



Feeling skeptical: Worry, dread, and support for environmental policy among climate change skeptics

Kristin Haltinner^{b,*}, Jennifer Ladino^a, Dilshani Sarathchandra^{b,**}

^a Department of English, University of Idaho, United States

^b Department of Sociology & Anthropology, University of Idaho, 875 Perimeter Dr., MS 1110, Moscow, ID 83844:1110, United States

ARTICLE INFO

Keywords:

Climate skepticism
Perceptions of climate change
Climate change and emotions

ABSTRACT

Emotions about climate change are the subject of a growing area of interdisciplinary scholarship. But so far scholars have not studied the emotions expressed by self-declared climate change skeptics; nor have social scientists turned to affect studies to develop nuanced understandings of the constellation of emotions related to fear. Our team conducted 33 interviews and 1000 surveys with self-identified skeptics living in the U.S. Pacific Northwest. The data demonstrates the variability in perspectives, ideologies, and behaviors among skeptics themselves in new and unique ways, including tracking skeptics' emotions about climate change. This article focuses on worry and dread. We find that those who believe climate change is a hoax, and skeptics who are politically conservative, tend to express less of these two emotions, as do men who identify as skeptics. Religiosity, as measured by frequency of religious attendance, does not significantly correlate with worry and dread; however, specific religious beliefs related to climate change (e.g. "Climate change is punishment for our sins") do seem to increase those two feelings. Negative firsthand environmental experiences are also associated with higher degrees of worry and dread. Perhaps most significantly, our data suggests that worry and dread correlate strongly with environmental concern and policy support.

Our interdisciplinary approach has several methodological advantages. First, affect studies encourages more nuance in emotion language, including more detailed definitions of emotions like worry and dread, which simmer over time, as opposed to discrete emotions like fear, which are shorter-lived. Second, sociological approaches remind us that emotions function within particular political, historical, and cultural contexts, which are fundamentally shaped by power structures. Finally, humanities scholars can provide useful input both in research design and the interpretation of results by helping craft survey questions and data codes, and by providing close attention to the language of the survey and interview responses. Combined with quantitative data, this multi-pronged methodology brings together forms of knowledge from the humanities and social sciences. Our approach serves as a model for new work in the growing field of empirical ecocriticism and expands the boundaries of the environmental humanities.

Literature

The United States has been notoriously slow to react to the climate crisis, but more Americans are feeling its emotional impacts. Emotions inform cognition and motivate people to action (Damasio, 1999), and emotions impact perceptions of risk and decision making (Roeser, 2012). Slovic and colleagues developed an "affect heuristic" to measure these impacts (Slovic et al., 2002), and more recent studies build on this work to identify the psychological barriers to concern about

environmental issues: phenomena such as psychic numbing, compassion fatigue, and pseudo-inefficacy (Slovic and Slovic, 2015). Climate science, particularly in its quantitative form, doesn't spark engagement on its own. The way people feel about the science, and about climate change itself, is essential to understand

Which emotions are most likely to motivate people to act on climate change is an open question. Some researchers suggest that positive emotions are more likely to generate prosocial behaviors than negative emotions (Ring, 2015; O'Neill and Nicholson-Cole, 2009). Others, like

* Corresponding author.

** Corresponding author.

E-mail address: khaltinner@uidaho.edu (K. Haltinner).

Head (2016), warn that expectations of positivity in the face of climate change can be obstacles to dealing with it; she contends we need to face our negative emotions, including grief, head-on and cultivate a carefully practiced hope, grounded in concrete action. Cunsolo and Ellis (2018) expect ecological grief will become more common with climate change and that there will be ample “grief work” to do (279).

Our paper highlights a different set of negative emotions: fear and its variations—worry, anxiety, and dread—which, alongside grief and sadness, are becoming commonplace. The Yale Program on Climate Change Communication reports that two of every three Americans (66%) are at least “somewhat worried” about global warming, while one in four (26%) are “very worried” (Leiserowitz et al., 2020). Understanding these worries, the forms they take, and the objects that trigger them, are urgent priorities as concern about the climate crisis grows.

Our interdisciplinary research team interviewed and surveyed a group of people unlikely to be worried: self-identified climate change skeptics. We focused on skeptics living in the U.S. Pacific Northwest. Using data from 1000 surveys and 33 interviews, our project explores the relationship between skeptics’ self-expressed feelings of worry and dread, their concerns about environmental issues, and their support for environmental policy. Our literature review differentiates between fear, dread, anxiety, and worry, focusing on the affordances of worry, which we distinguish from anxiety. Anxiety can be pathologized, and it may be shunned by conservatives who might be inclined to see anxiety as a “snowflake” emotion held by weak liberals.¹ Worry is especially useful in pinpointing “objects of care” (Wang et al., 2018) and generating lasting concern without the feelings of overwhelm associated with fear.

We then explain our findings. First, we identify a series of predictors that increase skeptics’ likelihood of feeling worry or dread related to climate change. Women skeptics experience more of both emotions than men, and people with certain religious beliefs have higher levels of worry and dread than their peers; but those who believe climate change is a hoax express lower levels of worry and dread. Skeptics who identify as more politically conservative are less likely to express these emotions than their more progressive counterparts. Second, we explore how skeptics’ experiences of worry and dread correspond to their environmental views (see Tables 1-3). Our qualitative data helps explain “why people feel specific, or any, emotions about climate change” (Wang et al., 2018). We find that skeptics who report higher levels of worry and

Table 1
Sociodemographic characteristics (N = 1000).

Characteristic	Full Sample Mean (SD) % (Frequency) (N = 1000)
Gender	
Women	49.9% (499)
Men	49.0% (490)
Other	1.1% (11)
Political ideology (very liberal = 1 to very conservative = 7)	4.55 (1.50)
Age (18–19 = 1 to >80 = 8)	4.54 (2.04)
Education (less than high school diploma or equivalent = 1 to doctoral degree = 8)	3.70 (1.83)
Race	
White	89%
Other	11%
Income (\$0–\$24,999 = 1 to \$100,000 and above = 5)	2.69 (1.41)
Religiosity (never attend religious services = 1 to attend services more than once a week = 7)	3.03 (2.19)

¹ For an example of the “snowflakes” discourse in regard to climate change emotions, see Jennifer Atkinson’s (2018) response to critics of her course on climate grief, which was reprinted widely: <https://www.hcn.org/articles/opinion-addressing-climate-grief-makes-you-a-badass-not-a-snowflake>.

