Summary and Keywords

People can take extraordinary measures to protect that which they view as sacred. They may refuse financial gain, engage in bloody, inter-generational conflicts, mount hunger strikes and even sacrifice their lives. These behaviors have led researchers to propose that religious values shape our identities and give purpose to our lives in a way that secular incentives cannot. However, despite the fact that many cultural and religious frameworks already emphasize sacred aspects of our natural world, applying all of that motivating power of "the sacred" to environmental protectionism seems to be less straightforward.

Sacred elements in nature do lead people to become committed to environmental causes, particularly when religious identities emphasize conceptualization of humans as caretakers of this planet. In other cases, however, it is precisely the sacred aspect of nature which precludes environmental action and leads to the denial of climate change. This denial can take many forms, from an outright refusal of the premise of climate change to a divine confirmation of eschatological beliefs.

A resolution might require rethinking the framework that religion provides in shaping human-environment interactions. Functionalist perspectives emphasize religion's ability to help people cope with loss—of life, property and health, which will become more frequent as storms intensify and weather patterns become more unpredictable. It is uncertain whether religious identity can facilitate the acceptance of anthropogenic climate change, but perhaps it can aid with how people adapt to its inevitable effects.

Keywords: religion, spirituality, environmental attitudes, climate change, culture

Nature is an integral component in many religious doctrines. It often plays a symbolic role, alongside a pragmatic one, a means to experience the divine as well as survive in an often harsh environment. For instance, in Islam, a faith that evolved under conditions of severe water scarcity, the holy text offers many prescriptions of water usage and conservation. Water is viewed both as a physical purifier and a moral one (Benessaiah, 2011; Gilli, 2004). Similarly in Hinduism, cremation ceremonies specify what type and how much wood is to be used depending on properties of one's life (Carpenter, 1986; Davis,

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1988). Religion also provides explanations as to how the world was created, why, what humans' role is within it and maybe even when natural disasters occur (Pierotti & Wildcat, 2000; Spilka, Shaver, & Kirkpatrick, 1985). It has even been proposed that religion serves to bridge humans to their environment by using rituals to mark the rhythm of seasonal changes, expressing gratitude for bountiful harvests and praying to keep away destructive natural forces (Tucker & Grim, 2001). There are variations in the degree and type of human-nature relationships but there are few religious traditions that are not shaped by the natural landscape in which they originate.

This review illustrates that beliefs about human-nature relationships, religious cosmologies and perceptions of climate change are a set of interrelated concepts, reinforced and shaped by one another. Religious perspectives affect how humans see their place in the environment but environmental features shape religious perspectives as well. We hope that the themes and issues highlighted here will be of particular use to natural resource managers, as they engage with local communities, in bridging societal and communication barriers. Environmental practitioners are often trained within a scientific system which places humans as observers or managers of nature, rather than as components within a complex and inter-related socio-ecological system (Alberti et al., 2003; Atran & Medin, 2008; Grimm, Grove, Pickett, & Redman, 2000; Medin & Atran, 2004; Tress, Tress, Décamps, & d'Hauteserre, 2001; Woodley & Kay, 1993). This perspective might not align well with some eco-theologies which may emphasize the inseparability of religious, spiritual and ecological knowledge (Pandya, 2014; Pierotti & Wildcat, 2000). Religions have often emphasized the utilitarian aspect of nature (e.g. medicinal herbs, valuing species for their milk) but this form of consumption is nonetheless imbued with spiritual meaning. In certain contexts, mainstream, scientifically-based principles of ecological conservation might be at odds with traditional consumption of natural resources, particularly when that consumption is based on religious practices (Farrell, 2015). In the simplest terms, secular and sacred strategies of environmental management and conservation might not agree on what is "natural" or "good."

Our aim in this review is to illustrate how religious beliefs, worldviews, and orientations can impact conceptions of humans' role in the natural world. Though the interrelation between these constructs can be approached from many perspectives (e.g., theological, sociological, anthropological), this review will rely primarily on the theoretical and empirical literature from psychology. We will also highlight different forms that eco-theological relationships can take across the many religions in the world, from those based in Judeo-Christian theology to religions such as Hinduism and Buddhism, prevalent in many Asian countries, and also the spiritual beliefs that shape ecological reasoning in many indigenous cultures. Recognition of eco-theological diversity has important implications for climate change policy, as strategies that are successful within one religious and cultural context may not perform as well as others. We start with a brief look at how psychologists have conceptualized the role religions play in shaping human thought.

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Religion in the Human Mind

The study of religious influence on the human mind has been a core topic since the inception of empirical psychology as a field of study (James, 1985; Johnson, 1959; Jung & Sabini, 2002). Psychologists have demonstrated the profound ways in which religion can shape one's perception of the world and form the most foundational aspects of our identity, including attitudes, beliefs and preferences (Emmons & Paloutzian, 2003). In the past three decades, this work has taken on new purpose as scientists begin to realize that religion is among the most powerful of all social forces (Green, 1996; McGuire, 2008). It is not, as has been assumed at times, constrained to personal values but rather forms a worldview that can shape almost every aspect of everyday life, provide people with ultimate goals and the means of achieving them (Geertz, 1966). Religion is also a powerful social binder, creating and maintaining group identity (Lim & Putnam, 2010; Ysseldyk, Matheson, & Anisman, 2010). It can spur (or justify) inter-group conflict (Atran & Ginges, 2012) but also foster passionate commitment to social causes (Smith, 2014; Stark & Bainbridge, 1980). Clinical and cognitive psychologists have independently noted that religion plays an adaptive role in the human mind and society, helping people cope with uncertainty, loss, providing hope and sustaining communities (Norenzayan, 2010; Pargament, 2001).

It is also worth noting that much work has also explored the commonly made distinction between religiosity and spirituality. The latter is thought to be a mostly phenomenological experience while the former is commonly defined as a set of practices and beliefs built on the idea of a higher being, and on attaining sacred experiences through structured rituals. Spirituality is centered on personal experiences while religious experiences generally occur in a social setting. Spirituality can imbue everyday experiences with sacred qualities, i.e. spending time with one's child, solving a difficult problem, etc. and, unlike religiosity, does not require a formalized context. There remains some fluidity in these definitions, and it appears that people who experience religiosity also experience spirituality and vice versa, as both ultimately result from the pursuit of the sacred (Emmons & Paloutzian, 2003; Hill et al., 2000; Zinnbauer et al., 1997). Therefore, this review will remain agnostic as to the particular phenomenological experience of the sacred and allow for overlap between these terms.

