

# Nature, Science, and Religion

## 1

### Intersections of Nature, Science, and Religion

#### *An Introduction*

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*Nature, science, religion.* Each term carries with it claims to truth: *nature* inasmuch as it conveys our beliefs of how things naturally are and should be; *science* in and through its methods, evident results, and institutional prestige; and *religion* in its objects and the commitments they generate among devotees. When these terms become objects of contention—as when claims to truth are questioned—each emits a great deal of heat and light, rather like a small-scale atomic explosion. They are, to use Douglas’s (1975) term, “trump cards,” terms customarily deployed to win arguments. But they are much more than that; where they meet, at those intersections where each of them is unsettled by the others, very interesting things happen. This book examines such spaces of intersection. The relations among the three terms are not symmetrical. Science and religion have been at odds with each other for centuries in the West, while nature has been, in a certain sense, the terrain they have struggled over. In our time of ecological risks and crises, it is the relationship between humans and nature that seems most at stake. Science is frequently (but not always) seen as the crucial ally by people who would wish to address environmental issues; religion has come to play the role of ally only belatedly, and then only in some circumstances. But things are rarely as simple as this, especially once one gets out into “the field,” where most social and cultural researchers get their proverbial hands dirty.

This book is about some of the ways these three terms and the domains they refer to—science, religion, and nature—intersect in challenging, provocative, and complicated ways, in real settings where people attempt to live in some semblance of harmony with their physical environments. The research presented in these chapters explores how scientific knowledge and religious–spiritual beliefs may interact, conflict, or be used to shape natural resource management, environmental activism, and political processes.

Scholars of philosophy, religious studies, and science and technology studies have been at the vanguard of considering and critiquing the roles of religion and science in human–environment interactions. Researchers in the environmental (and related) sciences, by contrast, encounter disciplinary barriers to examining the possibility that religious beliefs influence social-ecological behaviors and processes, because the issue resists quantitative assessment. In one of our cases (Tucker’s, chapter 6, this volume), the possible role of spiritual beliefs and values was at first disregarded in research on community forest management. However, with each successive period of fieldwork, Tucker encountered more and more farmers whose agricultural and forest-use practices engaged religious understandings along with indigenous knowledge and current technical information. These encounters made her wonder how the diverse arenas intersected and influenced social-ecological processes. When the Latin American Studies Association and the School for Advanced Research on the Human Experience (SAR) offered the panel competition “Nature, Science, and Religion in Latin America,” Tucker saw the opportunity to organize a panel with researchers who were exploring similar puzzles. She posted the proposal to an environmental studies listserv, and four other Latin Americanists—three environmental anthropologists and a political scientist—volunteered papers. The proposed panel won the prize, which included the opportunity to hold a week-long advanced seminar at SAR. The panelists shared a goal of interacting with scholars from a variety of backgrounds who worked in different regions of the world. Toward this end, the seminar assembled ten scholars who represented a range of strengths and interdisciplinary experiences. Three of the anthropologists had training in the natural sciences (Mathews, Schnell, and Tucker); a fourth, Ballestero, had been a lawyer, while political scientist Hallum and missiologist Daneel came as environmental activists and established scholars. Norget, Robbins, and Scanlan Lyons had broad anthropological experience, and Ivakhiv’s work on environment and culture drew on multiple disciplines. Together, our diverse backgrounds encompassed science and

technology studies, forestry, natural resources planning, biology, East Asian literature, history, religious studies, and missiology, in addition to political science and anthropology.

When we arrived in Santa Fe for the seminar, we barely knew one another, and most of us felt some uncertainty as we sat down to introductions the first morning. We began to discuss our work, experiences, and perspectives and discovered that we shared more than anticipated. By the end of the week, we had exchanged ideas and contrasting interpretations that stretched our understanding. We experienced a moment of community, nourished by shared intellectual adventures, respect, camaraderie, delicious food, and the tranquil beauty of the SAR campus. Laughter punctuated intense discussions, and lively conversations kept us awake into the night.

Our work resonates with the question that has animated the field of “religion and ecology” since White’s 1967 classic *Science* article “The Historic Roots of Our Ecological Crisis.” The question White implicitly raised—*Does religion shape or affect environmental practice, and if so, how?*—has echoed through debates, uneasy alliances, and continuing tensions among environmentalists, religious–spiritual groups, and natural and social scientists concerned with environmental problems. Our research encompasses contrasting case studies and theoretical perspectives, which suggests that current interactions of science and religion have opened new frontiers for exploring and understanding local human–natural environments and global social–ecological systems. We found no clear answers to White’s question; neither have others. As Ivakhiv summarized during the seminar,

to the extent that there are reliable results, these have been mixed and probably more negative than positive, in the sense that, if anything, *most societies—no matter what their beliefs are—are prone to overdrawing on their natural resource base.* With small-scale indigenous societies, there’s a stronger argument that locally based, adaptively evolved knowledge–belief–practice complexes—as Berkes, for instance, defines traditional ecological knowledge—have tended to result in longer-term sustainability of human–environment interactions. But even if that’s true, the conditions in which those societies developed are not the conditions they find themselves in today. So we cannot look to them in any simple way for answers to the environmental challenges that we face. We need a more complex understanding of all these questions. [Ivakhiv, recorded presentation, August 20, 2009, emphasis added]

