and constraints, and is worth further exploration.

Perhaps the most noble option of the three is to strive to find agreement, often via compromise: whereas initially you and I seem to differ, after negotiating for awhile we may discover that we agree. In the Agree case, we work together to find a truth we can both share. There are good examples of striving for agreement around environmental issues, especially in the field of environmental conflict—also called environmental dispute—resolution (O'Leary and Bingham 2003; Dukes 2004).

We all would love to find agreement over environmental issues: this may be why many people are drawn to approaches such as reconciliation or “win-win” ecology (Rosenzweig 2003). But environmentalists are also drawn to actions such as protests (e.g., Fisher et al. 2005; Rootes 2007; Olzak and Soule 2009), where the underlying reality is one of strong disagreement and the imperative is to fight for one's side. In the Disagree case, others hold some notion of truth we find unjustified, possibly

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<sup>20</sup> For further discussion, see [jimproctor.us/ecotypes/about-ecotypes/when-our-ideas-differ-three-options](http://jimproctor.us/ecotypes/about-ecotypes/when-our-ideas-differ-three-options).

even repugnant. We thus choose and fight for our truth.

Whether as a realm of mutual agreement, or the basis for strong disagreement, Agree and Disagree assume truth in the singular. This is understandable, given how we generally approach environmental truth (singular) as of fundamental importance in combating falsehood. But what if difference is a result of fundamentally incompatible truths in the plural, where both appear to have some justification? Maybe this option helps explain current environmental conflicts and the apparent limitations of achieving resolution via Agree or Disagree. Maybe it also applies to the significant, yet not readily reconcilable, truths underlying the EcoTypes Place, Knowledge, and Action theme poles.

Consider what Nobel Prize winning physicist Niels Bohr—known among others for exploring the wave/particle paradox of electromagnetic radiation—had to say:

The opposite of a truth is a falsehood. But the opposite of a profound truth is another profound truth.<sup>21</sup>

Here we can no longer assume truth in the singular, whether via Agree or Disagree; but neither have we embraced full-on relativism, where “truth” is always in scare quotes. This third realm is built on what Bohr called complementarity (Bohr 1937; Plotnitsky 1994, 2014), with paired truths—each accurate, yet incomplete—arising from different ways of interacting with reality, as in the wave vs. particle understanding of light.

How do Bohr’s insights help us approach environmental difference, beyond the options of Agree or Disagree? Perhaps environmental difference, like Bohr’s wave/particle paradox, is not just a matter of differing perspectives, but arises from our differentiated interactions with environmental reality, leading to diverse forms of expertise and diverse truth claims. To get beneath the surface of these differences and discover the “profound truths” of our differentiated expertise takes work, primarily in the form of honest conversation across difference.

Let’s call this option Engage, where we deliberately seek out and interact with people across difference (Proctor et al. 2018). In Engage we remain committed to our own experience of environmental reality as true, yet in the accurate-but-incomplete sense of complementary truths. Engage is a mutual search for the profound truths emanating from our differentiated expertise, and an exploration of the creative tensions and possibilities arising from these complementary truths.

What would Engage mean in issues of environment? The EcoTypes application topics, each of which includes three Take Sides scenarios representing widely differing positions, may assist. As one example, the climate topic includes “Let’s Solve the Climate Crisis With Renewables”; “We Need Nuclear Power as a Bridge Fuel”; and “Climate Change is the Crisis of Civilization.”<sup>22</sup> Those representing these positions could simply have a discussion and look for common ground (Agree), or a debate to see which prevails (Disagree); but Engage would require going deeper than surficial commonalities (e.g., the need for decarbonization) or differences (e.g., nuclear power vs. renewables) to consider how tensions inherent in the three themes of Place, Knowledge, and Action may apply.

The Knowledge theme captures a familiar tension between the second (new Knowledge) and third (old Knowledge) climate positions. This tension, summarized above, is illuminated via the axes contributing to old/new Knowledge: ideal vs. material Domain, heterodox vs. orthodox Science, sacred vs. secular

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<sup>21</sup> This is only one rendition of Bohr’s famous quote on paradox; see [en.wikiquote.org/wiki/Niels\\_Bohr](https://en.wikiquote.org/wiki/Niels_Bohr).

<sup>22</sup> For further details, see [jimproctor.us/ecotypes/ecotypes-application/climate](https://jimproctor.us/ecotypes/ecotypes-application/climate).

Spirituality, past vs. future Time, and phobic vs. philic Technology. Here, new Knowledge ecomoderns advocating nuclear power would engage with old Knowledge anarchists advocating ecoprimitivism, and the terms of their engagement would encompass this wide range of contributing axes. The conversations would undoubtedly be lively! And the tendency to simply adopt Disagree would be strong. But, in the broad scheme of things, those who choose to engage know that both old and new Knowledge may, in their own way, help us successfully address climate change—so they persist.