Human-Environment Interactions: An Overview

The capacity for religious thought appears to be deep-rooted in the human mind. Eliade and others have even referred to our species as *Homo religiosus* to mark this core feature of human cognition (Eliade, 1968; Hamilton, 1965). Unfortunately, *Homo environmentalus* is a label few, if any, have bestowed on our species. Humans as a species, with notable exceptions (Delcourt & Delcourt, 2004), have a checkered environmental record. For instance, as early as 50,000 years ago, humans had already become primary factors in the extinction of some species (Miller et al., 2016). However, the capacity for humans to impact natural ecological cycles has increased dramatically in last 300 years, the era of the

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Anthropocene, as industrialization and population growth accelerate. These factors have resulted in exponential increases in greenhouse gas emissions, overconsumption of natural resources and other forms of ecological disruption.

Despite these detrimental environmental effects, humans do feel instinctively drawn to the natural world (Wilson, 1984). Even the most minimal access to green space has been shown to expedite healing in hospital patients, help children learn more effectively in schools, increase productivity in the workplace and help people find mental solace overall (Lee & Maheswaran, 2011; Vries, Verheij, Groenewegen, & Spreeuwenberg, 2003; Wu et al., 2014). People report feeling at peace when immersed in nature and often report a sense of being part of something larger (R. Kaplan, 2001; S. Kaplan, 1995). The restorative effects of natural green spaces are well documented, why, then, do significant numbers of the human population, in the United States and globally, seem to worry so little about the future health of the environment (Gallup Inc, 2015; Stokes, Wike, & Carle, 2015).

Psychologists have identified a number of barriers to engaging in environmental action that fall broadly within the umbrella terms of uncertainty, apathy and disengagement (Gifford, 2011). However, they have also mapped certain motivational factors that may help promote pro-environmental behaviors (or at the very least environmentally-neutral ones). Traditionally, these have focused on the role of environmental values and stewardship attitudes, such as ecological concern, desire to protect nature, self-nature identity overlap or personal efficacy in yielding pro-environmental outcomes (Karp, 1996; Kellstedt, Zahran, & Vedlitz, 2008; Mayer & Frantz, 2004; Schultz et al., 2005). Moral motivations, i.e. believing that nature is something that has to be prevented from harm, have gained traction in the field as efficacious pathways to environmental engagement (Feinberg & Willer, 2013; Markowitz & Shariff, 2012). The somewhat related idea of environmental stewardship has also become influential in recent decades, from both a resource manager and consumer perspective, with more people feeling a sense of responsibility towards other species and maintaining shared natural resources (Worrell & Appleby, 2000). The influence of religious worldviews on each of these individual-level factors seems non-trivial as religious belief certainly affects moral thought, as well as perceptions of one's agentic influence in the world (Bloom, 2012; Jackson & Coursey, 1988; Seul, 1999).

The psychological literature on human-environment interactions has also shown robust effect of social norms and peer-to-peer communication in eliciting pro-environment behavior, whether in the form of energy curtailment or promoting green consumer choices (Cialdini, Reno, & Kallgren, 1990; Goldstein, Cialdini, & Griskevicius, 2008; Sachdeva, Jordan, & Mazar, 2015). Formalized and tight-knit religious communities are, again, well-suited to adopt and propagate norms that promote these environmentally beneficial choices. Religious organizations and other community groups are well-positioned to adopt new energy-efficient technologies and curtailment behaviors, which may then be more easily disseminated to its members. As with the civil rights movement in the 1960s, reli-

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gious groups have the ability to serve as central hubs, instigating transformational change in a broad network.

As the remainder of this review will illustrate, many religious groups have taken steps to galvanize their members and become more engaged with the natural world but there remain others who view their identities as unrelated or incompatible with these issues. This review will examine the structure of religious identity as it impacts environmental engagement. This engagement can take many forms, such as environmental stewardship, sustainability for future generations, mutual dependence between humans and their land, or viewing the earth and its vital resources as a sacred gift. Each of these forms may have distinct and significant implications for environmental outcomes, and may shape our shared future in the decades to come.

Western Religion—Pathways to Ecological Concern

The psychological exploration of the theological underpinnings of ecological concern grew out of the assumption that certain religions were more likely to promote environmental action than others. This perspective has long since been understood as being overly simplistic and subject to multitudinous contextual, cultural, sociological and historical effects. This section begins with an example from one of the early approaches (i.e. relationship between particular religions and lack of ecological concern) and portrays the evolution in viewing religion as a mosaic of psychological influences on the human-nature relationship.

The Lynn White Thesis

One of the most seminal pieces on the relationship between certain theologies and environmental thought is Lynn White's 1967 essay in which he posits that Judeo-Christian theologies must bear the burden, in part, of our modern environmental degradation. These theologies, he claims, possessed unique origin narratives which sharply delineated between humans and nature, giving the former dominion over the latter. The orientation of "man as master," divorced from the environment allowed modern agriculture and goods production to flourish, but in what has been shown to be, an unsustainable way. White (1967) called for an abandonment of traditional Judeo-Christian values and their consequent cultural perspectives on the role of nature as servicing the needs of humankind, and reformulating it by viewing nature and humans as equal and interconnected.

Dominion Framework

The White perspective is based on the idea that Judeo-Christian doctrines, particularly those found in the book of Genesis, are synonymous with a "mastery over nature" orientation. There is some empirical support for this proposition. In testing the White hypothesis, Hand and Van Liere (1984) found that Judeo-Christians are more likely than others to

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advocate humans control over nature and tend to have lower levels of environmental concern. They also found that those members of more conservative denominations are more likely to have a dominion framework.

However, this perspective on Judeo-Christian teleology of nature has also been contested in the decades since the original White thesis was published. While ecumenical literature has focused on the precise translations and interpretations of words like "dominion," social scientists have countered the White thesis by suggesting that Judeo-Christian religiosity is itself a multi-faceted mosaic of experiences (Djupe & Hunt, 2009; Riley, 2014). Not only does it contain different denominations, sects and interpretations of religious doctrines, but within each of these sub-groups exist individual-level variations in factors such as spiritual engagement, formal affiliation, ceremony attendance and scriptural knowledge. Therefore, it is a somewhat simplistic claim that a mastery or dominion orientation to nature is ubiquitous in adherents of Judeo-Christian principles (Woodrum & Hoban, 1994). Rather, this orientation can be thought of as one component of religiosity (perhaps one that is negatively correlated with environmental concern), but there may be others, such as believing nature to be intrinsically sacred, which show a positive correlation with environmental conservation (Tarakeshwar, Swank, Pargament, & Mahoney, 2001). Judeo-Christian beliefs may also give rise to a stewardship or human-as-caretaker models of nature which may promote environmental concern (Baylor & Brandhorst, 2015; Shaiko, 1987).