We concurred that “a more complex understanding” of human interactions with the environment requires considering human experience holistically; this means an integrative examination of the historical, economic, political, sociocultural, institutional, and spiritual dimensions of human experience. Toward this goal, our work applies ethnographic and related approaches to investigate how specific groups interact with their natural environments (which are always culturally co-constituted) and the larger-level contexts they engage when realizing experiences and responses. Reversing or mitigating environmental problems implies transformations that implicate the full range of human experience and organization. Therefore, our discussions explored possible patterns and synthetic approaches for understanding the ways that empirical–scientific, religious–spiritual, and political–economic endeavors sway societies and transform human relationships with their socionatural and built environments.

In the process, we discovered contrasting viewpoints. Our differences proved productive and provocative and compelled us to question conclusions about our own work and anyone else’s. In the process, we moved toward more complex and nuanced understandings.

## **ANTECEDENTS AND ADVANCES**

In White’s 1967 article, he famously argued that the Judaeo-Christian tradition shared a heavy burden of responsibility for the crisis in relations between humans and the natural world. In the article’s aftermath, historians, theologians, and social scientists responded in one of three predominant ways: by trying to prove White wrong, whether about the ecological “disvirtues” of Christianity or Judaism or about the presumable virtues of other religions; by agreeing with him and calling for an alternative to replace the Judaeo-Christian worldview; or by taking up the charge to research the matter in greater depth. Thus was born the field of “religion and ecology,” and thus began what R. Nash (1996) has called the “greening of religion” (Foltz 2003, 2005; Gottlieb 2004, 2006b; Hessel and Reuther 2000; Kinsley 1995; Palmer and Finlay 2003; Sponsel 2007; M. Tucker and Grim 2001, 2007; Watling 2008). The results of these trends are evident in a series of international meetings and publications, including the gathering of religious leaders sponsored by World Wildlife Fund (WWF) in Assisi, Italy, in 1986 (WWF 1986); the Religions of the World and Ecology conferences held at Harvard University in the late 1990s and the ensuing book volumes (for example, Foltz, Denny, and Baharuddin 2003; Grim 2001; M. Tucker and Williams 1997); the publication of *The Encyclopedia of Religion and Nature* (B. Taylor 2005); and initiatives like the

Earth Charter, a global values statement endorsed to date by more than eight thousand organizations around the world (see also Kellert and Farnham 2002; Oelschlaeger 1994; E. Wilson 2006). Religious–environmental alliances have proliferated in recent years. These range from broad-based international efforts to local grassroots initiatives: they include WWF’s Network on Conservation and Religion, now the Alliance for Religions and Conservation (ARC), Conservation International’s Faith-Based Initiatives Program, the Earth Island Institute’s Sacred Lands Films Project, the International Union for the Conservation of Nature (IUCN) task force on cultural and spiritual values of protected areas, Sacred Sites International, the Green Pilgrim Cities Network (launched in late 2010), and groups like the “Redwood Rabbis,” the Sisters of Earth, the African Earthkeepers of Zimbabwe (Daneel, chapter 10, this volume), the Sarvodaya Movement of Sri Lanka, the Tzu-Chi Foundation of Taiwan, the Interfaith Global Climate Change Network, and the Evangelical Environmental Network, famous for its “What would Jesus drive?” anti-SUV campaign (Daneel 2001; Dudley, Higgins-Zogib, and Mansourian 2005, 2009; Gardner 2006; Gottlieb 2006a; Lee and Schaaf 2003; Posey 2002; C. Taylor 2007).

Scholarly responses to White’s challenge can be distinguished as two main types (see Derr 1975; Livingstone 1994; Minter and Manning 2005; Whitney 1993). The first has focused on ideas, beliefs, and cultural resources—texts, narratives, rituals, images and iconographies, psalms and sutras, and other religious materials—with an eye to interpreting their ecological significance or using them to generate ecologically productive meanings. These efforts can be called “ecotheological” or “religious–ecological” in that they interpret inherited elements of religion in the direction of a constructive project of helping religious communities meet the ecological needs of our time. They constitute a kind of religious turn to ecology.

