
Faith and Science as Partners in Environmental Awareness and Creation Care: An Ecologist's View

Nalini M. Nadkarni

Professor of Biology

University of Utah, School of Biological Sciences

Salt Lake City, Utah

Trees are sanctuaries. Whoever knows how to speak to them, whoever knows how to listen to them, can learn the truth. They do not preach learning and precepts, they preach, undeterred by particulars, the ancient law of life.

— “On Trees,” Herman Hesse

Last winter, I spoke at a synagogue in Olympia, Washington. The congregants had come on a January night to hear my sermon on the topic of trees and spirituality. As an academic ecologist and a conservationist, this event was part of my exploration of ways to discuss the critical connections between humans and nature in settings well outside of academia¹. One member of the congregation was elderly and dressed in disheveled clothes. At the end of the discussion, he stood up, his eyes directed upward. “When it is raining,” he said, “and I stand under a tree, I stay drier and warmer than when I am out in the open. Trees protect me.” He paused. “Sort of like God.”

No conservationist—nor theologian—could have made a stronger statement. Many scientists consider religion to fall outside of the way they understand the world. But I think that if scientists can communicate how people of different faiths describe trees in their own holy texts and in their own places of worship, we might inspire followers of those religions to fruitfully exchange ideas about how to collectively be better stewards of forest ecosystems. The approach I used in the synagogue that night—and which I describe here—is an example of how scientists and faith-based ground can find authentic common ground that is authentic and can catalyze efforts to protect the Earth².

Throughout human history, many religious traditions have examined the concept of Earth's cycles and their stewardship. More recently, historians of science have explored how explanations of life in scientific and religious terms are closely intertwined³. By

1. N. M. Nadkarni, “Not preaching to the choir: communicating the importance of forest conservation to nontraditional audiences,” *Conservation Biology* (2004), 18:602-606.

2. N. M., Nadkarni, “Ecological outreach to faith-based communities,” *Frontiers in Ecology and the Environment*, (2007), 5: 332-333.

3. J. Stilgoe, S. J. Lock, and J. Wilsdon, “Why should we pro-

Many scientists consider religion to fall outside of the way they understand the world. But I think that if scientists can communicate how people of different faiths describe trees in their own holy texts and in their own places of worship, we might inspire followers of those religions to fruitfully exchange ideas about how to collectively be better stewards of forest ecosystems.

placing discussions about how crucial nature is to human well-being in settings outside the university, both the scientist and the non-scientist may be more open to exchanging ideas⁴. My approach puts these concepts into direct practice, by exploring ways to directly interact with religious communities by delivering sermons, creating printed materials about trees growing in the sacred grounds of churchyards, and participating in church-led ecological restoration activities.

I describe novel ways that environmental scientists might forge relationships with faith-based groups to increase a sense of stewardship for trees, forests, and nature. This has involved finding common ground between scientists and faith-based groups in venues of religious worship. Clearly, many church-goers are aware of and interested environmental issues, but people who come to church or synagogue or a temple are in a receptive mode—they

mote public engagement with science?” *Public Understanding of Science* (2014), 23:4-15.

4. J. H. Brooke, *Science and religion: some historical perspectives* (Cambridge: Cambridge University Press, 1991).

make time, dress carefully, sit quietly, and have open hearts and minds in that time and place to consider matters of their spirit and of truth. So, places of worship can be optimal venues to explore links between the ecological values of trees and their spiritual values to evoke a stronger sense of conservation for all involved.

The lens of the scientist

Ecologists are charged with understanding and communicating the ecological values of the natural world from the standpoint of science. They are trained to bring the tools of science—observation, experimentation, modelling—to document patterns, understand processes, and make predictions following disturbance. Ecologists are also trained to communicate their research findings to other scientists in language that is efficient, technical, and targeted toward our closest peers.