Table 2
Unstandardized coefficients from multivariate OLS regression models explaining emotion-based reactions to climate change (standard error in parenthesis).

Predictors	Worry	Dread
Gender (male = 1)	−0.31** (0.10)	−0.28** (0.09)
Religiosity	0.01 (0.02)	0.03 (0.02)
Religious ideation	0.08* (0.04)	0.12*** (0.04)
Conspiracy ideation (“climate change is a hoax” = 1)	−0.77*** (0.12)	−0.50*** (0.12)
Political ideology (liberal-conservative)	−0.26*** (0.03)	−0.27*** (0.03)
F	35.44***	27.76***
Adjusted R-square	14.7%	11.8%
N	1000	1000

Note: *p < 0.05 **p < 0.01 ***p < 0.001.

Table 3
Unstandardized coefficients from bivariate OLS regression models explaining influence of climate change worry and dread on pro-environmentalism (N = 1000).

	Emotion	B (SE)	R-square	F	F-value significance
Negative environmental experiences (IV)	Worry	0.29*** (0.02)	12.4%	140.74	0.00
	Dread	0.27*** (0.03)	10.2%	113.46	0.00
Environmental concern (DV)	Worry	0.39*** (0.02)	20.9%	264.42	0.00
	Dread	0.33*** (0.02)	14.4%	167.90	0.00
Pro-environmental policy support (DV)	Worry	0.29*** (0.03)	11.0%	123.02	0.00
	Dread	0.25*** (0.03)	7.8%	84.91	0.00

Note: *p < 0.05 **p < 0.01 ***p < 0.001.

dread are more likely to be concerned about various environmental issues and support more pro-environmental policy initiatives than their less worried or dreadful peers. Of particular interest is our finding that, even among climate change skeptics, concern about places and people impacted by climate change may still elicit worry and dread. These results suggest important implications for climate communication and environmental policy, which we address in our conclusion.

1.1. Climate change emotions: worry, dread, and objects of care

Research is inconclusive, even contradictory, when it comes to fear’s role in shaping attitudes and behaviors. Research in the sciences often concludes that fear shuts us down, encourages insular, xenophobic thinking, and fosters conservative politics (Feinberg and Willer, 2011; Ring, 2015). Some research in psychology suggests political conservatives react more strongly to perceived threats (Pedersen et al., 2018). When those threats are related to climate change, the same thing happens, people shut down, build walls, or bury their heads in the metaphorical sand. Both Stoknes (2015) and Norgaard (2011) tie fear to climate change denial. Their research warns that framing climate change as an “encroaching disaster” fosters a sense of “helplessness” and encourages avoidance—a desire to resolve any “worry and dissonance” we are feeling (Stoknes, 2015; Norgaard 2011). Similarly, Marshall (2015) elucidates specific cognitive processes, including confirmation bias, disattention, and framing, that contribute to climate change denial.

Yet others embrace fear’s motivating potential. Wallace-Wells (2019) faults scientists for relying on “social science suggesting ‘hope’ can be more motivating than ‘fear’—without acknowledging that alarm is not the same as fatalism, that hope does not demand silence about scarier challenges, and that fear can motivate, too.” He applauds the 2018 IPCC report for “embracing fear” and rhetorically signaling to

readers that “*It is okay, finally, to freak out*” (157). Perhaps the *Nature* study Wallace-Wells cites is right: there is no “best way” to tell the story of the climate crisis, and no emotional response is “too dangerous to try” (Chapman et al., 2017). But since uncertainty is among the “hallmarks of climate change prediction,” and consequently, “a generalized worry about the future is now commonplace,” (Albrecht, 2019, 76–77) it is important to pursue a more finely grained sense of how fear and related emotions function.

New words for fears about climate change are proliferating. Sobel’s work on ecophobia foregrounds how “the overwhelmingness of environmental problems can breed a sense of ennui and helplessness” (2007, 17). Estok (2018, 1) also claims the term ecophobia, which he defines as a “human psychological condition” marked by “fear, contempt, indifference ... towards the natural environment.” A special cluster in *ISLE: Interdisciplinary Studies in Literature and Environment* identifies both positive manifestations of ecophobia, such as Indigenous Reverential Eco-Fear (Rayson and Deborah, 2019), and negative ones, such as “panphobia,” an extreme feeling of apocalyptic fear (Hartman and Degeorges, 2019, 463). A more mainstream way to describe the growing sense of “generalized worry” is with the APA’s term “ecoanxiety”: “a chronic fear of environmental doom” with symptoms ranging from low-grade concerns to full-on panic attacks (Clayton et al., 2017, 27, 68).

Despite the neologisms, many scholars still use fear terms interchangeably. Ray (2020), for example, suggests climate anxiety might encompass pre-traumatic stress disorder, eco-grief, or “a feeling of dread about the future combined with a feeling of powerlessness to do anything to shape that future.” Our research suggests anxiety, worry, and dread are distinct emotions. A close cousin to fear, dread manifests as a sinking feeling, a paralyzing weight in the chest or stomach that is more intense than anxiety. Green (2017) suggests that climate change taps in to our “ultimate concerns” around suffering, nihilism, and mortality, and so prompts a kind of “existential dread.” Albrecht coins the phrase “global dread” to describe an “anticipation of an apocalyptic future state of the world that produces a mixture of terror and sadness in the sufferer for those who will exist in such a state” (2019, 199). Dread is an intense anticipatory fear that endures over time.

Worry, likewise, can be a drawn-out emotional state, unlike the basic emotion of fear. Worry is often used as a synonym for anxiety. But while anxiety is a background feeling or a “noncathartic” affect (Ngai, 2005, 6, 21)—usually without an easily identifiable object (Ahmed, 2015, 64–68)—worry is more often tied to specific objects, and it is not reducible to a chronic feeling of ecoanxiety. Our understanding of worry dovetails with Pihkala (2020), Clayton and Karazsia (2020), and Smith and Leiserowitz (2014), who find that compared to fear, which can cause an “amygdala hijack” and lead to avoidance, disengagement, doubt, or dismissal, worry is “a less intense emotion better suited to the issue of climate change. Worry tends to motivate, not short-circuit, more intense cognitive and analytical processing of risk information” (945).