The second type of response has been to undertake empirical assessments of the ecological practices of particular societies to determine how those societies’ religious–cultural beliefs and worldviews shaped their environmental practices. Analogous inquiries motivated the quantitatively focused work of cultural ecologists such as Rappaport (1984), Vayda (1969), and Reichel-Dolmatoff (1976), but recent research has shown the relationship between beliefs and ecological outcomes to be rather complicated. Indigenous peoples and others with seemingly organic or holistic worldviews have overhunted, deforested, eroded, and otherwise altered their habitats to their own detriment (Burkert 1996; Denevan 1992; Diamond 2005; Gomez-Pompa and Kaus 1992; Krech 1999; Pyne 1997; Redman 1999; Tuan 1968). The relationship between worldviews and

behavior is, in any case, less predictable than social scientists had once hoped. Besides religious motivations, behavior is recognized to depend on economic, social-structural, technological, and intergroup factors, among others (Kempton, Boster, and Hartley 1995; Minter and Manning 2003; Proctor and Berry 2005). That said, some examples suggest a connection between religion and a society's ability to respond to environmental challenges. The fates of Classic Mayan and Greenland Norse cultures are two that come to mind, if only because of Diamond's (2005) popularization of how religion—that is, culturally sanctified and ritualized practices and the vested, institutional interests associated with them—may have played a maladaptive role in each group's ability to meet environmental challenges. On the other hand, the growing discourse of traditional ecological knowledge, or TEK, makes a reasonable *prima facie* case that locally based, adaptively evolved “knowledge-practice-belief complexes” (Berkes 1999) result in relative sustainability.

Debates over “noble savages,” “ecological Indians,” and theories of “Pleistocene overkill” are unlikely to be settled anytime soon (Harkin and Lewis 2007; Krech 1999), but even if some measure of authority is granted to a sophisticated TEK version of the “ecological Indian” hypothesis, the conditions in which such societies developed (as pointed out already) are dramatically different from those of the past, making any lessons from the past elusive in the present. In real-world situations involving indigenous groups, it is difficult to disentangle the religious factors from others: material and environmental factors, such as the perception of a shared environmental emergency, as in the Zimbabwean case study discussed by Daneel (chapter 10, this volume); social and psychological factors, such as the role of charismatic personalities, organizations with their needs for growth and expansion, social movements, interest groups, and social-structural conditions; and so on. Research on the roles of religion, ritual, belief, mythic narrative, and the like, within institutions of cultural-ecological practice remains important and perhaps essential—a point made or assumed by most of the authors in this volume—but the precise relationships among any of these pieces (ritual, myth, and so forth), like their definitions, remain elusive.

Having broached the question in this way, let us take a few steps back and think about the three terms of our title: *nature*, *science*, and *religion*.

## **CONCEPTIONS OF NATURE AND ENVIRONMENT**

In a historical overview of the meanings of *nature*, Raymond Williams (1976:219) calls it “perhaps the most complex word in the [English]

language.” He traces out three general “areas of meaning”: nature as “(i) the essential quality and character of something; (ii) the inherent force which directs either the world or human beings or both; (iii) the material world itself, taken as including or not including human beings.” Ecophilosopher Evernden (1992:20–21) points out that once we have articulated a concept of nature as distinct from “all things” or “the world as a whole,” it becomes possible to speak of some things as belonging to nature or being natural and of other things as being unnatural (or supernatural). *Nature* has therefore come to function as a boundary term demarcating a primary realm (which can consequently be elevated or downgraded) from a secondary realm of the human, cultural, or unnatural. It is a term that denotes value and that, as Douglas (1975) and others have shown, is often used as a discursive trump card (Cronon 1996; Franklin 2001; Glacken 1967; Horigan 1988; Ivakhiv 2002; Soper 1995; Urry and Macnaghten 1996).

A genealogy of Western concepts of nature would include the following: nature conceived as a divinely ordained system of norms and rules, rights and obligations; a book to be read, divined, and studied; a motherly female, nurturing and providing for the needs of her children (or punishing them at whim); a body-like organism whose features mirror those of the human body; a clock-like object or machine to be studied dispassionately, taken apart, and used for human benefit; a ruthless and harsh kingdom from which humans should distance themselves through the social contract of civilization; a flourishing web of life; a storehouse of resources; an Edenic garden to be set aside in protected areas and visited periodically for the replenishment of one’s soul; a museum or theme park for curiosity seekers or an open-air gymnasium for trials of masculinity; a cybernetic system or data bank of circulating information; a spirit or divinity or a locus for the residence of many spirits; and an avenging angel, capriciously and unpredictably meting out its inhuman justice to a humanity that has transgressed its natural order. Each of these concepts and images carries assumptions about what kinds of action are appropriate in relation to it, from subjugation, control, measurement, prediction, and management to aesthetic contemplation, protection, and active resistance on its behalf (Ivakhiv 2001:36ff.).

Environmental movements have drawn strategically on scientific and popular understandings of nature. Since the 1960s, environmentalists have made effective use of the ecological idea that nature, when left to its own devices, tends towards exhibiting a dynamic balance or equilibrium among species, ideally leading to climax ecosystems of maximum diversity (for a given climate), harmony, and stability. This image of nature, however, has

been all but rejected within the ecological science of the past four decades. Instead of a balance of nature, the natural world is more typically seen as an unstable and nonlinear one characterized by a ceaseless movement of individual organisms, species, and communities, whose overall trajectory is directionless and in many ways unpredictable, even chaotic (Worster 1996 [1994], 1997). Even tropical ecosystems—the paragons of nature’s flourishing and harmonious balance—have been shown to have undergone extensive climatic and ecological change and to have been influenced for millennia by human beings through hunting and fire (Balée and Erickson 2006; Denevan 1992). If nature, as ecologists like Botkin (1990) point out, is always changing and always being remade by human activities, then how can it function as a “transcendental signified”—a source of values, direction, and religious inspiration or guidance? Other scholars have countered that a nature as complex and unpredictable as this one needs all the more to be treated carefully: in situations not fully controllable, we must apply the precautionary principle and the tools of adaptive management, not only of our resources but of ourselves as well.