There is nothing wrong with this mode of understanding or communication. In fact, I have embraced it for my forty years of being a faculty member at academic institutions. However, it is growing increasingly clear that scientists—at least some scientists—must go beyond the typical modes of scientific communication if we are to be effective in motivating the large pool of non-scientists to conserve and sustainably use the natural world. The scientific literature can be exclusionary among people who are not schooled in the language of science. Non-scientists must often rely on the media to “translate” scientific work into the more accessible forms of popular magazines and television documentaries. Although many media people are sincere and well-trained, they sometimes overlook the complexity of environmental issues.

When scientists decide to spend some of their time and energy in communicating with non-scientists, however, they usually choose to give presentations to groups who are already convinced of the importance of conservation. Usually they write articles for natural history magazines, or give talks to nature groups, whose readers and listeners are already convinced of the importance of conservation and sustainability. Thus, environmental practitioners have been exhorted to expand their communication spheres and to go “beyond preaching to the choir.”

A listening approach

I decided to try to uncover common ground by drawing upon the authorities of religious texts rather than just scientific texts, and then to directly provide that information to faith-based communities in venues where they worship. I did not attempt to convince faith-based communities of the importance of trees based on science. Rather, I relied on their authorities, their scriptures, to tell them what they already know, what has already been written.

Academic scientists like me tend to think of themselves as the authorities. We are so used to thinking that we need to increase science literacy in the general public, that we do not listen to other groups in society and learn from them. A scientist doesn't have to become a Lutheran or a Catholic to listen to Lutherans or Catholics, just as Lutherans and Catholics don't have to become scientists to listen to what scientists might have to offer. Thus, I

It is growing increasingly clear that scientists—at least some scientists—must go beyond the typical modes of scientific communication if we are to be effective in motivating the large pool of non-scientists to conserve and sustainably use the natural world.

started my work by reading the Old Testament, the New Testament, the Qu'ran, the Talmud, the Bhagavad Gita, and Buddhist stories, and searching for the items that related to trees and forests. I then synthesized those items into sermons that highlighted the uses and importance of trees and forests in the lives of people of each of those faiths and presented them in venues for worship.

This approach is one example of a growing movement among ecologists and religious groups to improve humans' relationship with nature. Hundreds of projects involve “the greening of religion.”⁵ As environmental issues grow more urgent, an unexpected but effective collaboration between environmentalists and conservative evangelical Christians has occurred. In 2006, eighty-six evangelical leaders signed the Evangelical Climate Initiative, a statement that calls upon believers to urge federal legislation to reduce CO₂ emissions through a cap-and-trade market system.⁶ Signatories of the statement included the presidents of thirty-nine evangelical colleges and pastors of mega-churches. They preach a gospel of “creation care”, wherein God gives people dominion over the Earth, and with it an obligation to carry out good stewardship of the land, air, and water.

What religious authorities and places taught me

My source materials came from web-downloading and searching the Bible, the Talmud, the Qu'ran, and Hindu and Buddhist scriptures for quotations containing the words “tree” and “forest.” I downloaded the texts of each and searched for all references to “tree” and “forest.” In the Old Testament of the Bible, for example, I found 328 references to those terms and then categorized them into six groups, ordered to show which trees were used or viewed (practical use, adornment for temples, analogies to a deity, location markers). More than 50% of the references described the use of trees for symbolic, aesthetic, and practical purposes (“He offered sacrifices and burned incense . . . under every spreading tree.”). About 20% of the references used trees as an analogy to life and

5. M. E. Tucker and J. Grim, “The greening of the world's religions,” *Chronicle of Higher Education* (2007), 53: 23.

6. L. Goodstein, “Evangelical Leaders Join Global Warming Initiative,” *New York Times*, February 8, 2006.

God (“Like an apple tree among the trees of the forest is my lover among the young men.”). Only 3% of the references describe aspects of tree biology, ecology or physiology (“So it towered higher than all the trees of the field; its boughs increased and its branches grew long spreading because of abundant waters.”).