Congregational Effects of Judeo-Christian Worldviews

Another important function of religious affiliation is that it becomes a crucial communication network in people's lives, where two types of information dispersion processes are at play: 1) top-down processes from clergy or other sources of expert information as it pertains to religious issues and 2) peer-to-peer communication that may help create and sustain social norms (Djupe & Hunt, 2009; Schwadel, 2005). Therefore, the cultural mores of any particular religious congregation, which result from interactions between these two levels of communication, may have more to do with the relationship between religious affiliation and environmental beliefs and behaviors than the scripture or doctrine of any particular religion, as postulated by the White thesis. In other words, being deeply involved with a religions is often as much a social process as it is a cognitive process, and, therefore, the meaning of being religious changes over time as group norms evolve (Converse, 1964; Djupe & Hunt, 2009; Eckberg & Blocker, 1996). Congregations which have an environmentally engaged minister, one who emphasizes the consequences of environmental degradation, might consist of more environmentally concerned members (Truelove & Joireman, 2009; Veldman, Szasz, & Haluza-DeLay, 2014). Viewing religious membership as a continually evolving process allows for flexibility and variation in environmental engagement.

This perspective on religion can explain, to some extent, the mixed nature of findings which have attempted to validate the Lynn White thesis. Although a number of studies have found support for Judeo-Christian beliefs as suppressing environmental concern,

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there are a large number of others which have found no effect (Koehrsen, 2015), or found that certain Christian orientations, such as the idea of humans as stewards of a God-created environment can even promote pro-environmental action (Chuvieco, 2012). An internal poll by the National Association of Evangelicals, an organization representing about 40,000 churches in the United States, showed that 96% of Evangelical leaders supported government action to ensure clean air and water (NAE, 2015). One leader, in particular, noted: "We neither idolize God's creation, nor utilize it irresponsibly, but we steward it and study it to discover more of God[1]." The Catholic Church's recent Climate encyclical was another significant step in this direction, making the Earth's ecological health not only a salient topic in the public sphere but also a matter of social justice (Francis, 2015). So, while a dominion framework might, in fact, be problematic for environmental consequences, adhering to Judeo-Christian beliefs does not equate to believing humans have mastery over nature (Hand & Van Liere, 1984).

Eschatological Beliefs

In addition to promoting a dominion framework of human-environment interaction, it has been proposed that Christian eschatological beliefs also pose a problem for promoting ecological concern. Some propose that the ongoing destruction of the environment must signify the Second Coming, after which earthly concerns should have no relevance for the true believers (Lindsey & Carlson, 1970; Rock, 2011). This perspective, once again, claims that adherence to Judeo-Christian beliefs reifies the distinction between humans and the natural environment, by setting the Earth as simply one step on a road to eternal life (Phan, 1996). Studies, such as Guth et al's. (1995) work, find that conservative eschatological beliefs show a strong inverse relationship with environmentalism, controlling for other aspects of religiosity and ideology, a noteworthy finding in light of survey results showing that 41% of the American public believe the Second Coming will occur by 2050 (Pew Research Center, 2010). It appears likely that the influence of eschatological beliefs on environmental concern interacts with religious literalism, yet these results are still suggestive in showing that a shortened temporal horizon of the fate of the world may reduce environmental concern.

One empirical explanation of why eschatological beliefs inhibit environmental concern is that end-of-time believers prefer shorter-term over longer-term consumption due to a shortened time horizon. This increased temporal discounting of environmental resources may lead to an unwillingness to support policies that aim to manage outcomes hundreds of years in the future (Barker & Bearce, 2013; Hendrickx & Nicolaij, 2004). Another, which has yet to be empirically tested, is that it is not *religious* eschatology per se which inhibits ecological concern, but rather the despair which accompanies a focus on the end of the world as we know it. A secularist eschatology which stresses the inevitability or irreparability of environmental deterioration may not only foster similar apathy but, unlike religious end-of-times thinking, cause despair with no means of assuaging it (Simkins, 2008). Hope, as Ojala (2012) has shown, in a sustainable future, may be a strong factor in people's decision to become environmentally engaged.

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Non-Judeo-Christian Religions and the Human-Nature Relationship

As mentioned at the outset, the goal of this review is not to enumerate the extent to which religious theologies are interwoven with ecological sustainability objectives. However, the Lynn White thesis implicates a particular theology in the current environmental crisis while acquitting others. We thus turn to those non-western religious perspectives which have been supposed to foster conceptions of harmony in human-nature relationships.

Human-Nature Connectedness

Most Eastern religions, particularly Buddhism, Hinduism, Jainism, and Taoism, are thought to emphasize the connection between humans and their natural environments. In each of these religion's doctrines and traditions, scholars have noted themes of human-nature interdependence and interconnectedness. In Buddhism, for example, humans and other living beings are united in the suffering they face and the choices they make (Swearer, 2001). Hinduism and Jainism create an explicit connection between humans and all other living things through the concepts of *karma* and reincarnation, with every living thing obliged to abide by its own set of duties through the course of its life (Chapple, 2001, 2006). Taoist and Confucian traditions suggest that all things on the Earth are tied by cosmic energy, and that, "stones, plants and animals" all evolve through the same vital forces (Jenkins, 2002; Weiming, 2001). Similarly, the interconnectedness between humans and the natural world is a core feature of American Indian cultural identity, rejecting the notion that humans can be isolated from the rest of the animate or inanimate world (Deloria, 2003; Lewis, 1995; Pierotti & Wildcat, 2000).

Each of these religious traditions also view particular aspects of the natural world as sacred objects, whether that means revering certain trees for their connection to the Buddha's journey to *nirvana* (Sponsel & Natadecha-Sponsel, 2003) or, as in indigenous religious traditions in Tibet and Shintoism in Japan, sanctifying mountains and forests as abodes of deities (Breen & Teeuwen, 2013; Byg & Salick, 2009; Xu et al., 2005). Similarly, Hindu traditions revere trees, like the Banyan, as symbols of eternal life. Rivers, such as the Ganges and the Yamuna, are also prized for their purity and divine properties (Haberman, 2006; Singh, 1974). While nature worship is unusual in Judeo-Christian traditions, it is a common and well-accepted way to connect with the divine within the Eastern religions.