## **SCIENCE AND ENVIRONMENTAL PROBLEMS**

If nature presents uncertainties as a guide to human behavior, then science, as the enterprise that seemingly deciphers nature for us, presents its own uncertainties when viewed through a historical prism. Even specifying what science *is* can be challenging. Science can be thought of as a form of inquiry (the scientific method), as what scientists do (including their errors, human faults, and ideological stances), as established or verified truths resulting from those methods and activities (such as the First Law of Thermodynamics), as popular science (Bill Nye the Science Guy, children’s science museums, kits, and fairs), or as high technology and socially and environmentally transformative Big Science (space travel, nanotechnology, the Green Revolution). In addition, anthropologists have pointed to “ethnoscience,” or locally based and long-enduring pragmatic knowledge practices, as empirically tested understanding comparable to that of Western science (González 2001; Malinowski 1992[1925]; Nazarea 2003). Indigenous science, however, can be couched within worldviews that Western scientists fail to comprehend (Nadasdy 2007; Verran 2001).

From a historical perspective, science arguably has been less about finding truths as it has been working with interpretations of observed reality that seem to perform well at the time but that are replaced or reinterpreted as new paradigms and evidence emerge. Science thus involves



evolving ideas and perspectives, and over time it has proven to be a self-correcting enterprise. It is equally true that the efficacy of science to discover specific facts does not ensure that scientists will follow scientific principles in asking questions or interpreting their results. Kuhn (1970) and Young (1972) noted contradictions between the ideals of the scientific method and the reality that scientists tend to work unquestioningly within the dominant paradigms of their time. In some ways, belief in a scientific paradigm bears similarity to religious faith (Kuhn 1970). In one telling example, anthropologist Nader (1996) served on a committee charged with examining energy use and policy, and she observed scientists ignoring data that suggested the possibility of a “low energy, high technology” society. By faithful adherence to the dominant ideology and “group-think,” the scientists reinforced an unsustainable “high energy, high technology” economic model (Nader 1996). Intentionally or not, scientists at times have been complicit with powerful political and economic interests.

Environmental problems have presented new conundrums for considering the relationships among the sciences, politics, and economics. Scientific investigation has made some progress in identifying drivers of environmental degradation and climate change (Friedlingstein and Solomon 2005; Geist and Lambin 2001; Malhi et al. 2008; Peters et al. 2006). But scientific findings have not transformed the confounded political, socioeconomic, and institutional relationships that propel these drivers (Ascher 1999; Caddy and Seijo 2005). Moreover, complex social and ecological systems present thorny challenges for scientific investigation, due to the difficulties of examining numerous interactions and linkages among climatological, biophysical, and socioeconomic processes (Dessai, O’Brien, and Hulme 2007). From a scientific perspective, climate change science appears to be proceeding as it should: results and projections have been revised as data accumulates, while flawed analyses have been reexamined and rejected. By contrast, the media often represent scientific consensus, such as the Intergovernmental Panel on Climate Change, as exaggerating the risks of climate change. Interestingly, recent work on the social construction of science suggests that scientists have accommodated political and social opposition by underestimating climate change risks (Freudenburg and Muselli 2010).

A different situation exists for conservation biology and environmentalism, which have found political allies in their efforts to protect endangered animals and habitats. Governments have used conservation science to justify the forcible removal of native populations from areas designated as parks or nature reserves, even where inhabitants have

shaped and maintained these “natural” environments (Brockington 2002; see also Brandon, Redford, and Sanderson 1998). In North America, environmentalism and protected area creation have rested on romanticized visions of untouched wilderness and overlooked the degree to which human activity has transformed and created nature (Cronon 1996; Denevan 1992). Tsing (2005) points out that conservation biologists have been motivated by an understanding of nonhuman life-forms, therefore overlooking human influence. At the same time, social scientists and activists have emphasized human rights over biodiversity conservation and viewed plants and animals as resources to be exploited. Accumulating evidence has found a strong correlation between cultural diversity and biological diversity (Ayres 2003; Cocks 2006; Stepp, Castaneda, and Cervone 2005), but neither the natural nor social sciences have adequately grasped the interdependence of humans, plants, wildlife, and landscapes (Tsing 2005). Instead, naturalists and philosophers writing in the humanist tradition, from Thoreau (1995[1854]) and Leopold (1970) to E. Wilson (2006) and Lopez (1978, 2001[1986]), and others, have made greater advances in conceptualizing human interdependence with the natural environment.