I also found that trees in the other major world religions have spiritual and symbolic importance. In holy writings, plants, and especially trees, are often seen as symbols or manifestations of divine knowledge. They have the power to bestow eternal life or renew the life force. One example is Buddha’s enlightenment under the Bodhi tree. In Egypt, the gods sit in a tall sycamore known as the tree of life, and in Indian mythology there is a tree in heaven that provides a life-giving drink called ‘soma’ to Yama and the other gods. The Jewish Talmud says “. . .and the Lord God planted a Garden in Eden, and so you, too, when you come to Israel, shall do nothing before you have planted. . . .” And as early as the second chapter of Genesis of the Bible, trees and forests are portrayed aesthetically, practically, and symbolically: “the Lord God made to grow every tree that is pleasant to the sight and good for food, the tree of life also in the midst of the garden, and the tree of the knowledge of good and evil. . . .”

Although there were no references to what ecologists refer to as “ecosystem services” that trees provide, the scriptures stated the equivalent. Trees are not only inextricably tied into human needs—for food, shade, wood, rituals, ornamentation—but are at the base of what is most spiritual. Trees are symbols—analogs to god, and to that which is holy—and are used to help humans understand what is basic about life.

I compiled these findings into a sermon, titled “Trees and Spirituality.” I integrated results into three topics: (1) trees as fulfillers of the needs of followers, (2) how trees connect humans to the divine, and (3) ways in which humans incorporate trees into spiritual practices. I then focused on the connections that have the strongest bearings on the particular faith. Finally, I discussed actions that we might take as a result of heightened awareness, and invited later discussions.

Because I was new to the world of formal religion, I had to acquaint myself with the settings, customs, behaviors, and tone of places of worship. I could not make assumptions about how communication works in churches based on my experiences in academia. So I first simply attended and listened to a wide range of places of worship in the Pacific Northwest. I noted when and where services were offered by looking at the Faith section of my local newspaper and visited a different church or synagogue each weekend. I dressed up, sat in the back pew, listened, watched, and responded, taking my cues from regular congregants. I noted that sermons were only 20 minutes long (in contrast to a typical 50-minute academic lecture); that people were attentive and followed instructions, and that a donation basket was passed to show gratitude and contribution. Most importantly, the people in the seats next to me, clearly a stranger, greeted me with a nod or “good morning,” and during the coffee hour after the service, engaged me in warm conversation. I learned that they talked

Trees are not only inextricably tied into human needs—for food, shade, wood, rituals, ornamentation—but are at the base of what is most spiritual. Trees are symbols—analogs to god, and to that which is holy—and are used to help humans understand what is basic about life.

about their children and vacations, not just religious topics. I got a sense of their feeling of community and trust and though I was an outsider, I was not entirely outside of it.

Invitations to the pulpit

After I had compiled my data, and learned something of protocols, I knocked on doors of different places of worship. I did not portray myself as somebody who belonged to that faith, because I don’t have a religious faith. I am the daughter of a Hindu and an Orthodox Jew, and I don’t believe in God myself. But being a believer was not necessary. Because I was drawing upon the Holy Scriptures of these different faiths and using that as my authority, I would be able to convey the importance of trees and forests through that rather than my own personal [religious] conviction. I didn’t feel that I was betraying myself as a scientist by trying to pretend I was a religious person. This posed a barrier when I began, because I was rightfully viewed as an outsider. However, I was able to draw upon the connection of a personal friend who was a long-time member of a Unitarian church. After I gave a sermon there, and they saw that I wasn’t trying to dissuade them from their own religious convictions, I was invited to other Unitarian churches. After those, I was invited to other Christian churches—Presbyterian, Episcopalian, and Catholic—and on to congregations of Jewish and Buddhist faiths.