Implications for Environmental Conservation

While some cultures and religions may emphasize the connection between humans and nature, this may not always translate into environmental conservation. The Ganges and the Yamuna are two of the most polluted rivers in the world, despite being life channels for tens of millions of people (Alley, 1994; Haberman, 2006). Narayanan (2001) notes the

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inherent irony by referring to these rivers as "physically polluted moral purifiers." Even as studies continue to document the dangerous level of contaminants in the Ganges, millions of pilgrims flock to the river to take a ceremonial, cleansing dip in its sacred waters. In the same vein, scholars have noted the apparent paradox between the value of nature in Shintoism with the rampant destruction of wildlife in Japan (Kellert, 1991). Over-irrigation and overconsumption of groundwater resources in India have made that country more susceptible to drought and water resource conflict than any other in the world (Birkenholtz, 2008). China too is facing similar problems, with its air pollution levels consistently rated some of the worst in the world while deforestation is rampant to clear land for agricultural use (Chan & Yao, 2008; Laurance, 1999). In other words, environmental degradation can be just as prevalent in countries where the majority of the population affiliates with Eastern religions as in countries that are predominantly Christian (Gardner & Stern, 2002).

These macro-level trends may not tell the full story, as there are conservation efforts in most countries noted above, and some of these efforts are rooted in traditional, religious beliefs. As one example, the Dai people, an indigenous group in southwest China, have syncretistic religious beliefs with Buddhist and polytheistic elements. They have resided in the proximity of "holy hill forests" for generations, which are considered residences of the gods and impart a protected status on all plants and animals who live in these forests. Liu and colleagues (2002) compared the species level biodiversity within these forests and found that diversity in the traditionally maintained forests was much greater and consisted of more protected species than were found even in the national forests, which are strictly regulated. Sacred groves, found all over India, show similar patterns, maintaining biodiversity, cultivating medicinal plants and preserving rare species which have become extinct in other parts of the country (Gadgil & Vartak, 1976; Lebbie & Guries, 1995; Ormsby & Bhagwat, 2010).

While these traditional religious practices of maintaining sacred groves and forests have been effective over many generations (Kandari, Bisht, Bhardwaj, & Thakur, 2014; Mgumia & Oba, 2003), there remains a question of why these conservation practices are not reflected in the overall environmental records of countries like India and China. In other words, countries where the dominant religions emphasize human-nature connectedness have similar levels of environmental degradation. Fundamental structural factors such as accelerating population growth and urban expansion are certainly increasing resource demands. An emerging middle class that desires consumer advantages of the West may also increase greenhouse emissions through increased industrial production and goods transportation. Additionally, Gardner and Stern (2002) identify an "override phenomenon" in some societies whereby political, military and economic factors overwhelm religious and moral teachings in a culture. For instance, in the case of the Ganges river, over 90% of the pollution can be attributed to industrial and municipal wastewater, not the ritualistic practices of millions of pilgrims that visit its shores every year (Trivedi, 2010). So, while religious teachings on human-nature connectedness are not in themselves a guar-

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antee of environmental conservation behavior, it is possible that positive ecological impact of these teachings may be superseded by some political, social and economic factors.

Tomalin (2004) proposes another intriguing explanation of the apparent incongruity between human-nature epistemologies and conservation behavior in Eastern religious traditions. She posits that environmental conservation is itself a Western concept which may not align well with traditional ecological practices such as tree worshipping or purification rituals. She distinguishes between "bio-divinity" and "religious environmentalism." The former describes the practice of imbuing parts of the natural world with sacred status while the latter refers to environmental action motivated by religious doctrine. In developing countries such as India, there is a constant tug of war between viewing nature as sacred and a necessity to use those resources in the face of alarming poverty (Tomalin, 2002). Environmentalist appeals of the sanctity of the earth are not likely to be effective in this context, even if they draw on traditional teachings. Tomalin (2004) states, "It is important to realise that religious environmentalism offers an *interpretation of tradition* and not a *traditional interpretation* (p.272)." In other words, an emphasis on human-nature connectedness in certain religious beliefs may be more of an ontological point rather than a precursor of environmental conservation.

These observations suggest that whether a religious theology is congruent with ecocentrism may be less important than whether religious principles are actually employed in designing effective and far-reaching environmental policies. Any religious belief, whether Christian, Islamic, Hindu, Buddhist or Taoist, might have components that promote environmental stewardship, by evolving in an ecological system and shaped by the natural environment. Each religion's norms, taboos, and canons must, in some part, be a reflection of available natural resources and necessary environmental constraints (Harris, 1968). However, to be useful on a practical level, policy makers could be well-served by appreciating the nuances and complexity inherent in religious values for motivating environmental action (Byers, Cunliffe, & Hudak, 2001). In addition, cultural values and norms are continuously evolving as populations migrate, environmental conditions change and people continue to pursue happiness. It is important to keep in mind that these forces may be powerful enough to overcome any small-scale, community-based religious practices that have traditionally yielded positive environmental outcomes.

Climate Change

In this review, so far, we have been discussing environmental beliefs and ecological concern in general terms, here we will address climate change specifically. According to the IPCC, the changing global climate is the most urgent environmental issue of our times (IPCC, 2014). However, it is also one of the most contentious ones in the United States—seeming more often a political rather than an environmental issue. Most Americans, about 71% (Gallup Inc, 2014B; Leiserowitz, 2007; Leiserowitz et al., 2014), accept that climate change is real (even higher when it is referred to as global warming) but many fewer worry about its social, economic or health consequences (ranging from 17 to 49%)

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or believe that it has anthropogenic causes (50 to 57%). In addition, climate change or global warming remains close to the bottom of most Americans' list of worries, below the state of the Social Security System and the possibility of terrorist attacks (Gallup Inc, 2014A). Other environmental issues, which are seemingly related to climate change, such as the affordability of energy, concern for clean air and water, and extinction of plant and animal species are rated as more worrisome than climate change as a construct on its own (Gallup Inc, 2015). Furthermore, although the level of climate change acceptance has remained stable over the past couple decades, the degree of political polarization in those attitudes has dramatically increased. A difference of about 10–15 percentage points, depending on the question, was observed between self-identified liberals and conservatives in the early 2000s, while in 2010 there was a difference of about 40–50 percentage points (McCright & Dunlap, 2011). Some scholars estimate that it was around the time of the Kyoto Protocol negotiations in 1997, followed by the Al Gore presidential campaign of 2000, which led to the politicization of the term "climate change," and transformed the issue from a primarily environmental one to one that was diagnostic of one's political and moral affiliations (Leiserowitz, 2005; Leiserowitz, 2006; Smith & Leiserowitz, 2012).