By recognizing the shortcomings of science, we do not deny the utility of the scientific method, or more broadly, empirical investigation to extend certain realms of knowledge. Indeed, we ground our work on careful observation. We nevertheless recognize that science has multiple expressions and manifestations. Similar to any other human endeavor, science is subject to vagaries of context and perception, as well as political and economic expedience. A genuine commitment to knowledge—whether scientific or humanistic—requires us to question our assumptions, or we could reproduce biases that prevent us from recognizing alternative interpretations or discovering unexpected patterns (Cronon 1996).

Because science has become increasingly influential and authoritative through the twentieth century (Nader 1996), many groups (even the marginalized) have found it strategically advantageous to present themselves or their positions as scientific in their struggles against opposing groups, which also claim scientific justifications for their own positions. Just as science means different things to different people, the information and ideas that it produces can be distorted or appropriated for diverse purposes. Chapters 3 and 4 by Robbins and Mathews, respectively, examine how groups can make claims of scientific ideas for their own purposes, regardless of their actual scientific credence. Similarly, chapters 2, 4, and 5 by Scanlan Lyons, Mathews, and Norget, respectively, examine novel alliances that emerged as different groups identified common environmental

concerns and terms to act on their predicaments. By contrast, P. West (2006) found that an environmental alliance in Papua New Guinea worked because different groups misunderstood one another's terms of reference. The polyvocality of scientific knowledge intrigues many of the researchers who participated in the SAR seminar as we endeavor to understand how humans interrelate with their natural, or not-so-natural, environments.

## **RELIGION AND THE ENVIRONMENT**

How, then, do we fit religion into this already complicated picture? Just as nature and science have varying definitions, scholars have defined religion in various ways: according to the objects of devotional practice and belief, such as deities or superhuman entities or powers; the moral systems or answers to questions of "ultimate concern" (Tillich 1959) arising from narratives about superhuman or exemplary figures; the cosmological or other propositions to which believers give assent; the rituals and cultic practices that provide a community with a sense of social solidarity (Durkheim 1976[1912]) or of belonging to a particular "chain of belief" (Hervieu-Léger 2001); or the "webs of significance" connecting human thought and behavior and providing both with the "aura of factuality" that makes life meaningful (Geertz 1973). Both *religion* and *the sacred* are terms that emerged historically as categories distinguishing certain things from others: religion from magic and superstition or from science, politics, and the secular; a religion as an identifiable system of related beliefs and practices that is clearly distinguishable from other such systems; the sacred as against the profane or secular; and so on (Asad 1993; Beyer 2006; Dubuisson 2003; Fitzgerald 1997, 2000, 2007; Latour 1993; Luhmann 1995; McCutcheon 1997; Styers 2004). In the encounter between Western and non-Western societies, the concept of religion has evolved from being a tool of measurement and speciation (Do Amerindians have souls?) to one of comparative evaluation (Where on the ladder of evolution do they fall?) to one of cultural management (How do we make room for them?). As Lambek (2008) points out, religion emerged as a category that circumscribed Western or European forms of religion within discourses of politics and statecraft and simultaneously inscribed and institutionalized these forms of religion as normative and universal.

Several features of religion are given heightened examination in the chapters of this book. Religion's function or role within a cultural or social-ecological system is a prominent and recurrent theme. As popularized in the cultural ecology of Steward (1955), Rappaport (1984), and others, as well as the TEK paradigm, ritual practices might be seen as institutionalized,

belief-practice complexes that maintain stability, order, and reciprocity in relations between humans and the perceived or conceived transhuman world. Although cultural ecology is thought to have foundered on its functionalist and quantitative assumptions, some people continue proposing variants of cultural–ecological–religious holism (Anderson 1996; E. Messer and Lambek 2001; Peet and Watts 1996; P. Robbins 2004). Such is Parajuli’s (1998, 2001) notion of “ecological ethnicities.” According to this, religious or cultural sensibilities tie together shared values, cosmological ideas, social-organizational principles, and some relationship to land or territory and to identity. Roughly analogous is Dasmann’s (1988) distinction between “ecosystem people” and “biosphere people.” The postcolonial literature features a range of interesting, if not uncritical, engagements with this kind of distinction, from Mignolo’s (2000) “border gnoseology” to Escobar’s (2008) “territories of difference.” In this spirit, Norget’s contribution to this volume (chapter 5) proposes that such terms as *cosmovision*, *moral ecology*, and *ecological cosmology* carry a useful sense of the continuity between a small-scale society’s lived cultural phenomenology and its non-human environment.

Some of the authors here, including Robbins, Tucker, Hallum, and Schnell (chapters 3, 6, 7, and 8, respectively, this volume), appear to be probing the usefulness and the limitations of the model articulated by White (1967). In this, traditional or indigenous beliefs and practices place constraints on people’s behavior—constraints that shape the environmental efficacy, or ecological footprint, of a given community, whether or not they are intended as such. Traditional peoples live within animate worlds of mutual obligations with spirits or nonhuman beings, and their beliefs constrain the behavior of members of the communities, ideally limiting their environmentally destructive behavior. Modernization processes, on the other hand, disenchant and despiritualize those worlds to enable life without the constraints and obligations.