We extend this body of research by showing that even climate skeptics (who typically do not suffer from a “chronic fear of environmental doom”) do express worry and dread, and by beginning to identify “objects of care” that are of concern. We borrow that phrase from Wang et al. (2018), who use it to refer to the “valued objects” that climate change threatens (4). Climate change is not, itself, an “object of care”; rather, we care, and worry, about the people, places, and species that climate change impacts. Because we usually worry *about something*, worry is considerably more likely than anxiety to pinpoint objects of care. Less a “mode of attachment to objects,” which is how Ahmed describes anxiety (2015, 65), our data points to a new definition of worry as *an affective state that directs anxious feelings toward particular objects of care without succumbing to the pitfalls of fear*.

1.2. Emotions and climate skepticism: our contribution

Despite increasing interest in emotions about climate change,

research about climate *skepticism* has not yet focused significantly on the role of emotions. Our research begins to address this dearth of scholarship by examining the relationship between the self-reported emotions of skeptics and the nature of their climate skepticism with regard to factors that theoretically mitigate strong emotional reactions: conspiracy ideation, religious beliefs, gender, and political ideology.

Our data, to which we now turn, suggests that even a significant number of climate skeptics are worried about the future of the more-than-human world, including the plants and animals with whom we share the planet. While worry and dread are themselves closely correlated, they seem to feel and function differently than fear and anxiety. Our findings indicate that skeptics tend to pin their worries on specific objects, such as pollution and threats to other animals, while they dread bigger, more existential threats, such as environmental disasters and their consequences for their home regions, our own species, and the planet itself. Significantly, these concerns exist even though skeptics don’t think of these threats in terms of anthropogenic climate change.

2. Methodology

2.1. The geographic foundation of our sample

We surveyed 1000 people who identify as skeptical about climate change and who live in the Pacific Northwest. In addition to a shared geography, there are sociocultural factors that connect people residing in these three states. For example, according to the Center for the Study of the Pacific Northwest at the University of Washington, Idaho, Oregon, and Washington share a connection and identification with salmon as well as an antipathy towards Californians. Residents of the Pacific Northwest also appreciate low population density and widely available green spaces, which they view as antithetical to California’s “polluted” and “overcrowded” environment (Center for the Study of the Pacific Northwest, 2020).

Obviously, the states’ cultural values vary in a number of ways. Idaho, eastern Washington, and eastern Oregon are more conservative politically than are western Washington and Oregon (Jones 2019). Idaho residents also have higher levels of religiosity (ranked 33rd in the nation with Oregon in 39th and Washington in 44th) and density of climate skeptics (17% vs. 11% in Washington and 12% in Oregon) (Lipka and Wormald 2016; Marlon et al., 2020). Despite these distinctions, our data suggests that skeptics across the region behave similarly along demographic lines in terms of their emotional responses to climate change. We find no statistically significant distinction between Idaho, Washington, and Oregon skeptics with regard to gender, race, or political ideology. They also express similar levels of worry and dread regarding climate change (Appendix Table 1).

In short, skeptics from these three states seem to feel strikingly similarly about climate change, no matter what demographic factors we account for. As such, the Pacific Northwest is an optimal region for studying climate skepticism. We contend our findings can be extrapolated beyond the region to predict the impacts of worry and dread among skeptics’ more broadly.

2.2. Survey data collection and quantitative analysis

Our quantitative data comes from an online survey administered to adults living in the U.S. Pacific Northwest. The survey was distributed via Qualtrics, a firm that specializes in representative online surveys. The University of Idaho Institutional Review Board approved the survey procedure before data collection began. Our data represents U.S. census data for the Pacific Northwest region for gender and education.

The survey began with two screening questions: (1) “climate change is happening” and (2) “climate change is caused by human activities” (response categories: yes = 1; no = 2; not sure = 3). Respondents who said that they believed climate change was happening *and* it was caused by human activities were screened out, limiting our final sample to only

those who expressed uncertainty or denial regarding the realities and human causes of climate change (i.e. climate skeptics). Participants who met the screening criteria then proceeded to answer our full survey, which consisted of forty-five questions about attitudes towards climate change, environment, policy, energy, information, and trust. See sample characteristics in [Appendix, Table 2](#).

Our survey included three questions that specifically asked respondents about their emotions. First, we asked “While thinking about the concept of climate change, to what extent do you feel the following emotions?” with response options anger, disgust, calm, worry, dread, sadness, and grief.² Responses were measured on a Likert scale ranging from “not at all = 1” to “an extreme amount = 7” ([Appendix Tables 3 and 4](#)). We then immediately followed up this question with an open-ended question: “In a few sentences, please explain why you feel the above emotions when thinking about climate change” Subsequently we asked two similar questions about pollution and habitat loss, each with the same response options and Likert scales, with follow-up open-ended questions asking why respondents experience the said emotions.

We also combined several key survey items to construct measurements of pro-environmentalism using standard survey instrumentation techniques. We created *negative environmental experiences* as a five-item scale measuring whether respondents and/or their associates had direct personal experience related to air and water pollution. Our *environmental concern* measure is a sixteen-item scale for respondents’ average concern for a series of environmental issues ranging from coral bleaching to pollution. Similarly, our *pro-environmental policy support* measure is a thirteen-item scale for average support for pro-environmental policy initiatives among climate skeptics. Survey items in this scale ranged from support for investments in solar and wind energy to government regulations for air and water pollution ([Appendix Tables 5, 6, 7](#)).

Additionally, we measured *political ideology* on a seven-point scale from *very liberal* (1) to *very conservative* (7). *Gender* is categorized as men = 1 and women/other = 0. *Religiosity* is measured by asking respondents how often they attend religious services, with response categories ranging from *never* (1) to *more than once a week* (7). *Religious ideation* is a scale of three intersecting beliefs about climate change and religion: “Climate change indicates God’s will,” “Climate change is the end-of-days as predicted in the book of Revelation,” and “Climate change is punishment for our sins” (Cronbach’s $\alpha = 0.78$). *Conspiracy ideation* measures whether participants adhere to the belief that “climate change is a hoax” where we coded responses as *yes* (1) and *no/not sure* (0).

To analyze the survey data, we used a series of bivariate and multivariate OLS regression models, subsequent to checking assumptions of linear regression. We performed all of our quantitative analyses with IBM SPSS 24.