Western Religious Perspectives

Religious affiliation and participation appear to play as strong a role in shaping Americans' views on climate change as it does with other environmental issues. Researchers at Yale's Program on Climate Change Communication have developed the "Six Americas Framework" for segmenting Americans' attitudes on climate change into six categories from "Alarmed" (12% of Americans), people who attribute the changing climate to human causes and believe its consequences will be dire, to "Dismissive" (11% of Americans), people who are certain that climate change is not happening and might even think of the concept as a political hoax perpetrated on the public (Roser-Renouf, Maibach, Leiserowitz, Feinberg, & Rosenthal, 2016). These attitudes appear to vary systematically by religious affiliation and by the frequency of attending religious services. There are more self-identified Agnostics or Atheists in the "alarmed" or "concerned" categories (up to 21%) than in the "doubtful" or "dismissive" categories (up to 6%) compared to a nationwide average of 8%. Similarly, Protestants and Baptists, identified as 29% of the nationwide sample, are underrepresented in the "alarmed" category (15%) and over represented in the "dismissive" category (36%) (Roser-Renouf et al., 2016).

While these results are suggestive, they are correlational in nature and thus do not provide explanations about *why* (or if) adherence to particular Christian faiths might be inimical to climate change acceptance. A higher external locus of control, or decreased personal responsibility, in maintaining ecological health might be one factor that explains some Christians' skepticism of climate change and hesitation in support mitigating policies. Previous research has demonstrated that people who see themselves as having control over their lives and a strong sense of personal efficacy in reaching environmental and social goals are more likely to engage in pro-environmental behavior (Antonetti & Maklan, 2014; Engqvist Jonsson & Nilsson, 2014). However, Christian participants in some

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studies were more likely to believe in God as an intervening agent (consequently reducing personal agency), which in turn predicted climate change skepticism (Degelman & Lynn, 1995; Mostafa, 2015; Shin, 2015).

Evangelical Christians, in particular, appear to have a complex relationship with climate change belief and action. They are generally overrepresented in groups which either unequivocally deny the existence of climate change or disbelieve its anthropogenic roots (45% of "dismissives" identify as Evangelical) (Roser-Renouf et al., 2016). As this group forms an important voting bloc, with up to 30% of the American population, they can potentially have a strong influence on the policy level (McCammack, 2007). Therefore, it is especially important to understand aspects of Evangelical theologies which may hinder or promote the belief in climate change.

Some of the aspects of Judeo-Christian faith that lead to a "humans apart from nature" model may also apply to climate change beliefs (e.g. eschatological beliefs, dominion orientation, biblical literalism, etc.). However, Evangelical Christians' belief in the fallibility and inherent sinfulness of humans might be an important additional factor to consider. Indepth qualitative interviews with Evangelical Christian participants revealed that a substantial sub-group of pastors and lay church members believe that environmental degradation is a seemingly inevitable consequence of humans' great aptitude for sinning (Carr, Patterson, Yung & Spencer, 2012). Interestingly, this perspective does not preclude the existence of climate change, nor its anthropogenic roots, because this sub-group of respondents do believe that it is humans' sinful action that causes environmental degradation. Carr et al. (2012) also note that this perspective also deviates from other evangelical beliefs on what should be done to mitigate the consequences of climate change. For this sub-group of Evangelical participants, the same perception of human fallibility, seen as responsible for environmental damage in the first place, also implies that humans must take some responsibility in restoring it. Although God's sovereignty alone can be thought to have ultimate control over any environmental degradation and its possible consequences, this sub-group, more so than groups with a primarily dominion orientation or belief in the Second Coming, appears to be most willing to engage in climate change action.

In addition, the social justice aspects of climate change might also be well-aligned with the Christian duty to help the poor and needy (Prelli & Winters, 2009). Climate change is certainly an environmental problem but also has a disproportionate effect on the poor, in developing countries and countries which have little global power (Adger, 2006; Brown, 2001; Thomas & Twyman, 2005). In 2006, a group of 86 evangelical leaders in the United States emphasized the social component of climate change in the "Evangelical Call to Action" (ECI, 2006). This document states that climate change is one of the most pressing issues facing the world today and calls for more stringent controls on carbon emissions. The main impetus of the "Call to Action" is that climate change will affect poorest countries the most, by reducing agricultural output, potentially creating violent conflicts as resources become scarcer and increasing rates of tropical diseases in temperate regions. The Climate Change Encyclical issued by the Catholic church uses similar reasoning to

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urge action (Francis, 2015). It notes that the world's poor are more likely to rely on natural resources for subsistence, and they have fewer social services to rely on in the face of increasingly more severe natural disasters. It goes one step further by decrying a consumerist culture promoted by the rich:

The warming caused by huge consumption on the part of some rich countries has repercussions on the poorest areas of the world, especially Africa, where a rise in temperature, together with drought, has proved devastating for farming.

A promising line of research would be to assess whether a social developmental rather than an environmental framing of climate change will have a greater motivational impact on skeptics within Judeo-Christian faiths on mitigation action.

Eastern and Indigenous Religious Perspectives

Though there has been a substantial amount of discourse on the influence of Christian beliefs on climate change perception, significantly less literature is available, of either a theological or social scientific sort, to describe the impact of Eastern religious doctrine on climate change perception. Although, religious affiliation appears to play less of a role in directing climate change policy in non-Western societies than it does in the United States (Capstick, Whitmarsh, Poortinga, Pidgeon, & Upham, 2015) these perspectives are still important in understanding the diversity of frames of climate change communication, and how people conceptualize ecological change. The perspective of indigenous religious traditions become even more important when one considers that these groups are more likely to suffer, and in fact, already are suffering the consequences of rising sea levels, severe droughts, floods, and ensuing forced migration (Aminzadeh, 2006; Bronen, 2010; Piguet, 2008). In addition to the physical suffering of natural disasters, indigenous people face pain on a spiritual front, as their sacred places and species are damaged (Lewis, 1995). Studies with populations living in the proximity of the Himalayas show widespread recognition of local climate change. Chaudhary and Bawa (2011) find that of 250 households interviewed in India and Nepal, significant majorities believe that average temperatures are warming (73.2%) and seasonal onset of rain have advanced (67.2%). These beliefs in changing seasons and increased scarcity of water resources are validated by scientific observations in the region.