My sermon began with an explanation that my own affinity for trees began when I was a child of a large and sometimes chaotic family. Trees were my refuge. They held me in their branches and reassured me that there are safe places in the world. I chose as my profession the study of forests and trained myself with the tools of science to come to a better understanding of how trees work and how they provide the innumerable functions for humans. They have since provided me with a livelihood that has brought me professional and personal fulfillment.

My sermons were flexible. If I gave a sermon to Baptists, for example, I would highlight the Christian, Bible-oriented references. If I gave a sermon to Buddhists, I would highlight Eastern religious texts. But I also emphasized the universality of these relationships between humans and trees, as they were manifested in all of the

holy scriptures. Trees are used as temple adornments, for eating, analogies to God, as place markers. Of the Hebrew Bible references to trees and forests, many are metaphorical references to God. For example, in the Song of Solomon, God is equated with an apple that is cherished because of its sweet fruit and its relationship to how people loved apples. There were references to certain trees, such as a tree of Mamre that described a location. That was very important to people because in the time of the Old Testament, the habitat was a desert, and the few trees in the landscape were actually location markers.

Responses from congregants

Congregants listened attentively, participated in discussions after the sermon, suggested texts and hymns that I had overlooked, and passed me on to other places of worship. Some continued conversations with me by telephone and e-mail. I drew upon my scientific knowledge and sources to provide depth in my responses, which included scientific topics such as effects of climate change on trees, dynamics of insect outbreaks, and water relations of plants in biblical desert ecosystems, subjects that extend beyond spirituality and wildland preservation.

From these encounters, I learned that many religions give us thoughts about what we can do to help the earth. The Jewish tradition of Sabbath teaches its practitioners to consume less, to use less, to put a stop to our daily rounds. Shabbat (the day for rest in the Jewish religion) is not just for people. Nature gets a rest as well. Comparable with the cycle of rest for one of every seven days, there is a cycle of resting the fields one year for every seven years, which is congruent with other traditional and modern prescriptions for sustainability of agricultural land. For Buddhists, teachers recommend exercises in selflessness. Practitioners are told to do something for others without seeking any reward or recognition, an activity called “secret virtue.” For example, one can volunteer time and skills for community service or planting trees, with no goal of getting anything in return in the relatively short-term time frame of a human life. I found that Jews celebrate the holiday of Tu B'Shvat, the New Year for the Trees, that Buddha found enlightenment under the Bo tree (*Ficus religiosa*), and that sacred groves in India, established centuries ago by Hindus who believed them to be homes of their deities, now preserve stands of rare trees.

Looking at the writing of other religions and hearing the responses of the congregations during discussions that followed my talks, I learned that trees are closely linked to a number of spiritual concepts: enlightenment, breathing, silence and stillness, time and dynamics of life, and the hidden spheres within each of us. Trees connect us to enlightenment. Their very form, with their roots in the soil and their foliage reaching toward the sun, reminds us of the connection between the earth and non-earth. The Indian poet, Rabindranath Tagore wrote that “trees are earth's endless efforts to speak to the listening heaven.” Their shape and form are ubiquitous; we see dendritic forms everywhere—in rivers, caves, blood vessels, lungs, family trees, and temple hierarchies. The most powerful moments of the services I attended were the moments of

Trees also help humans understand the passage of time: their concentric rings count the years. Nothing tells us about the passing of time more clearly than autumn colors or the tender green of emerging buds or the delicate filigree of snow on tiny twigs.

silence—the time between speaking and hymns. In the Buddhist faith, silence, *samantha*—stopping, calming, concentrating—is critical to spiritual development. This stillness is evident when we look up at a tree on a windless summer day. Trees are rooted in the ground and make no sounds; they epitomize *samantha*.