2.3. Interview data collection and qualitative analysis

The qualitative data used in this study comes from two sources: an interview-based project in which we conducted 33 interviews with adults in Idaho who do not believe in climate change and open-ended questions in the survey described above. We conducted the interviews between May 2017 and May 2018. They lasted between 30 and 120 min and were held in local coffee shops. These interviews were semi-structured; they were conversational but used an interview guide to keep the conversation on track. To recruit participants, we hung fliers at grocery stores and posted recruitment advertisements in regional Facebook marketplace pages. We analyzed the interview data using standard inductive analysis and coded with NVivo.

Nearly all of our interview participants were white. One identified as

² Our data shows similar results for sadness and grief, but not for anger, disgust, and calm. We will explore this data, including the common ground between worry and anticipatory grief in a follow-up article.

Latino. Most were men (n = 24, nine women). They held a variety of jobs, including religious leaders, grocery owners, and students. We did not specifically ask about education level, but of those who disclosed this information voluntarily, thirteen earned a BA (six went on to get advanced degrees), and six have some college education but did not graduate. We also did not explicitly ask about religious affiliation, but of those who disclosed this information, all were Christian: four were Catholic and Mormon respectively, three were Evangelical, one non-denominational, and one just identified as Christian. Most people in our sample identified as republicans, conservative, or leaning republican (12). Yet others also identified as democrats (2), anarchists (1), apolitical (1), independent (1), and libertarian (4).

The qualitative data we acquired from the survey is explained above under survey methodology. Given our interest in the experience of emotions, we focused our qualitative analysis on those who answered 1 (“not at all”) and 7 (“an extreme amount”) to the experience of worry and dread. Using standard inductive analysis, we developed a codebook to analyze these responses. Two researchers then coded the data using this shared codebook.

3. Results

3.1. Predictors of worry and dread

To understand what factors explain worry and dread among climate skeptics, we used two regression models, testing the relationship between these emotions and key sociodemographic variables found to be associated with climate change skepticism in prior literature: gender, religiosity, religious ideation, conspiracy ideation, and political ideology. Our results suggest that gender is a significant predictor of worry and dread, with women more likely than men to experience these emotions (b = -0.31, p < 0.01 (worry) and b = -0.28, p < 0.01 (dread)).

Conspiracy ideation is negatively associated with feelings of worry and dread, wherein those who believe climate change is a hoax are less likely to report having these emotions (b = -0.77, p < 0.001 (worry) and b = -0.50, p < 0.001 (dread)). Political ideology is also a significant predictor of worry and dread, wherein those who are more conservative express these emotions at lower levels (b = -0.26, p < 0.001 (worry) and b = -0.27, p < 0.001 (dread)). In contrast, religiosity, as measured by frequency of religious attendance is not significantly related to the experience of worry and dread. However, higher religious ideation leads to increasing worry and dread (b = 0.08, p < 0.05 (worry) and b = 0.12, p < 0.001 (dread)) (See regression results in [Appendix Table 8](#)).

These findings support existing scholarship with regard to gender and emotion. Women’s socialization promotes the expression of emotions such as worry or dread, whereas men are often taught to express those feelings as anger ([Kimmel, 2013](#)). This, coupled with the fact that political conservatives, including women, often hold more rigid beliefs regarding gender roles ([Lye and Waldron, 1997](#)) and that conservatives are more likely to be skeptical about climate change ([McCright and Dunlap, 2011](#)), suggests these gendered patterns are likely magnified in our sample.

We find support for our finding that conspiracy ideation is associated with lower levels of worry and dread in both our interview data and existing scholarship. Interview participants who stated that climate change was a hoax claimed to feel no emotions regarding climate change. Take, for instance, David, an evangelical Christian and Republican. David believes climate change is a hoax perpetuated by the United Nations. David insists he doesn’t have an emotional reaction to climate change. He says: “I’m not a real emotional person. At all. I’m level-headed.” David’s response is at once indicative of men’s socialization regarding emotion – that emotions are irrational and men shouldn’t experience them – and suggestive of the role of conspiracy ideation on one’s emotional state. Existing scholarship suggests that beliefs in conspiracy can reduce feelings of discomfort over a large, complex, and

frightening situation by reducing the problem to the bad actions of a single entity or actor. In doing so, adherents often feel greater agency over a problem, which moderates emotional reactions (Haltinner and Sarathchandra, 2018; Sullivan et al., 2010; Newheiser et al., 2011).

Our findings suggest that, with regard to climate change skeptics, people who are more conservative express less worry and dread than their politically moderate and liberal counterparts. But the relationship between emotions and political ideology is complicated. Conservatives are more likely to be driven by fear of death in their political perspectives than are progressives (Weston, 2008). Recent research has clarified the role of fear, anxiety, worry and dread and political ideology, further suggesting that conservative fears often relate to groups of people they designate as outgroups (Hatemi et al., 2013) or perhaps displace certain fears, such as climate change, onto economic concerns instead (Klein, 2020).

Our quantitative findings suggest no significant relationship between religiosity and worry or dread about climate change. Yet people with higher religious ideation experience slightly higher levels of worry and dread than those without it. The qualitative data we collected helps explain these findings and why they contradict our hypothesis. First, there seems to be a mix of responses to climate change with regard to religion and emotion. On the one hand some people argue that God would not irreparably harm Earth or humanity. For example, James, an evangelical Christian minister and libertarian, does not believe that the Earth's climate is changing. He argues that "God is not trying to kill us off. If he were trying to do that, we'd be dead." James also believes that "God gave us this world as a place to live" and is "going to take better care of our habitat as an ongoing gift." On the other hand, some people believe that climate change is a sign of the apocalypse. For instance, Brent is a white man, politically independent, who was raised Baptist and believes that climate change is a natural phenomenon and not human caused. He argues that, when he thinks about climate change, he "see[s] it as a sign of the times ... End of days."

These two explanations would logically lead people to experience and express different emotions regarding climate change, making it harder to detect the direction of effects in a linear regression model. For James, who doesn't believe in climate change and believes God will protect humanity, it seems likely he would experience lower levels of worry and dread than Brent, who is anticipating an apocalyptic end to the planet. Because our sample is made up of people from a variety of religious sects, it is likely that emotional reactions to climate change vary based on adherents' fundamental religious beliefs. Our findings complicate existing scholarship on emotions and religion that suggests adherence to religious ideologies moderates feelings of discomfort and manifests in heightened well-being for people who attend religious events (George et al., 2002), or are part of a religious community (Zinnbauer and Pargament, 2005; Krause and Hayward, 2012).