More commonly, however, religion is seen in this volume as a set of mobile references. Ritual, in Robbins’s chapter 3 on the Urapmin of Papua New Guinea, is a traveling set of artifacts that takes on new functions in new contexts. The ecorituals developed by the African-instituted churches and the Shona Traditionalists in Zimbabwe, in Daneel’s account (chapter 10, this volume), are generative; they forge new relations even as they revive broken ones. Other chapters articulate religion more diffusely, as religiosity, spirituality, and the sorts of things that scholars have referred to as “diffuse” or “implicit religion,” “nature religion,” and the like (Ivakhiv 2006). Ballestero (chapter 9, this volume) speaks of “faith” in similarly diffuse

terms, without any reference to the trappings or practices of religion per se. This apparent shift toward a diffuse sense of religiosity, spirituality, or faith might be taken as evidence of a desire for a more open-ended alternative to the religious–secular duality. But perhaps more so, it demonstrates a desire for a broadened understanding of science, knowledge, and practice, a way of articulating the shared space in which people, lacking the firm and final knowledge that science always promises but never quite delivers, can make do with a politics of a world-to-come that always remains a not-yet—a “cosmopolitics,” as Stengers (1996–97) calls it, that grows in the gaps between rival knowledge systems, rival cultures, and (crucially) rival natures. Ivakhiv develops this argument in the concluding chapter to this volume.

### **OVERVIEW OF THE VOLUME**

The case studies that compose this volume examine instances in which scientific and religious perspectives overlap, interact, and become entangled with specific human–environmental challenges. With the exception of Ivakhiv’s synthetic closing chapter, each explores a different social–ecological context, with particular experiences of people facing environmental issues. All of us share a commitment to ethnographic research, and our discussions rely variously on participant observation, interviews, surveys, and archival research. As a general rule, we use pseudonyms for individuals unless they are public figures. We also found that our participation in the SAR seminar influenced our thinking, so we refer to one another’s work and our joint explorations of the constructions of nature, science, and religion as they played out in our research.

Scanlan Lyons examines how threats to the natural environment spurred unlikely alliances across environmental and religious groups in Bahia, Brazil (chapter 2, this volume). The poverty-stricken region encompasses one of the world’s biodiversity hotspots, and conservationists motivated to protect the endangered Atlantic Forest have long been at odds with social and religious groups struggling to address social injustice. The dual threats of an open-pit mine and construction of a deep-sea port beside a marine protected area motivated groups to join forces in hopes of preventing the adverse environmental consequences. Shared experiences of suffering and economic deprivation helped to unify people around ideals of environmental and social justice and servant leadership. Many religious leaders in the region see the natural environment as integral to their spiritual well-being, and many environmentalists are faithful churchgoers and recognize that human suffering and environmental degradation are connected. Religious and environmental motivations for action have interacted and merged, creating a

dynamic social movement that recognizes the linkages among social, economic, and ecological problems and the need to address them collaboratively. In this context, the merging of religious values with a scientifically grounded environmentalism empowered new understandings and action.

The merging of religion and science takes a very different turn in the cases presented by Robbins, who explores the development and implementation of spiritual warfare among charismatic Christians in the USA and the Urapmin people of Papua New Guinea (chapter 3, this volume). In the USA, charismatic Christians adapted ideas from the social sciences to develop more effective means of converting people. Central to their mission was the idea of spiritual geographies, in which certain spaces are dominated by demons. To bring people to Christianity, demons had to be ousted through spiritual warfare. When the animist Urapmin people encountered charismatic Christianity, they welcomed spiritual warfare as a way to end their obligations to spirits of the forest that limited their use of forest resources. By liberating themselves from the spirits, they intended to end taboos on forest use and attract a mining company, jobs, and wealth. Thus, charismatic Christians pursued a path that enchanted science, whereas the Urapmin endeavored to disenchant nature. The case of the Urapmin reveals the flaws in idealistic perceptions of indigenous groups living happily and sustainably with their traditional visions of nature. Indigenous peoples may wish to change their lives and beliefs and adopt Western religion and science to conquer nature.

Mathews presents another case in which indigenous groups link religious practice and scientific claims to achieve specific purposes (chapter 4, this volume). Unlike the Urapmin, the indigenous Mexicans studied by Mathews merged traditional religious ideas with desiccation theory in an effort to protect valued natural resources and resist an interventionist state. Desiccation theory posits linkages among climate, forests, and water flows, proposing that deforestation leads to higher temperatures and less water. In the early twentieth century, the Mexican state used the theory to justify its opposition to traditional agricultural practices that included forest clearing. Although desiccation theory fell from favor among foresters, it was embraced by rural communities as providing a scientific justification to defend their forests from state logging. By appropriating desiccation theory, indigenous groups built alliances with culturally distinct urban populations that share concerns for water availability. Thus, desiccation theory transmuted from a tool of the state to protect forests and criticize rural practices into a tool for rural communities to oppose the state and its forest policies as immoral and irresponsible. Mathews's analysis delves into the

malleability of scientific knowledge and its vulnerability to dispute, along with the fluidity of social boundaries as people from very different cultural and environmental contexts seek alliances to challenge state authority and defend deeply felt needs and beliefs.