Trees also help humans understand the passage of time: their concentric rings count the years. Nothing tells us about the passing of time more clearly than autumn colors or the tender green of emerging buds or the delicate filigree of snow on tiny twigs. In the Gospel of Luke (21:30-33), cherished by Lutherans and other followers of the Christian faith, we learn through the parable of the fig tree that in the passage of time, the promise that God's words will be fulfilled:

And he spake to them a parable; Behold the fig tree, and all the trees. When they now shoot forth, ye see and know of your own selves that summer is now nigh at hand. So likewise ye, when ye see these things come to pass, know ye that the kingdom of God is nigh at hand. Verily I say unto you, This generation shall not pass away, till all be fulfilled. Heaven and earth shall pass away: but my words shall not pass away.

I concluded my talks in places of worship with a brief call for conservation. I pointed out that many humans are stirred to protect trees, and have established national, regional, and local groups to take political and societal action to save them. I urged the congregation to become aware of these organizations and have since received requests from listeners for more information on ways to take action. Drawing on my scientific expertise, I offered them further discussions after the sermon about climate change, deforestation, and the importance of forest canopies to sequester carbon. I brought handouts with me, which I did not distribute, but rather simply placed them where interested congregants could pick them up.

In the forty-plus sermons that I've given, there was never any conflict nor mention of controversy between creationism versus evolution. Instead, congregants would recite a verse about trees that I had missed or sang a hymn about trees that they sing. Each

response was about offering more information about the importance of trees to me. I found that to be such a welcome and open invitation to exchange.

Other pathways of exchange

This approach of trying to find common ground led to other activities. One of them concerned the natural history that occurs in the sacred ground provided by churches themselves. When we think, “What’s sacred about a church” we think about the crucifix on the front of the nave, the cabinet where the Torah is housed, or images of the twelve Stations of the Cross on the walls, or the altar where we place marigold flowers for a Hindu deity. All of those occupy interior space. But nearly all places of worship also protect exterior space, many of which support trees. In 2013, my students and I began approaching churches and saying to the clergy, “Could we map the trees in your churchyard and create booklets that would inform your congregants about the living things that you protect in your churchyards? You are fostering sacred ground, so the trees that live there are also in some ways sacred, and we would like to document that.”

We brought out our surveying tools and mapped every tree in the churchyard of St. Mark’s Episcopal Cathedral as well as the Unitarian Church, both in Salt Lake City. We created booklets for congregants that contained maps that showed the location of the trees in the churchyard, and listed biological information about each species of tree, as well as any verses that we found in Holy Scriptures that related to that particular species of tree. For example, in the Episcopal Cathedral in Salt Lake City, we mapped their locust trees, and noted that the fruit of the locust is what Saint John the Baptist ate while he was in the desert for forty days. Microorganisms in the roots of locust trees also transform nitrogen in the air to forms that help fertilize the surrounding soil.

The pamphlets led to a third way that we’ve been interacting with people of faith, started by an interaction in a Baptist Church. A congregant came to me after I gave the sermon in this church and said, “Dr. Nadkarni, could I get your email address please?” And I said, “You know, I’m not going to be a Baptist. It’s not really worth your time, even to contact me.” He said, “Oh no, I’m not trying to convert you. I would like to invite you to a tree planting that we do once a month in our city here.” I was amazed, because here was a faith-based group that was actually doing more in terms of conservation and carbon sequestration than I and my students had done on our campus.

So, in contrast to my assumption that I was being proselytized to, I was actually being invited to an activity that was already being organized by this faith-based group that I and my students could contribute to. I realized that I should not have assumed that tree conservation is restricted to me in my academic environment, but rather that there are faith-based groups that also have this idea of conservation. We may have different motivations, but the result is that we all placed seedlings in the ground that would not otherwise have been planted.

These efforts are examples of a much larger groundswell of

“Could we map the trees in your churchyard and create booklets that would inform your congregants about the living things that you protect in your churchyards? You are fostering sacred ground, so the trees that live there are also in some ways sacred, and we would like to document that.”

activities to bring science and religion closer. Many evangelical groups have aligned with environmental groups to care for nature by cleaning streams, planting trees, and advocating against over-consumption. In his book, *The Creation*⁷, eminent biologist E.O. Wilson articulates that humans must preserve the biodiversity of Earth, whether its creation is explained by the Big Bang theory over millennia or by the hand of God over seven days.