3.2. Extent of worry and dread among skeptics

Our data suggests that a significant percentage of skeptics are in fact concerned about climate change; approximately 11.5% of our sample expressed having quite a bit, very much, or an extreme amount of dread and 15.7% expressed these levels of worry. However, we note important nuances in these concerns: skeptics who outright deny that climate change is happening experience less worry (mean = 2.05) and dread (mean = 1.95) compared to their counterparts who express more worry (mean = 3.10) and dread (mean = 2.68). Further, skeptics who are *uncertain* whether human actions contribute to climate change experience more worry (mean = 3.11) and dread (mean = 2.70) compared to those who are *certain* that human actions *do not* contribute to climate change (worry = 2.29; dread = 2.09). Our findings also suggest that worry and dread about climate change correlate strongly with environmental concern and pro-environmental policy support among skeptics. Respondents often connected their fears to specific objects, including species extinction, irreversible pollution, the impacts on

future generations, the sense of being too late, and feeling unable to fix the problem.

While rejecting or remaining uncertain about the critical premises of climate science, skeptics with the highest levels of worry and dread expressed the following statements in our surveys:

"It makes me worry about the way the world will be if it'll have trees, polluted Ocean, or whatever whenever my son is old enough to be able to enjoy what's left of it."

—Rebecca, a white woman in her 50s from Seattle, Washington

"There is so little time and so much to do. We are a species with amnesia because every generation has to learn it all again. I fear the human race is doomed."

—Samuel, a white man in his 40s from Salem, Oregon

"I am worried for the earth and I want to do something about it but feel like I cannot."

—Kathy, a white woman in her 20s from Spokane, Washington

As these responses suggest, skeptics are worried about environmental disasters and their consequences, which they divorce from climate change. They fear for the future – the future of animals, plant life, and the impacts their loss will have on humans and the Earth itself. While it may seem surprising for climate skeptics to show signs of fear at all—and for context, those who believe climate change is a "hoax" (approximately 25% of our survey sample) often ranked worry and dread at the lowest levels—we did find high levels of worry among those who've had negative firsthand environmental experiences. In our data, worry and dread correlate strongly with environmental concern and policy support.

3.3. Objects of worry and dread

Our interviews and open-ended survey data point to distinct objects of care that elicit worry and dread among climate change skeptics. Generally speaking, dread emerges when people consider existential concerns about human survival or extinction. In contrast, worry is more other-directed and is produced in response to consideration of habitat and nonhuman animal species extinction.

Consider, for example, the dread expressed by participants in our surveys. Sheryl, a white woman in her 20s, believes that God "has a plan" but still feels "dread because sometimes it's evidence [of] how bad these things are." Others do not use the term dread, but their comments suggest they might feel it. For example, Brian, a white man in his 50s, reflects, "It's scary not knowing if I can survive excess heat or cold," while Samuel, cited above, dreads that "the human race is doomed."

Among those who discussed worry, the primary objects of care included nonhuman animal and plant species. Consider Judith, a white woman in her 50s, who quite succinctly indicates: "I worry about our plants and animals." Or take Andrea, an Asian woman younger than 20, who frankly states that she is "worried about the animals going extinct." Our participant Bruce, a white man in his 30s, projects a need for such worry onto others, claiming: "They should be worrying about possible extinction of species."

We are able to deepen this analysis by considering what skeptics say. Barbara, a white woman in her 20s, indicates: "I worry about the world my children and grandchildren will grow up in ... There will be no interesting animals left if people don't stop destroying the planet." In this comment Barbara expresses worry about future generations' diminished experiences as a result of animal species loss. She does not mention any emotions about the potential impact of climate change or environmental degradation on human species as do our participants whom express dread. Among the more nuanced comments are those made by Susan, a white woman in her 20s, who initially says: "when

thinking about habitat loss, I feel a lot of dread.” However, Susan’s dread is seemingly not targeted to habitat loss itself but rather to the impacts of habitat loss on the planet more broadly. She continues: “Nature, as well as the animals in it, are extremely important for a healthy Earth.” Her dread emerges when she thinks about the potential, permanent harm to the planet more broadly.

Overall, our respondents’ comments align with the distinctions we make above between worry and dread. Dread seems to be a deeper, more unsettling fear, one that is “mixed with terror and sadness” about an anticipated future (Albrecht, 2019). Worry, as we’ve been suggesting, tends to target specific objects, such as plant species and nonhuman animal extinction. Anticipating the unknown or invisible is what makes fear so powerful, and both emotions are rooted in uncertainty. A clearer understanding of worry and dread is beneficial because it helps identify and root our fears in real-world problems. While uncertainties about climate change will continue to fuel these emotions, specifying objects of care can be a productive way of articulating what matters and focusing on how to mitigate the impacts of climate change.

3.4. Influence of negative environmental experiences on emotions

Previous literature suggests that negative environmental experiences have an effect on one’s perception of climate change (Giffords and Nilsson, 2014). Therefore, we explored the relationship between negative environmental experiences and emotions regarding climate change. We found that even among skeptics there is a statistically significant relationship between negative environmental experiences and feelings of worry ($b = 0.29, p < 0.001$) and dread ($b = 0.27, p < 0.001$). Negative environmental experiences explain approximately 12% of the variance with regards to worry ($R^2 = 12.4\%, F = 140.74, p < 0.00$) and approximately 10% of the variance in dread ($R^2 = 10.2\%, F = 113.46, p < 0.00$). In other words, knowing that a skeptic has had negative environmental experiences allows us to accurately predict that they would express a higher degree of worry and dread related to climate change (Appendix Table 9).

Our interviews convey the poignancy of negative environmental experiences for the skeptics in our sample. Nancy, a white woman from southern Idaho who believes climate change is a natural occurrence, recalls how her personal experience led to an understanding that pollution is a problem. She says: “My husband used to work in ... an electrical generating plant and that polluted something terrible ... I think that everybody has a responsibility for the Earth because, we all live here and if you don’t get cooperation you are not going to be able to keep the Earth in as good of shape as it is.” Zeke, also from southern Idaho, is a white man who believes that climate change is a natural occurrence. His experiences with pollution led him to care deeply about clean air: “My first wife had asthma and when the air quality in the Boise Valley got bad in the winter she had trouble breathing and when we moved up north and we were in clean air she had a lot better quality of life. The last girlfriend I had had some major heart issues and, during the winter, she had a lot of breathing issues because of that inversion. And I can tell you pollution in the air is a problem...” Negative experience with environmental problems may serve to reduce the “psychological distance of climate change” and that reduction can lead to “fear and avoidance” for those affected (McDonald et al., 2015, 109). Our data suggests something different. For the skeptics in our sample, reducing psychological distance leads to an increase in worry and dread but a heightened sense of responsibility and even agency, the sense that “we can do something” about particular objects of care: in this case, polluted air and the people affected by it.

