

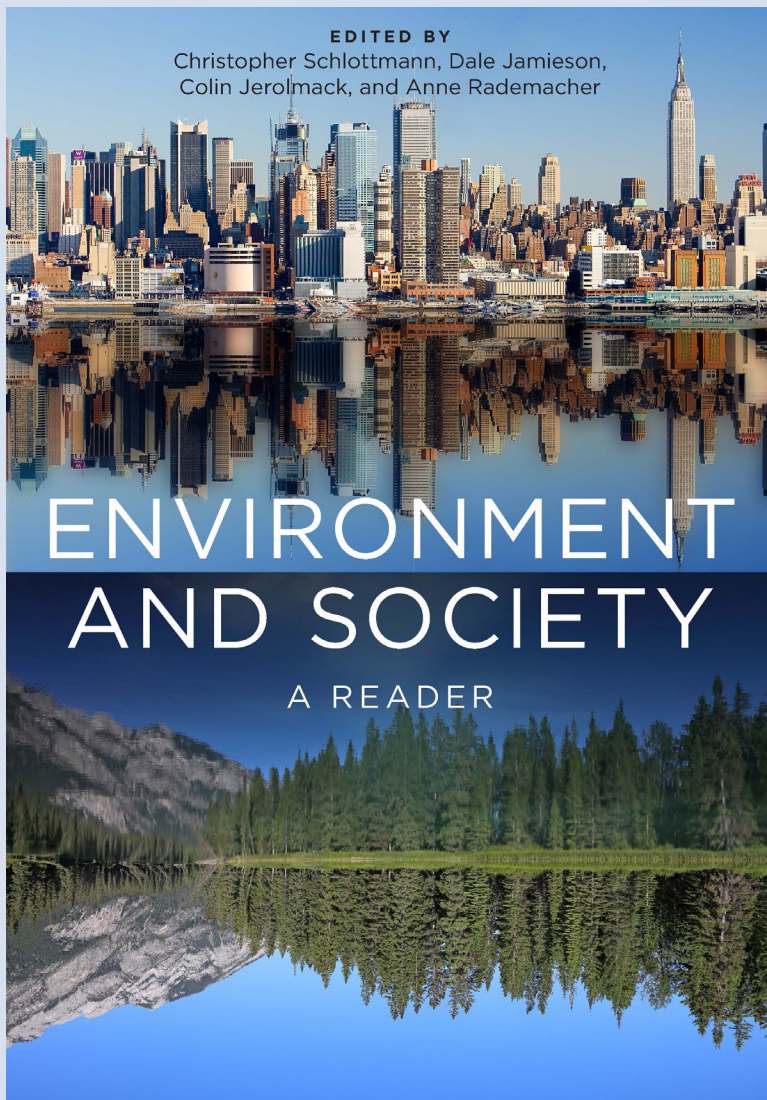
# Environment and Society

## A Reader

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### INSTRUCTOR'S GUIDE



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#### Why Consider this Book for Your Class?

- Promotes an analytical approach to understanding the environment and environmental movements
- Edited by experts in environmental studies with backgrounds in sociology, anthropology, economics and philosophy
- Features both canonical and contemporary selections
- Includes preface, introductions, notes, and further reading

"A thoughtful and diverse selection of key readings in environmental studies. This is **a valuable book for teachers, students, and anyone interested in environmental thought.**" —Richard York, co-author of *The Ecological Rift: Capitalism's War on the Earth*

## General Summary

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*Environment and Society* connects the core themes of environmental studies to the urgent issues and debates of the twenty-first century.

In an era marked by climate change, rapid urbanization, and resource scarcity, environmental studies has emerged as a crucial arena of study.

Assembling canonical and contemporary texts, this volume presents a systematic survey of concepts and issues central to the environment in society, such as: social mobilization on behalf of environmental objectives; the relationships between human population, economic growth and stresses on the planet's natural resources; debates about the relative effects of collective and individual action; and unequal distribution of the social costs of environmental degradation.