Via engagement, ecomoderns and ecoprimitivists would discover deep difference, where the bounds of their conversation would likely grow as big as the longstanding question of technology (Heidegger 1977) set against the equally longstanding inquiry into traditional ways of knowing, including religion and spirituality (Weber 1963). Deep difference sets climate, itself perhaps the most complex issue we collectively face today, in the context of even more longstanding issues engaging technology with spirituality, and here a range of experiences and expertise would potentially contribute knowledge toward greater understanding of our climate predicament and ways forward—though never in some readily harmonizable, nor easily disentangled, manner.

The Engage option is hard work. It's hard enough to engage over climate, let alone the range of old and new knowledge claims people invoke to make sense of climate—or, for that matter, connections between climate and nonhuman/human Place or small/big Action. One important conceptual framework that may shed light on engagement is the coproduction of knowledge (Jasanoff 2004). The coproduction of knowledge has been applied to a wide range of environmental issues such as climate, forestry, and food security (Meadow et al. 2015; Puente-Rodríguez et al. 2016; Campbell et al. 2016; Miller and Wyborn 2018; Behe 2018; Djenontin and Meadow 2018). In a manner akin to Bohr's complementarity, coproduction of knowledge builds on the accurate-but-incomplete notion of multiple truths—thus the necessity of co-production via differentiated vs. singular expertise.

From the coproduction approach, Engage remains mindful that truths are never fully objective—rooted solely in the environmental issue of interest—nor merely subjective—rooted in the social construction of truth (Berger 1966; Proctor 1998; Hacking 1999). Environmental truths, as all knowledge, arise from the interaction of knowing subjects with objects of knowledge. Riding this “cusp”—the connection between subject and object in the coproduction of knowledge—is both challenging and eminently rewarding in environmental engagement (Hayles 1995).

Ultimately, EcoTypes—particularly as condensed into the three themes of nonhuman/human Place, old/new Knowledge, and small/big Action—may point to the possibilities of engagement across difference, and the necessity of coproduction of knowledge: collaborative work grounded in creative tension across deep difference. Our students, and other EcoTypes participants, will indeed discover difference as they explore environmental ideas. EcoTypes encourages them to take the risk of engaging across deep difference toward the richer environmental understandings and actions we so much need today.

## References

- Asafu-Adjaye J, Blomqvist L, Brand S, et al (2015) An ecomodernist manifesto
- Behe C (2018) Understanding the arctic through a co-production of knowledge. Presentation, Alaska Center for Climate Assessment and Policy, April 11, Fairbanks Alaska
- Berger PL (1966) *The social construction of reality: a treatise in the sociology of knowledge*. Doubleday, Garden City, NY
- Bohr N (1937) Causality and complementarity. *Philosophy of Science* 4:289–298. doi: 10.1086/286465
- Campbell LK, Svendsen ES, Roman LA (2016) Knowledge co-production at the research–practice interface: embedded case studies from urban forestry. *Environmental Management* 57:1262–1280. doi: 10.1007/s00267-016-0680-8
- Cosgrove DE (1998) *Social formation and symbolic landscape*. Univ of Wisconsin Press, London
- Cotgrove SF (1982) *Catastrophe or cornucopia: the environment, politics, and the future*. Wiley, Chichester
- DeFries RS et al (2012) Planetary opportunities: A social contract for global change science to contribute to a sustainable future. *BioScience* 62:603–606. doi: 10.1525/bio.2012.62.6.11
- Djenontin INS, Meadow AM (2018) The art of co-production of knowledge in environmental sciences and management: lessons from international practice. *Environmental Management* 61:885–903. doi: 10.1007/s00267-018-1028-3
- Dukes EF (2004) What we know about environmental conflict resolution: An analysis based on research. *Conflict Resolution Quarterly* 22:191–220. doi: 10.1002/crq.98
- Eagleton T (2014) *Ideology*. Routledge
- Ehrlich PR (1968) *The population bomb*. Ballantine Books, London
- Fisher DR, Stanley K, Berman D, Neff G (2005) How do organizations matter? Mobilization and support for participants at five globalization protests. *Social Problems* 52:102–121. doi: 10.1525/sp.2005.52.1.102
- Glacken CJ (1967) *Traces on the Rhodian shore; nature and culture in Western thought from ancient times to the end of the eighteenth century*. University of California Press, Berkeley
- Hacking I (1999) *The social construction of what?* Harvard University Press
- Hayles NK (1995) Searching for common ground. In: Soulé ME, Lease G (eds) *Reinventing nature?: responses to postmodern deconstruction*. Island Press, pp 47–63
- Heidegger M (1977) *The question concerning technology, and other essays*, First edition. Harper & Row, New York
- Jasanoff S (ed) (2004) *States of knowledge: the co-production of science and the social order*. Routledge, London
- Klein N (2014) *This changes everything: capitalism vs. the climate*, First Simon & Schuster hardcover edition. Simon & Schuster, New York
- Mamadouh V (1999) Grid-group cultural theory: an introduction. *GeoJournal* 47:395–409. doi: 10.1023/A:1007024008646
- Maniates M, Princen T (2015) Fifteen claims: Social change and power in environmental studies. *J Environ Stud Sci* 5:213–217. doi: 10.1007/s13412-015-0247-7
- Maniates MF (2001) Individualization: Plant a tree, buy a bike, save the world? *Global Environmental Politics* 1:31–52
- Meadow AM, Ferguson DB, Guido Z, et al (2015) Moving toward the deliberate coproduction of climate science knowledge. *Wea Climate Soc* 7:179–191. doi: 10.1175/WCAS-D-14-00050.1
- Meadows DH, Meadows DL, Randers J, Behrens WW (1974) *The limits to growth: a report for the Club of Rome's project on the predicament of mankind*. Universe Books, New York
- Miller CA, Wyborn C (2018) Co-production in global sustainability: Histories and theories. *Environmental Science & Policy*. doi: 10.1016/j.envsci.2018.01.016