The impacts of negative environmental experiences on emotions and pro-environmentalism are understudied. However, a review article by Giffords and Nilsson (2014) points to scholarship on the impacts of childhood experiences on environmentalism. For example, Palmer (1993) finds an association between the amount of time spent outdoors as children and environmentalism, while Eagles and Demare (1999)

conclude that people who watch nature shows and read environmental books in their youth have greater concern for environmental issues. Giffords and Nilsson (2014) also review literature that suggests that living close to environmentally destructive locations, such as landfills, increases environmentalism. It seems likely that firsthand experiences with environmental problems would lead to similar results, as is found in our study. Importantly, we also find this to be true of people skeptical about climate change.

3.5. Effects of emotions on pro-environmentalism

To evaluate the influence of worry and dread on beliefs and attitudes, we examined the relationship between emotions and environmental concerns and policy support among skeptics. We find that worry and dread are positively associated with environmental concern such that those who have higher levels of worry ($b = 0.39, p < 0.001$) and dread ($b = 0.33, p < 0.001$) also hold greater concern for environmental issues. In fact, these two emotions explain approximately 21% and 14% of the variance in environmental concern ($R^2 = 20.9\%, F = 264.42, p < 0.00$ (worry) and $R^2 = 14.4\%, F = 167.90, p < 0.00$ (dread)). As such, we can predict with some accuracy that skeptics who express more worry and dread related to climate change will also express more concern for the environment.

With regard to support for pro-environmental policy we find that the more one experiences worry or dread when thinking about climate change, the more likely they are to support pro-environmental policies ($b = 0.29, p < 0.001$ (worry), $b = 0.25, p < 0.001$ (dread)). Worry and dread explain approximately 11% and 8% of the variance in policy support respectively ($R^2 = 11.0\%, F = 123.02, p < 0.00$ (worry) and $R^2 = 7.8\%, F = 84.91, p < 0.00$ (dread)) (Appendix Table 9).

Furthermore, when examining bivariate correlations, we found that worry and dread related to climate change are associated with similar emotions related to pollution and habitat loss, with high levels of statistically significant correlations. Those who are worried about climate change are also worried about pollution ($r = 0.64, p < 0.01$) and habitat loss ($r = 0.63, p < 0.01$). Those who experience dread related to climate change also experience dread related to pollution ($r = 0.64, p < 0.01$) and habitat loss ($r = 0.62, p < 0.01$).

Our qualitative data helps us make sense of these seemingly competing attitudes. In interviews, it became clear that skeptics worried about certain objects of care as they relate to climate change: pollution, habitat destruction, and the people these problems impact. Our participants also shared that these concerns drove them to feel a need for environmental action, yet they did not perceive these problems as connected to climate change.

Savannah, for example, believes climate change is a natural phenomenon that is unimpacted by human activity. However, she does perceive human activity as detrimental to local environments. In particular, Savannah worries about habitat destruction, which drives her to action: “There’s danger in losing certain species of animals, which would be a tragedy in my mind ... I do feel like it is a concern. I would love ... to be able to experience the animals and the different fascinating life forms on this earth without them having to disappear because we are not properly helping the world restore its balance.” Yet, despite overwhelming scientific evidence that climate change, habitat destruction, and pollution are connected, Savannah does not see the phenomena as linked. She argues that even though pollution and habitat destruction are terrible and warrant concern, they are unlikely to cause massive destruction to the planet: “I feel that the world will restore its balance on its own ... But not all the species, not all the animals that we love ... will be available to us if we don’t figure out a different way to help preserve their natural habitats.” While she is not worried about “mother nature” in general, Savannah does feel responsible for addressing the objects of care that concern her. Savannah’s worries about animal habitat and species extinction drive her to feel responsible for environmental protection, even though she does not connect these events or her concern to

climate change more broadly.

Another participant, Jodie, also considers climate change a natural phenomenon that is not worthy of concern; and, like Savannah, she does think that people impact localized environments. Jodie's comments reveal her belief that, while things like pollution and deforestation are bad and worrisome, and that while we have a responsibility to do a better job preventing them, these problems are not connected to climate change. "There is such a thing as pollution. Deforestation is bad. So, I think that we should combat those things ... I do think they're happening, but I think it's a natural progression of the Earth's life." Like Savannah, Jodie feels motivated by her concern to "combat" environmental problems; yet, neither sees these problems as evidence of climate change.

Our qualitative data demonstrates how climate change skeptics disconnect climate change from its associated environmental crises. This disconnect may seem surprising, since previous studies suggest that objects of care "may bridge the psychological distance between the self and climate change, making the issue of climate change seem more personally relevant, evoking stronger emotions, and prompting action" (Wang et al., 2018, 32). Our research suggests that even among people who profess not to believe in human-caused climate change, concern about objects of care can still elicit worry and dread. In other words, the psychological distance between individuals and climate change need not necessarily be bridged in order for people to care about environmental problems and want to address them.

4. Conclusion

Our findings among climate skeptics living in the Pacific Northwest have implications for understanding skepticism more broadly. Even climate skeptics are not immune to worry and dread; indeed, many skeptics care deeply and are concerned about specific problems such as pollution, habitat destruction, and species extinction. Worry and dread seem, even among this unique population, to elicit support for pro-environmental policy. We extrapolate from this population that fear and its emotional variations should not be pathologized as unhealthy barriers to addressing the effects of climate change. Our findings echo recent calls among emotional geography scholars to acknowledge the complexity of our affective lives and to create more opportunities for "open, productive, dialogue ... that might initiate healing, consciousness raising, and political action" (Kemkes and Akerman, 2019).

Our findings also offer important insights for climate communication and environmental policy. Chapman, Lickel, and Markowitz (2017) contend that science communicators and policy makers must engage more effectively with affect in their efforts. They argue that this requires communicators and policymakers to know their audience and develop specially catered messages based on this information. Our research affirms that appeals to worry "can motivate and promote ... the kind of deliberative and iterative decision-making climate change requires" (Smith and Leiserowitz, 2014, 945) and suggests that evoking or surfacing worry among climate skeptics may stimulate their pro-environmental concern and policy support. While such efforts may not change skeptics' perspectives about climate change, it appears that supporting them as they engage with worry and dread increases their likelihood of supporting pro-environmental policies that will serve to mitigate climate change in the long term. Focusing on shared goals such as reducing pollution, preventing deforestation, and investing in renewable energy will benefit the climate and meet the concerns of skeptics.