What are the religious influences on these perceptions of climate change? There is some evidence that the religious beliefs that are more prevalent in this region, i.e. Buddhism and Hinduism, may lead to greater acceptance of climate change. For instance, extending the Six Americas Framework on perceptions of global warming and climate change, Morrison, Duncan, and Parton (2015) assessed the difference between Buddhist and Christian participants in Australia on perceptions of climate change. They found that Buddhist participants were more likely to accept that climate change was occurring than Christian participants. They were also more likely to attribute ecological changes to human causes and believe that there is a robust consensus in the scientific community about the causes and effects of climate change. Buddhist participants' views were similar to secular partic-

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ipants in most regards except for two intriguing points of divergence. One, Buddhist participants were similar to Christian-literalists (and different from secular participants) in believing that humans were meant to have some form of dominion over other living beings on the planet. Two, Buddhist participants did not believe that there were limits on the Earth's capacity to support human life. While non-religious affiliated participants believed that there were finite limits to the amount of natural resources available for human consumption, neither Buddhist nor Christian participants believed this to be the case. What do each of these divergent points mean for climate change beliefs? Both the "human rule" and "earth limit" factors have been shown to predict climate change acceptance. Belief in humans' dominion over other living beings relates negatively to climate change acceptance while viewing the earth's resources as limited is positively related (Dunlap, Van Liere, Mertig, & Jones, 2000; Morrison et al., 2015; O'Connor, Bord, & Fisher, 1999). Therefore, while Buddhist participants in this study were generally more likely to believe in climate change, their beliefs in human dominion and earth's infinite resources for supporting life may be problematic when it comes to support for climate change policy.

Cosmological Temporal Order

It is also possible that religious beliefs can also foster environmental action by broadening temporal horizons and promoting long-term thinking. On the one hand, many scientists propose that if people were able to construe the temporally distal effects of climate change concretely and feel the emotional ramifications of these future events, they would be more likely to take action (Gifford, 2011; Weber, 2006). Religious orientation might be one way to do that as priming studies reveal that religious symbols can reduce temporal discounting and increase future time orientation (Carter, McCullough, Kim-Spoon, Corrales, & Blake, 2012; Oner-Ozkan, 2007). Some evidence suggests Eastern and indigenous religions appear to orient believers to larger-scale time horizons and cyclical processes (Balslev, Mohanty, & Mohanty, 1993). For instance, within the Iroquois and other American Indian tribes, the seventh generation principle is predicated on the idea that every decision must be made with consideration to the impact it will have seven generations in the future (Clarkson, Morrissette, & Regallet, 1992).

It follows then to assume that a longer or cyclical temporal perspective, influenced by Eastern religious perspectives, should promote action to alleviate impacts of climate change. However, as some ethnographic work with Hindu and Buddhist participants suggests, adopting a longer temporal perspective may also have a detrimental effect on environmental behavior in some contexts. In interviews with spiritual priests and leaders about the pollution in the Ganges, Drew (2012) found a commonly expressed belief in the eventual, inevitable decline of the river, rooted in ancient Hindu scriptures. Far from being a cause for alarm, she notes that believers in the Ganges's divinity reasoned that once the river is no longer physically visible it would continue to flow subterraneously as well as on a metaphysical plane. The longer time horizon, in this case, seems to lead to a complacency towards eventual global ecological decline, construed as an inevitable occurrence in the cycle of time. A similar attitude is found in work with Buddhist participants

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where Salick, Byg, and Bauer (2012) note that "Tibetan Buddhists sometimes seem a bit blithe or at least philosophical about the present climate change crisis" as indications of future spiritual events that will lead to the destruction of the universe. The authors suggest that different climate change mitigation actions might be required within cosmological orders that do not view time as a linear process. In these worldviews, while the concrete, immediate future is perceived as existing within a human realm, and manageable by us, the more distant future is controlled by the spiritual realm and outside human influence. Therefore, natural resource managers might think about stressing actions that present solutions to current climate-related issues, which might be viewed as more tractable within these religious worldviews.

Spiritual Pollution

Other studies have also noted that several traditional societies do acknowledge that climate change is occurring, by noting changes in seasonal duration and uncertainty in predicting rainfall based on traditional knowledge. In some cases, these changes are even attributed to human agency but not in ways that have been scientifically validated. Studies with communities in Bangladesh and Nepal show that people believe that the increased frequency of environmental disasters like floods and fires can be attributed to improper religious activities. A female Nepalese participant from Becken, Lama and Espiner's (2013) study noted that outsiders come and "trample the abode of God," desecrating the sacred mountains and leading to calamitous events. Similarly, this type of spiritual pollution as a cause of climate change was an explanation given by some Bangladeshi participants, in a study by Islam et al. (2014): "People doesn't have consistency, faith … like, we are talking to day in one way but tomorrow in changed way … so it has come as a curse from Allah." In other words, this participant believed that inconsistency in faith and promises was a moral hazard that was punished by divine intervention in the form of ecological crises. Essentially, these examples illustrate the intersection between human action and spiritual agency in causing climate change. The spiritual and religious transgressions of humans, usually outsiders, set off a chain reaction, angering local deities, and result in punishment in the form of natural disasters (Byg & Salick, 2009; Sherpa, 2014). Again, these causal models of climate change appear to be deeply influenced by religious beliefs and might require different intervention approaches than climate change models which don't have a religious component. Even if religiously-based models of the environment do not inspire stewardship, they can certainly help people adapt to climate change related environmental effects. As we will see in subsequent sections, perceiving climate change to be a result of one's spiritual misdeeds could have profound psychological effects.