- O'Connor M (ed) (1994) *Is capitalism sustainable?: Political economy and the politics of ecology*. Guilford Press
- O'Leary R, Bingham LB (eds) (2003) *The promise and performance of environmental conflict resolution. Resources for the Future*, Washington D.C.
- Olzak S, Soule SA (2009) Cross-cutting influences of environmental protest and legislation. *Social Forces* 88:201–225. doi: 10.1353/sof.0.0236
- Plotnitsky A (1994) *Complementarity: Anti-epistemology after Bohr and Derrida*. Duke University Press, Durham, NC
- Plotnitsky A (2014) What is complementarity?: Niels Bohr and the architecture of quantum theory. *Physica Scripta* T163:014002. doi: 10.1088/0031-8949/2014/T163/014002
- Proctor JD (2016) *Situating ecomodernism via ecotypes*. Sausalito, CA
- Proctor JD (2009) Introduction: Visions of nature, science, and religion. In: Proctor JD (ed) *Envisioning nature, science, and religion*. Templeton Press, West Conshohocken, Penn, pp 3–35
- Proctor JD (1998) The social construction of nature: Relativist accusations, pragmatist and critical realist responses. *Annals of the Association of American Geographers* 88:352–376. doi: <https://doi.org/10.1111/0004-5608.00105>
- Proctor JD, Bernstein J, Brick P, et al (2018) Environmental engagement in troubled times: a manifesto. *Journal of Environmental Studies and Sciences*. doi: 10.1007/s13412-018-0484-7
- Puente-Rodríguez D, van Slobbe E, Al IAC, Lindenbergh DE (Danny) (2016) Knowledge co-production in practice: Enabling environmental management systems for ports through participatory research in the Dutch Wadden Sea. *Environmental Science & Policy* 55:456–466. doi: 10.1016/j.envsci.2015.02.014
- Rootes C (2007) Acting locally: The character, contexts and significance of local environmental mobilisations. *Environmental Politics* 16:722–741. doi: 10.1080/09644010701640460
- Rosenzweig ML (2003) *Win-win ecology: how the earth's species can survive in the midst of human enterprise*. Oxford University Press, New York
- Steffen W, Richardson K, Rockström J, et al (2015) Planetary boundaries: Guiding human development on a changing planet. *Science* 347:1259855. doi: 10.1126/science.1259855
- Steinberg PF (2015) *Who rules the earth?: how social rules shape our planet and our lives*. Oxford University Press, New York, NY
- Verweij M, Douglas M, Ellis R, et al (2006) Clumsy solutions for a complex world: The case of climate change. *Public Administration* 84:817–843
- Vincent S, Focht W (2011) Interdisciplinary environmental education: Elements of field identity and curriculum design. *Journal of Environmental Studies and Sciences* 1:14–35. doi: 10.1007/s13412-011-0007-2
- Weber M (1963) *The sociology of religion*. Beacon Press, Boston
- White L (1967) The historical roots of our ecologic crisis. *Science* 155:1203–1207
- Zizek S (ed) (2012) *Mapping ideology*. Verso Books, London

## Appendix: Tables

Table 1. EcoTypes axes, including their key question, associated left (scored negative) and right (scored positive) poles, and related themes as derived from factor analysis.