Sociological approaches to emotions remind us that emotions function within particular political, historical, and cultural contexts, which are fundamentally shaped by power structures. Paying attention to these contexts helps calibrate studies of climate emotions according to specific geographies, demographics, and sociopolitical realities. Our data highlights how climate skeptics' experiences of worry and dread occur within extant structures and cultures, as seen by how these emotions

vary in relation to factors such as gender, political beliefs, and religious beliefs—but not geographic location. In the U.S., fear, helplessness, and guilt are often "compounded by the culture of American individualism" (Norgaard, 2011, 192). Cultural norms of control, limited public expression, and avoidance of politically fraught content often "muffle opportunities for ideas and serious discussion" of climate change (Norgaard, 2011). Americans make too much space for innocence and safety, we compartmentalize our feelings, and we insulate ourselves from feeling cognitive dissonance.

Much like the survey respondent who refused to "let [their] emotions drive [them] insane," many people repress or compartmentalize emotions in unhealthy ways. In addition to understanding how emotions continue to be cordoned off from "rational" knowledge—like "level-headed" David, discussed above—social science researchers should investigate the presence of "affective dissonance," a counterpart to cognitive dissonance that describes "the unsettled state in which we experience more than one feeling at the same time, often with a sense of conflictedness or irony" (Ladino 2019). If people tend to want to resolve cognitive dissonance, and if that need for resolution can contribute to skepticism or denial, then it's worth considering whether affective dissonance functions similarly in regard to climate change perception.

Emotions are not "a lever, where pulling the correct one will produce the desired behavior. There is a level of complexity in emotional responses that cannot be captured without looking in detail at the triggers for these emotions, the objects that cause these emotions to arise" (Wang et al., 2018, 7). More research is needed to explore the variations of fear and the other emotions that climate skeptics—and many others—are feeling. We encourage other scholars to continue the project of investigating climate change emotions from a range of disciplinary perspectives, drawing on unique methodological tools to evaluate the benefits that even so-called negative emotions might afford for mitigating climate change.

Funding details

This project was funded by the University of Idaho CLASS Humanities Excellence Endowment.

IRB approval

This project was approved by the University of Idaho Institutional Review Board.

Declaration of competing interest

The authors declare that they have no known competing interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.emospa.2021.100790>.

References

- Ahmed, S., 2015. *The Cultural Politics of Emotions*, second ed. Routledge, New York.
- Albrecht, G., 2019. *Earth Emotions: New Words for a New World*. Cornell University Press.
- Atkinson, J., 2018. Addressing climate grief makes you a badass, not a snowflake. *High Country News*. May 29, 2018. <https://www.hcn.org/articles/opinion-addressing-climate-grief-makes-you-a-badass-not-a-snowflake>.
- Center for the Study of the Pacific Northwest, 2020. Lesson one: who belongs in the Pacific Northwest. <https://www.washington.edu/uwired/outreach/cspn/Website/Classroom%20Materials/Pacific%20Northwest%20History/Lessons/Lesson%201/1.html> (accessed 04.11.20.).
- Chapman, D.A., Lickel, B., Markowitz, E.M., 2017. Reassessing emotion in climate change communication. *Nat. Clim. Change* 7 (12), 850–852.