I have also communicated these positive experiences to other ecologists at our professional meetings and in peer-reviewed publications. I suggest that to find an initial contact to a particular church, they might enlist a member of a church or temple (perhaps the scientist him/herself) who can serve as a “reverse ambassador”. I advise them to remove overly complex terminology or jargon, but that bringing handouts that provide greater depth about their science is acceptable, leaving them to be picked up, rather than passing them out. I remind scientists to recognize their own limitations and welcome alternative interpretations, noting that they are only one of the experts in this setting. I remind them to treat the texts, objects, clothing, and settings they encounter with respect. Just as scientists expect visitors to treat laboratory equipment with care, so congregants expect a visitor to treat their relics with respect. When you ascend a church pulpit, show that you honor this as a sacrosanct place, steeped in the hallowed and the historical. Finally, I invite them to present information from different faiths to reinforce the universality of the spiritual importance of trees.

Reflections

The content of my sermons concerned trees, but nearly any aspect of ecology can serve as a springboard for scientists. Although I have published papers in ecological journals and spoken at numerous ecological conferences, I have encountered very few other scientists who have followed these models to create individual sermons or booklets for their local churches. There’s a real stigma within science in terms of engaging with religious communities, and a

7. E. O. Wilson, *The Creation: An Appeal to Save Life on Earth* (New York: W. W. Norton Company, 2010).

set of barriers exists, spoken or unspoken. However, I have been heartened at higher-level efforts to bring together scientists and faith-based groups, by the well-respected science organization, the AAAS and its Dialogue on Science, Ethics, and Religion (DoSER) program⁸. They support and implement workshops all over the country to guide scientists to effectively engage with clergy and congregants. The materials they create are aimed at scientific audiences, and effectively disarm prejudices that arise from both sides.

Thus, I come away from these activities with a general sense of optimism. Despite the pressures of human populations on forests, our unthinking consumption, and the existence of laws that favor those who exploit rather than sustain our resources, there is hope for our relationship with trees. We are taking nascent steps to live more sustainably with our fellow species. We are becoming aware of the importance of knowing more about the natural environment and teaching our children about those connections. Scientists are entering spiritual discussions, and those in institutions concerned with the spirit are listening to the warnings of scientists. These may be happening in only small pockets of the population, but they are happening.

By approaching other worlds outside of academia with the faith that we can collectively find common ground, we will find common ground. And from that, we will be able to share our science, our religious beliefs, our way of knowing, our worldview in new and vital ways with result of better care for the Earth we share, with all parties agreeing with Herman Hesse's statement, "*In the trees' highest boughs, the world rustles, their roots rest in infinity. Nothing is holier, nothing is more exemplary than a beautiful, strong tree.*"

Acknowledgments

I thank the John Simon Guggenheim Memorial Foundation and the National Geographic Society's Conservation Trust for initial support. I also thank Carol McKinley, Lon Freeman, and Ward Fletcher for providing opportunities to speak. I acknowledge The Evergreen State College for fostering a sense of interdisciplinary thinking that encouraged these activities. Craig Nesson and his colleagues at Wartburg Theological Seminary catalyzed and supported this paper. This work was partially supported by grants from the National Science Foundation (BIR 9975510, DEB 9974035). I am grateful to Wartburg Theological Seminary for providing a venue for this exchange.

By approaching other worlds outside of academia with the faith that we can collectively find common ground, we will find common ground. And from that, we will be able to share our science, our religious beliefs, our way of knowing, our worldview in new and vital ways with result of better care for the Earth we share.

8. AAAS Dialogue on Science, Ethics, and Religion, (in *Profiles in Science Engagement with Faith Communities*, R. Kline, R. O'Malley, Eds), (AAAS, 2020).