Axis	Key Question	Left (-) Pole	Right (+) Pole	Theme
Aesthetics	Is beauty primarily to be found in untouched, wild nature, or in landscapes crafted by humans?	Wild	Crafted	Place
Change	Can we achieve desired environmental change incrementally, or is more radical change needed?	Incremental	Radical	Action
Diversity	Is environmentalism sufficiently diverse given efforts to date, or should broader participation across race and class receive higher priority?	Low Priority	High Priority	Action
Domain	Should we approach environmental issues by focusing more on ideas and beliefs, or on material practices and behaviors?	Ideal	Material	Knowledge
Ecosystems	Are Earth and its ecosystems inherently stable, with change arising from human disturbance, or are they more dynamic over time?	Stable	Dynamic	Place
Ethics	Should we care about the nonhuman world for its own sake, or for how it serves human interests?	Biocentric	Anthropocentric	Place
Future	Is our ecological future most likely one of looming crisis, or of possibility for positive change?	Crisis	Possibility	Place
Nature	Is nature typified by its own inherent order and harmony separate from humans, or is it now fully hybrid, interwoven with humanity?	Pure	Hybrid	Place
Science	Should we trust the ecological findings of alternative claims to truth, or those of orthodox science?	Heterodox	Orthodox	Knowledge
Social Scale	Can individual-scale practices make an ecological difference, or should we focus on key institutions?	Individual	Institutional	Action

Society	Should environmental action build on social consensus, or is it better to assume that social difference and conflict are inevitable?	Consensus	Conflict	Action
Spatial Scale	Is environmental action best taken at local scales, or do we need to find ways to act globally?	Local	Global	Action
Spirituality	Is it best to approach environmental issues from a sacred perspective or a secular perspective?	Sacred	Secular	Knowledge
Technology	Should we be afraid of technology in context of environmental issues, or should we welcome technological solutions?	Technophobic	Technophilic	Knowledge
Time	Should we look back to more harmonious times in past to find environmental solutions, or is it best to move into the future?	Past	Future	Knowledge

Table 2. EcoTypes themes derived from fifteen axes, including their key question and associated left (scored negative) and right (scored positive) poles.

Theme	Key Question	Left (-) Pole	Right (+) Pole
Place	What world do we want, and what would be the place of nonhumans vs. humans?	Nonhuman	Human
Knowledge	What old vs. new ways of knowing will help us build the world we want?	Old	New
Action	What action at small vs. big scales will help us build the world we want?	Small	Big

Table 3. EcoTypes axis means and standard deviations (N = 1350; N [Ecosystems] = 595), derived as unweighted mean of four statements per axis, scored from -10 (left pole) to 10 (right pole).

Axis	Mean	SD
Aesthetics	-2.12	3.53
Change	0.29	4.11
Diversity	1.84	3.26
Domain	0.33	2.57
Ecosystems	-0.60	2.86
Ethics	-2.42	2.98
Future	0.50	4.06
Nature	-0.32	3.19
Science	2.43	3.23
Social Scale	2.39	4.03
Society	-0.88	3.55
Spatial Scale	-0.85	3.73
Spirituality	-2.38	4.05
Technology	1.40	3.38
Time	-0.64	3.17

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Table 4. EcoTypes factor analysis results (N = 595, including all fifteen axes). Factors extracted from mean axis values via principal component analysis, with varimax (orthogonal) rotation; three-factor solution results in clearest factor interpretation. Factors listed in order of overall variance explained. Axis values represent relative weighting as correlations between axis and factor.

Factor	F1–Action	F2–Knowledge	F3–Place
<b>Variance Explained</b>	18.4%	16.4%	13.6%
Social Scale	0.818		
Change	0.807		
Society	0.670		
Spatial Scale	0.655		
Diversity	0.608		
Science		0.771	
Spirituality		0.696	
Time		0.666	
Technology		0.605	
Domain		0.399	
Aesthetics			0.778
Nature			0.713
Ecosystems			0.563
Ethics			0.546
Future			0.292

Table 5. EcoTypes themes and contributing axes, with axis poles—as associated via factor analysis—aiding identification of theme poles.

<b>Theme</b>	<b>Axis</b>	<b>Left (-) Pole</b>	<b>Right (+) Pole</b>
<i>Place</i>		<i>Nonhuman</i>	<i>Human</i>
	Aesthetics	Wild	Crafted
	Ecosystems	Stable	Dynamic
	Ethics	Biocentric	Anthropocentric
	Future	Crisis	Possibility
	Nature	Pure	Hybrid
<i>Knowledge</i>		<i>Old</i>	<i>New</i>
	Domain	Ideal	Material
	Science	Heterodox	Orthodox
	Spirituality	Sacred	Secular
	Technology	Technophobic	Technophilic
	Time	Past	Future
<i>Action</i>		<i>Small</i>	<i>Big</i>
	Change	Incremental	Radical
	Diversity	Low Priority	High Priority
	Social Scale	Individual	Institutional
	Society	Consensus	Conflict
	Spatial Scale	Local	Global