- Clayton, S., Manning, C.M., Krygman, K., Speiser, M., 2017. Mental Health and Our Changing Climate: Impacts, Implications, and Guidance. American Psychological Association, and ecoAmerica, Washington, D.C.
- Clayton, S.D., Karazsia, B.T., 2020. Development and validation of a measure of climate change anxiety. *J. Environ. Psychol.* 69, 101434.
- Cunsolo, A., Ellis, N., 2018. Ecological grief as a mental health response to climate change-related loss. *Nat. Clim. Change* 8, 275–281.
- Damasio, A., 1999. *The Feeling of what Happens: Body and Emotion in the Making of Consciousness*. Harcourt, Inc, Orlando.
- Eagles, P., Demare, R., 1999. Factors influencing children's environmental attitudes. *J. Environ. Educ.* 30 (4), 33–37.
- Estok, S., 2018. *The Ecophobia Hypothesis*. Routledge, London.
- Feinberg M., Willer R., 2011. Apocalypse soon? Dire messages reduce belief in global warming by contradicting just-world beliefs. *Psychol. Sci.*, 2011; 22(1):34–38.
- George, L., Ellison, C., Larson, D., 2002. Explaining relationships between religious involvement and health. *Psychol. Inq.* 13, 190–200.
- Giffords, R., Nilsson, A., 2014. Personal and social factors that influence pro-environmental concern and behaviour: a review. *Int. J. Psychol.* 49 (3), 141–157.
- Green, E., 2017. The existential dread of climate change. *Psychol. Today*. October 13, 2017. <https://www.psychologytoday.com/us/blog/there-is-always-another-part/201710/the-existential-dread-climate-change>.
- Haltinner, Kristin, Sarathchandra, Dilshani, 2018. Climate change skepticism as a psychological coping strategy. *Sociol. Compass* 12 (6). <https://doi.org/10.1111/soc4.12586>.
- Hartman, S., Degeorges, P., 2019. “DON'T PANIC”: fear and acceptance in the anthropocene. *ISLE* 26 (2), 456–472.
- Hatemi, P., McDermott, R., Eaves, L., Kendler, K., Neale, M., 2013. Fear as a disposition and an emotional state: a genetic and environmental approach to out-group political preferences. *Am. J. Polit. Sci.* 57 (2), 279–293.
- Head, L., 2016. *Hope and Grief in the Anthropocene: Re-conceptualising Human-Nature Relations*. Routledge, London.
- Jones, J., 2019. Conservatives Greatly Outnumber Liberals in 19 U.S. States. Gallup. <https://news.gallup.com/poll/247016/conservatives-greatly-outnumber-liberals-states.aspx>.
- Kemkes, R.J., Akerman, S., 2019. Contending with the nature of climate change: phenomenological interpretations from northern Wisconsin. *Emot. Space Soc.* 33 (2019).
- Kimmel, M., 2013. *Angry White Men*. Nation Books, New York.
- Klein, E., 2020. Why are liberals more afraid of the coronavirus than conservatives? *Vox*. May 21, 2020. <https://www.vox.com/2020/5/21/21262329/coronavirus-liberals-conservatives-polls-afraid-psychology-distancing>.
- Krause, N., Hayward, R.D., 2012. Emotional expressiveness during worship services and life satisfaction: assessing the influence of race and religious affiliation. *Ment. Health Relig. Cult.* 16, 1–19. <https://doi.org/10.1080/13674676.2012.721349>.
- Ladino, Jennifer, 2019. *Memorials Matter: Emotion, Environment, and Public Memory at American Historical Sites*. University of Nevada Press.
- Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Bergquist, P., Ballew, M., Goldberg, M., Gustafson, A., Wang, X., 2020. *Climate Change in the American Mind*. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.
- Lipka, M., Wormald, B., 2016. How religious is your state? Pew Research Center. February 29, 2016. <https://www.pewresearch.org/fact-tank/2016/02/29/how-religious-is-your-state/?state=washington>.
- Lye, D., Waldron, I., 1997. Attitudes toward cohabitation, family, and gender roles: relationships to values and political ideology. *Socio. Perspect.* 40 (2), 199–225.
- Marlon, J., Howe, P., Mildenberger, M., Leiserowitz, A., Wang, X., 2020. Yale climate opinion maps 2020. In: Yale Program on Climate Change Communication. September 2, 2020. <https://climatecommunication.yale.edu/visualizations-data/yco-m-us/>.
- Marshall, G., 2015. *Don't Even Think about it: Why Our Brains Are Wired to Ignore Climate Change*. Bloomsbury, New York.
- McCright, A., Dunlap, R., 2011. Cool dudes: the denial of climate change among conservative white males in the United States. *Global Environ. Change* 21, 1163–1172.
- McDonald, R., Chai, H., Newell, B., 2015. Personal experience and the 'psychological distance' of climate change: an integrative review. *J. Environ. Psychol.* 44, 109–118.
- Newheiser, A., Farias, M., Tausch, N., 2011. The functional nature of conspiracy beliefs. *Pers. Individ. Differ.* 51, 1007–1011.
- Ngai, S., 2005. *Ugly Feelings*. Harvard University Press, Cambridge, MA.
- Norgaard, K., 2011. *Living in Denial: Climate Change, Emotions, and Everyday Life*. MIT Press, Cambridge, MA.
- O'Neil, S., Nicholson-Cole, S., 2009. “Fear won't do it: promoting positive engagement with climate change through visual and iconic representations. *Sci. Commun.* 30 (3), 355–379.
- Palmer, J., 1993. Development of concern for the environment and formative experiences of educators. *J. Environ. Educ.* 24 (3), 26–30.
- Pedersen, W., Muftuler, L., Larson, C., 2018. Conservatism and the neural circuitry of threat: economic conservatism predicts greater amygdala-BNST connectivity during periods of threat vs safety. *Soc. Cognit. Affect Neurosci.* 13 (1), 43–51.
- Pihkala, P., 2020. Anxiety and the ecological crisis: an analysis of eco-anxiety and climate anxiety. *Sustainability* 12.
- Ray, S., 2020. *A Field Guide to Climate Anxiety: How to Keep Your Cool on a Warming Planet*. University of California Press, Berkeley.
- Rayson, A., Deborah, S., 2019. Ecophobia, reverential eco-fear, and indigenous worldviews. *ISLE* 26 (2), 422–429.
- Ring, W., 2015. Inspire hope, not fear: communicating effectively about climate change and health. *Ann. Global Health* 81 (3), 410–415.
- Roeser, S., 2012. Risk communication, public engagement, and climate change: a role for emotions. *Risk Anal.* 32 (6), 1033–1040.
- Slovic, P., Finucane, M., Peters, E., MacGregor, D.G., 2002. Heuristics and biases: the affect heuristic.
- Slovic, S., Slovic, P. (Eds.), 2015. *Numbers and Nerves: Information, Emotion, and Meaning in a World of Data*. Oregon State University Press, Corvallis.
- Smith, N., Leiserowitz, A., 2014. The role of emotion in global warming policy support and opposition. *Risk Anal.* 34 (5), 937–948.
- Sobel, D., 2007. Climate change meets ecophobia. *Connect* 14–21.
- Stoknes, P., 2015. *What We Think about when We Try Not to Think about Global Warming: toward a New Psychology of Climate Action*. Chelsea Green, Hartford, VT.
- Sullivan, D., Landau, M., Rothschild, Z., 2010. An existential function of enmity: evidence that people attribute influence to personal and political enemies to compensate for threats to control. *J. Pers. Soc. Psychol.* 98, 434–449.
- Wallace-Wells, D., 2019. *The Uninhabitable Earth*. Tim Duggan Books, New York.
- Wang, S., Leviston, Z., Hurlstone, M., Lawrence, C., Walker, I., 2018. Emotions predict policy support: why it matters how people feel about climate change. *Global Environ. Change* 50, 25–40.
- Weston, D., 2008. *The Political Brain*. Public Affairs, New York.
- Zinnbauer, B., Pargament, K., 2005. Religiousness and spirituality. In: Raymond Paloutzian and Crystal Park (Ed.), *Handbook of the Psychology of Religion and Spirituality*. Guilford Press, New York, pp. 21–42.

Dr. Kristin Haltinner is an associate professor of sociology at the University of Idaho. Haltinner is a political sociologist and studies perceptions of climate change, right-wing ideology, racial formation and discourse, social inequality, and critical pedagogy. Her recent projects focus on the TEA Party Patriots, climate change skepticism, and nativist militias.

Dr. Jennifer K. Ladino is a professor of English at the University of Idaho and the author of *Memorials Matter: Emotion, Environment, and Public Memory at American Historical Sites* (2019) and *Reclaiming Nostalgia: Longing for Nature in American Literature* (2012). She co-edited, with Kyle Bladow, *Affective Ecocriticism: Emotion, Embodiment, Environment* (2018), and has published articles on a range of subjects in the environmental humanities.

Dr. Dilshani Sarathchandra is an associate professor of sociology at the University of Idaho. She works primarily in sociology of science, knowledge and technology. Her research focuses on decision-making processes in science, predictors of public attitudes toward science and technology, and social dimensions of health.