Religion as a Coping Mechanism

Clinical psychologists have long noted that religious beliefs play an important role in helping people cope and make sense of tragedy, suffering and loss (Pargament, 2001). Responding to physical and mental pain with prayer or turning to one's belief in a higher be-

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ing has shown to yield many positive consequences in the medical field (Seybold & Hill, 2001; Wachholtz & Pearce, 2009). Certain forms of religious beliefs and practices have also been found to be effective in promoting healing after natural disasters by providing an existential framework to help people justify why loss and destruction occurs particularly as a result of "acts of God." It is virtually certain that climate change will make severe weather events, such as hurricanes, floods, wildfires, heat waves, and droughts more acute and more frequent. This review, thus far, has examined the role of religion in motivating climate change mitigation actions, but is just as critical to examine the functional role religion may play in helping people adapt to the consequences of climate change.

Personal Beliefs

By providing a sense of order and continuity, religious beliefs may act as an explanatory framework and situate natural disasters within a larger plan. For instance, after the 2004 tsunami in South Asia, Buddhist monks provided naturalistic explanations for the disaster by relying on traditional teachings. These emphasized that while suffering is an innate and constant part of life, one can take back some form of control and alleviate suffering by taking responsibility for one's actions and thinking about the consequences of those actions (Falk, 2010). Schmuck (2000) found that religious explanations appear to be a way to help people more efficiently process why natural disasters happen and how best to survive them. These explanations, e.g. Allah or God as the sole cause of a flood, might be construed as fatalistic and non-agentic, but Schmuck (2000) notes that this is a simplistic assumption. In her study, she found that religious Muslim Bangladeshi participants were able to avoid a sense of doom and despair because of their faith that if Allah caused the disaster then He would be the one to remove it as well. In fact, prayer, in the context of environmental disasters, has been shown to play three important psychological roles: 1) Helping people persevere and survive distress 2) Providing a sense of protection from future negative events, and 3) Believing that it can prevent future disasters (Mitchell, 2003). Prayer may seem like an ineffectual response to non-religious outsiders but for believers it serves key functions that help in adaption to environmental crises.

Additionally, religious beliefs may help believers cope by providing them with a higher purpose in life. Post-traumatic stress disorder (PTSD) is a common effect of experiencing disasters like earthquakes (Madakasira & O'Brien, 1987; Nolen-Hoeksema & Morrow, 1991). Studies have shown that participants who perceive that they have a higher purpose in life and other "positive" dimensions of religiosity (e.g. believing God to be a partner) exhibit fewer symptoms of PTSD and higher self-reported positive emotions (Feder et al., 2013). However, other studies also note that there may be instances in which religious beliefs hinder adaptation to natural disasters (Feder et al., 2013; Stratta et al., 2012). Particular forms of religious coping, particularly when one feels like the natural disaster is a punishment for one's sins or lack of piety, are actually associated with exhibiting more symptoms of PTSD. Once again, as with general environmental regard and climate change perception, these studies suggest that an unequivocal relationship between religious beliefs and adaption to climate change is unlikely. Certain types of practices, such as prayer, or understanding events in a larger religious context, do help people cope with

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loss from natural disasters but perceiving those disaster as a punishment for one's sins has the opposite effect and may hinder healing.

Religious Organizations as Responders

In addition to the belief or faith side of religion, there is a very material role that religious organizations can have in disaster relief. There is a long history of religious organizations acting as first responders and providing refuge, medical care, food, clothing, and funds in the aftermath of natural disasters (Ferris, 2005). Religious organizations are also seen as more trustworthy than other external agencies, an important factor for consideration when communicating with affected people (Greeley, 1997). They are also able to respond more quickly when disaster strikes than outside groups because they are usually already well integrated into and aware of the needs of local communities (Gaillard & Texier, 2010).

However, there are some potential drawbacks of faith-based responses to natural disasters. Religion is a great social binder within communities but may also fortify inter-group boundaries. Twigg (2004) cautions that while faith-based organizations provide significant material support following environmental disasters, there is a real risk of discrimination on the basis of religious affiliation. For instance, discrimination based on sexual identity was a likely cause in some cases of conservative Christian organizations refusing to provide support to LGBTQ communities in the wake of Hurricane Katrina (Farrag, Loskota, & Flory, 2012). In another example, uneven death tolls from famine in Hindu versus Muslim communities in Muslim-dominated Bangladesh indicate that some degree of religious discrimination was present in relief efforts (Hartmann & Boyce, 1983 cited in Gaillard & Texier, 2010). These may be isolated incidents but it is important for all organizations, especially faith-based ones, to maintain adherence to the edict, laid out by USAID and the UN's Development program among others, prohibiting any form of discrimination in rescue efforts following natural disasters (Clarke, 2007).

There are also ethical concerns surrounding proselytization efforts by faith-based relief organizations following environmental disasters. Catastrophic disasters, which can take away all sense of normalcy from people's lives and leave them feeling broken, may, unfortunately, present religious organizations with opportunities to evangelize. As people are left asking existential questions, faith-based organizations are available to provide answers and fill in voids from loss of social communities (Olivo Ensor, 2003). Members of affected communities may also feel as though they have entered into implicit contracts with religious organizations once they accept donated goods or assistance with reconstruction efforts, even though the organization itself may have taken every step to avoid ethical issues of this sort (Sherr, Singletary, & Rogers, 2009). Others have suggested that a more insidious form of proselytization may take place in the form of forced conversions in exchange for disaster relief aid (Jayasinghe, 2007). These examples should be taken as cautionary notes while acknowledging the pivotal role of faith-based organizations in helping people heal after they have experienced trauma caused by natural disasters (Ramsay & Manderson, 2011). Though problems with proselytization and discrimination are possible,

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international relief organizations take great pains to ensure they remain improbable. As communities endeavor to adapt to climate changes, structural changes (e.g. how communities generate power, incentives to reduce consumption, improving water infrastructure) will be important, but adaptation will also require an emotional, cultural and spiritual component, particularly when natural disasters strike. Faith-based organizations will have a significant role to play in helping people cope in years to come.