Efforts to protect land and resist the state also motivate the rural peoples studied by Norget (chapter 5, this volume), whose research in Oaxaca, Mexico, finds synergies and contrasts with Mathews's work. Norget posits the existence of moral ecologies, which serve to express and confirm people's relationships with their land and empower them to resist state hegemonies. In her study site, state intervention in indigenous communities, including the construction of a dam that displaced many people, provided motivations for them to unite against the state. They refer to sacred, spiritual powers in claiming supernatural justification for their environmental activism. She points out that some Oaxacan peoples have come together around Catholic and traditional ideas to express their linkages to a landscape inscribed with sacred significance. In the process, they are affirming moral ecologies that lend meaning and motivation to their social, environmental, and political endeavors. Their struggles reveal alternative ways of perceiving and living in the world, with ramifications for their cultural and ecological futures.

Whereas the rural Oaxacans endeavor to recapture and affirm their ecological and religious heritage, Tucker discusses how the Lenca people of western Honduras are forming syncretic beliefs that reformulate traditional conceptions of their land and its resources (chapter 6, this volume). Traditional indigenous practices and Western science meet and merge as the Lenca apply traditional agricultural rituals to new contexts, transform forests to shaded, highly biodiverse coffee plantations, and maintain a communal cloud forest reserve. Catholic and Evangelical churches have opposed traditional beliefs and rituals, but these traditions have not been abandoned as much as driven into hiding, transformed into new expressions, and adapted to fit new realities. After testing and rejecting state-supported technical advice to adopt sun-grown coffee, Lenca farmers now receive recognition for sustainable coffee production as scientific advances and market demands acknowledge the advantages of traditional shade-grown coffee. By contrast, community efforts to create a watershed reserve reveal the influence of Western conservationist ideals and national environmental rhetoric. Thus, syncretism can entail creative adaptations, not simply a decline of traditional practices and knowledge, as social, economic, and environmental contexts evolve.

Hallum's study offers a contrasting experience that emphasizes the

resilience and power of indigenous beliefs as she relates her work in Guatemala with the Alliance for International Reforestation (AIR), a non-governmental organization (NGO) (chapter 7, this volume). She analyzes the relationships between religion and conservation she encountered while working with Maya peoples on reforestation projects. The integration of traditional beliefs and rituals added meaning to tree planting and constructing efficient wood-burning stoves. She argues that the vivid power of symbols contained in syncretic Catholic and Mayan beliefs and practices reinforced the scientific knowledge involved in reforestation, making tree planting a meaningful endeavor that dovetailed with cultural values. AIR's successes point to the value of participatory, grassroots efforts that involve local people as leaders from the beginning, and she argues that other NGOs could benefit by incorporating local religious rituals and indigenous knowledge in their projects.

Local knowledge and ritual also offer provocative insights in Japan, where Schnell explores the affective dimensions of ritual in human cognition of the natural environment (chapter 8, this volume). He focuses on two models of mountain climbing that reveal dramatically contrasting perceptions of nature. The dominant model is exemplified by Walter Weston, a late nineteenth-century English clergyman who gained fame in Japan for his popularization of mountain climbing as a purely recreational activity. The alternative model derives from the example of Banryū, an early nineteenth-century Buddhist monk who climbed mountains as a spiritual endeavor to experience nature and merge with it directly. Whereas the Weston model emphasizes human mastery over the physical landscape, the increasingly popular Banryū model favors veneration and respect for nature as a vital presence. Both models can be seen as carrying ritual dimensions that express values about human relationships with the natural environment and influence cognition and behavior. The Banryū model, however, has greater potential to encourage environmentally conscious and sustainable practices.

Human cognition of the environment and conflicting models of nature play very different roles in Ballestero's examination of water politics in Brazil and Costa Rica (chapter 9, this volume). In both nations, scientific modeling, legal frameworks, and public experiences with water scarcity create incommensurable knowledge and convictions. Nevertheless, people with opposing convictions return again and again to the negotiating table with minimal expectations of an agreement. Yet representatives of state powers refrain from imposing their will, and those representing public concerns patiently persist in identifying and questioning weaknesses in



the scientific models. Ballestero discovers in these cases a generative, inexplicable faith in the value of process and the possibility of unforeseeable innovations despite manifest uncertainties. She avoids the tendency to see faith as a religious form of conviction and proposes a nonreligious faith that allows surrender to uncertainty and tolerance of possible failure. Faith unexpectedly becomes a key to negotiation, political process, and active engagement with social, economic, and ecological conundrums.

The hopeful outlook of Ballestero contrasts with Daneel's account of Zimbabwe's Earthkeepers movement (chapter 10, this volume). Unique in this volume, Daneel contributes the perspective of an environmental-activist Christian lay-minister, missiologist, and scholar. For more than a decade, he helped to lead an ecumenical reforestation movement of traditional African and Christian churches. The creation of tree-planting rituals that honored both religious traditions provided a context for new understanding and cooperation. Then Zimbabwe's political and economic situations deteriorated dramatically, which exacerbated internal, organizational weaknesses and drove the movement to collapse. The experience points to the great potential for environmental restoration and group alliances when people actively integrate spiritual and environmental values and practices. The subsequent disintegration reveals the vulnerability of grassroots movements to outside pressures and internal shortcomings. Daneel reflects on the difficult lessons of faithfulness and failure in a seemingly intractable situation and embraces Ballestero's vision of a generative faith that tolerates uncertainty and allows for the emergence of unforeseeable possibilities.

In the final chapter, Ivakhiv reflects on the case studies presented, synthesizing their insights into the role and meaning of religion amidst social-ecological challenges for which science may be necessary but not sufficient (chapter 11, this volume). He points to three broader shifts in the relations among science, religion, and nature: a turn to ecology within communities of faith, a turn to religion among environmentalists, and a return of prominent intellectuals to the vitality of religion in the post-Cold War and post-September 11, 2001, world. Citing Bruno Latour's argument that modernity has segregated science from politics, authorized science alone to speak on behalf of nature, and relegated religion to the realm of private belief and morality, Ivakhiv argues that the case studies reveal a science, a religion, and a nature that are much more plural, hybrid, and entangled with one another than our formal conceptions of them suggest. He advocates that these hybridities be viewed not as exceptions but as the rule, that what counts as science, as knowledge, as religion, and as nature be thought of as active "co-articulations" of people and material relations—"cosmopolitical"

propositions negotiated among multiple players. The future, he suggests, lies in a willingness to enter into spaces of uncertainty, in which novel articulations make possible new relations among scientists, environmental activists, policy makers, religious believers, indigenous people, and others.

## **OPENNESS TO UNCERTAINTY**

The gritty and sometimes grim realities of the social-environmental problems we discussed at the seminar could have been depressing. Most of us had worked with impoverished and marginalized peoples, and we had witnessed processes that harmed human lives along with the natural environment. Through our conversations, we found glimmers of hope and cause for encouragement. Inus Daneel, who has witnessed tragedies that most of us could barely imagine, shared his struggle with despair and then inspired us with the conviction that failure can provide fertile ground for renewal. Scott Schnell brought deep knowledge of Asian religious traditions and ritual, along with an unshakeable patience and a lucid perspective that kept discord and confusion at bay. Andrea Ballestero applied her insight that faith can embrace uncertainty, revealing a remarkable ability to gently deconstruct our analyses and offer alternative interpretations. Colleen Scanlan Lyons analyzed the ways that shared religious convictions and sensed connections with nature might inspire creative, collective action, simultaneously enlivening our conversations with her irrepressible enthusiasm. Anne Hallum reminded us that traditional societies may have much to teach the modernized world about human interdependence with nature and convincingly argued that respectful activism can empower marginalized peoples to address their social-ecological challenges. Kristin Norget called attention to the complexities of power relations and encouraged closer examination of the struggles over religious beliefs, cultural values, and knowledge claims that play out in social-ecological problems. Andrew Mathews examined how science can be transformed as it is appropriated to support diverse political agendas, and he thoughtfully challenged attempts to generalize about human-environment interactions. Joel Robbins pointed out that religion and science can imitate each other and be crafted in unpredictable ways to shape social and environmental processes, imparting an upbeat outlook. We, co-authors of this introductory chapter, brought our own strengths to the table: Adrian Ivakhiv's knowledge of theories of nature, environment, science, and religion and his careful reading of each contribution grounded our discussions in a rich philosophical heritage. Catherine Tucker's attentive facilitation, coupled

with an anthropological appreciation for diverse perspectives and an environmental scientist's pragmatism, steered us on a productive course.

On the last night of the seminar, we all sat on the patio sipping wine and talking as if we had been lifelong friends. We began to share our favorite memories and songs. Joel taught us the "bighead time" song that the Urapmin had created in their enthusiastic move to accept Christianity, vanquish the forest spirits, and attract development. Halfway around the world, here we were, also endeavoring to challenge established ways of knowing and encounter new ways of understanding. Unexpectedly, we shared much in common with the Urapmin. The song dissolved into laughter and the silence that friends share when words are unnecessary. It ended a week in which we all contributed diverse experiences and reflections. As our conversations concluded, we had not found answers to the conundrums that drew us together. Instead, we affirmed that embracing uncertainty proves requisite to understanding and navigating the mutable landscape of nature, science, and religion that our own and other scholarship begins to map. We acknowledged that this landscape, already rife with conflicts, is also rich with possibilities. This embrace of uncertainty encourages us to explore a full range of interpretations and responses as social-ecological-ideational systems undergo transformation. We share hopes for unforeseeable emergences, perhaps for radically new natures, that might allow for social justice, environmental sustainability, and cultural and biological diversity to co-exist and flourish. These hopes may seem fleeting and ungraspable even as we anticipate and envision them. The chapters that follow, while divergent in their social-ecological contexts and to some extent in their focal concerns, reflect our shared engagement with this terrain of uncertainty and possibility at the intersections of nature, science, and religion.