Media's Use of Religion in Climate Change Communication

Finally, we turn to how the role of religion in climate change perception is communicated to the world at large. The media's reach in shaping public opinion of climate change and other environmental issues is hard to overstate, particularly in the United States and other developed nations (Mazur & Lee, 1993; Sampei & Aoyagi-Usui, 2009; Schmidt, Ivanova, & Schäfer, 2013). The media is one of the main sources of information people rely on, in addition to their social networks, to understand the causes and impacts of climate change around the world, and the means through which climate change may impact their lives more personally (Clayton et al., 2015; Weber, 2010). Numerous studies have shown the variations in discourse practices related to climate change by media type (e.g. broadcast versus print), country of origin (e.g. Chinese versus European versus American) and political-ideological orientation (Boykoff & Boykoff, 2007; Feldman, Maibach, Roser-Renouf, & Leiserowitz, 2012; Hart & Feldman, 2014; Schmidt et al., 2013; Stoddart, Haluza-DeLay, & Tindall, 2016). For instance, the media has often been faulted for increasing public perceptions of uncertainty in climate science and minimizing the extent of scientific consensus on the issue of global warming (Boykoff, 2007; Oreskes, 2004). However, even though religious values have been shown to be a major force in predisposing people to think about climate change in particular ways, not many studies have analyzed what place religion occupies in the media's discourse of climate change. A recent study of British newspapers reveals that the newspapers most likely to use religion in climate change related articles were also the ones that were most likely to distort the level of scientific consensus or treat climate change skeptically (Woods, Fernández, & Coen, 2012). They were also more likely to be published in politically conservative newspapers. Religion was used in the British newspapers in one of three ways: 1) By stating that environmentalism was a matter of faith, not science 2) By describing environmentalists as "fanatics" and unreasonable in their demands and relatedly 3) By portraying climatologists as engaging in blasphemy or heresy. These related and powerful roles of religion in media discourse of climate change together served to undermine the perception of scientific consensus on climate change and made it easier for climate science to be dismissed as the work of a minority furthering a partisan agenda.

While the Woods et al. (2012) paper presents evidence suggesting that religion in climate change communication is associated with climate skepticism, Hoffman (2011) notes that religion and morality is evoked most often by people convinced of climate change. In an

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analysis of several hundred op-ed pieces written in major American newspapers over a two-year period, he finds that religion as a category was six times more likely to be used by authors who wrote advocating for action related to climate change, compared to authors who denied its existence. Furthermore, scientific themes were more than twice as prevalent in climate skeptics' articles as their convinced counterparts. One possible account of this seeming discrepancy between the two studies is the type of newspaper article each examined. The Hoffman (2011) study analyzed editorial articles, which are intended to express a viewpoint and perhaps even seek to persuade others. It is possible, that unlike the more report-based articles in the Woods et al. (2012) study the op-ed pieces analyzed in Hoffman (2011) attempted to appeal to the opposing side. That is, climate skeptics employed appeals that they believed would be most efficacious in convincing climate change proponents (e.g. science) and on the other side, authors convinced of climate change tried to employ religious and moral frames in order to convince skeptics.

Both pieces, however, looked only at print media. On the broadcast media side, we have used the Linguistic Inquiry Word Count tool (Pennebaker, Booth, & Francis, 2007; Pennebaker, Mehl, & Niederhoffer, 2003; Pennebaker & King, 1999) to analyze climate change related transcripts from American news channels from 2000 to 2014. Preliminary analyses suggest that religion-related words are fairly prevalent in these transcripts (e.g. God, pray, Zen, Muslim, etc.) and have maintained a steady level during these years with a peak from 2004 to 2008 (Sachdeva & Gobster, FORTHCOMING). Similar to the Woods et al. (2012) study, we find that more conservative channels like the Fox News Network are more likely to use religious language in discussing climate change than either the network news channels (e.g. ABC, CBS) or other cable news channels (e.g. CNN). We also find greater use of anger and reference to time-related constructs (i.e. past, future, present, now, etc.) in the more religiously tinged climate change. These initial results seem to suggest that climate change is an emotionally-laden topic in American news channels, but one that is widely acknowledged as having implications for the global future. It remains to be seen whether these results can be generalized to other media sources, as well as other cultural contexts.

Conclusion

Some might consider that the solutions to the pressing environmental issues facing the world today will come from the secular, scientific community, discounting or disavowing the role of religions in shaping individual environmental concern and action. This review emphasizes that religion has a pivotal role to play in shaping our ecological future. Religious worldviews, as pervasive components of cultural systems, have important implications for how humans think about their role in nature, how to engage with the natural world and, importantly, how shared resources should be managed. In addition, religiously-based conceptions of human-environment relationships can have a significant impact in shaping climate change policy because, as illustrated in this article, climate change is not only a matter of environmental concern but also about one's community.

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Maintaining awareness of the diversity in religiously-based environmental thought can help land and natural resource managers, along with environmental policy experts, communicate effectively with their stakeholders. Successful implementation of policy designed to increase conservation or stewardship behavior is not only dependent on increasing scientific or ecological education but might also require a deeper understanding the ways in which people relate to the environment, which is often bound to religious worldviews. The participation of local communities in designing sustainable management interventions may be one way of integrating religious, spiritual and ecological objectives.

However, the influence of religion is not monolithic and can influence people's attitudes and behaviors in multiple ways. It is important to understand the difference between these dimensions of religious identity and acknowledge that various facets of religiosity, e.g. a fundamentalist reading of a religious text (Eckberg & Blocker, 1996), regular attendance at religious ceremonies (Kanagy & Willits, 1993; Woodrum & Wolkomir, 1997), viewing a mountain or river as a physical manifestation of a deity (Bernbaum, 2006; Carpenter, 1986), or fearing an end to the known world (Guth, Green, Kellstedt, & Smidt, 1995), can have different impacts on environmental concern. Religion's adaptive function in helping people cope with natural disasters, worsening air quality, and rising sea levels is too often discounted when, in fact, these adaptive functions can be critical to survivors' well-being. An acceptance of God's will in creating a natural disaster may be dismissed as a fatalistic attitude by researchers but can serve a meaningful role in helping people survive and sustain their communities.

It is important to remember that religion is one component of a larger societal picture, and it interacts with economic, political, cultural and media factors in determining people's attitudes towards environmental and climate related issues. Religious values, just as other cultural beliefs, evolve over time and while they may provide a foundation for human-nature relationships, these ideas are shaped by a myriad of factors. This means that no particular religious tradition bears "the burden of guilt" in Lynn White's terms, just as no tradition can be expected to fully promote environmental stewardship. A paradigmatic cultural shift which creates structural opportunities for pro-environmental behavior, including those rooted in religious practices, can be a means to mitigate our current ecological crisis.

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Notes:

(1.) Note, however, that the NAE is one of several evangelical organizations and other have taken a more hard-line stance against environmental action, noting, in particular, their fear a stewardship orientation toward the environment is fast evolving into something akin to "neo-pagan nature worship" (Zaleha & Szasz, 2015).

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