Organized around key themes, with each section featuring questions for debate and suggestions for further reading, the book introduces students to the history of environmental studies, and demonstrates how the field's interdisciplinary approach uniquely engages the essential issues of the present.

# I. IDEAS OF NATURE

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## SUMMARY

*Ideas of Nature* sets the table by challenging our conventional understanding of a seemingly basic idea of nature. Students are asked to explore various theoretical frameworks and historical narratives for understanding our current conceptions as well as the origins of the term “nature.” They are also asked to consider how it differs from “environment.” Everything around us is part of the environment, but not everything is part of nature. Nature refers to the physical world – the general realm of living plants and animals— and while we are undoubtedly a part of nature, human activity is often understood as a separate category, different from that of other natural phenomena. Throughout our evolution, farming, mining and other industrial and non-industrial activities have changed the landscapes around us, and many of these processes have come to be seen as “unnatural.” There is a difficult question to address here: is everything humans do unnatural?

This section aims to establish nature as a malleable idea, changing throughout the course of human interaction with and eventual dominance of our non-human surroundings. Reliance on concrete definitions in dictionaries often causes us to take for granted the historical journeys that everyday terms have taken. How did humanity begin to conceptualize nature as a separate force?

This section casts a spotlight on the changing discourse surrounding these topics. The language we use to talk about these things is relatively new, just as the ways in which we quantify and qualify “nature” have changed dramatically. It is crucial for students to imagine a time when “nature” was viewed as a brute enemy and equally important for them to picture the transition that reduced “nature” into consumable parts. How has our evolution permitted this? How have we gone from cautiously crossing rivers to harnessing their deep-water currents with turbines?

This section weaves together classic narratives about nature and religious interpretations of it with twenty-first century debates concerning the role that humanity has played in environmental change. It places reflective narratives from McKibben and Leopold side by side with scientific writing, such as Steffen and Crutzen’s analysis of the Anthropocene, in order to bridge early environmental philosophy with modern research. Next, the section explores religious interpretations of nature, and offers several ways to think about the earth. Merchant’s excerpt explores how the Garden of Eden mythology has shaped Western Culture and aided in the development of environmental awareness. Historical thought regarding the “loss of Eden” has often carried a recovery narrative, and Merchant

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uses generations of scientists and philosophers to question and criticize the quest to return nature to its pristine state.

The next texts dive into religious interpretations of nature and the non-human world. Writing from Pope Francis uses Christian teachings to argue for moral responsibility to care for “our common home,” while Gary Snyder employs Buddhist values to explain how humans should humbly view themselves as co-inhabitants of this planet.

Finally, this section aims to plant a seed for the vision of nature’s future. Once humanity no longer dominates, will nature re-establish itself, and how? Alan Weisman’s thought experiment helps us explore the ways in which nature would reclaim the planet, and questions the permanence of humanity’s impact. What did nature look like before humans, and what’s in store for it once we are gone? A visual aid may be helpful here. The German animated short film [Das Rad](#) tracks a rural area from ancient times through the present and into the future, showing its transformation from a rocky hillside into high-rise buildings through a time-lapse that represents geologic time.

The texts chosen for this section are meant to simultaneously embrace and challenge a variety of stereotypes about what we consider nature to be. Is nature confined to pristine wildlife preserves or camping grounds that require a permit? Or is nature a living, breathing force in our backyards, public parks and everyday streets? In this section, history, philosophy, science and religion come together to ground conceptions of nature and help understand how humanity has forged a relationship to it and with it.

## II. ENVIRONMENTALISM AND ENVIRONMENTAL MOVEMENTS

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### SUMMARY

This section follows the historical progression of the environmental movement from early preservationist philosophies based on aesthetic and spiritual values to contemporary urban planning, where environmental issues like pollution are addressed from a public health perspective.

What drove environmentalism and when did it first come about? Before students wet their feet with the initial texts in this section, take the temperature of your class by discussing possible motivations for an environmental movement. Consider the spectrum of reasons why people might become concerned about unregulated environments. Place issues of polluted drinking water and smog in conversation with aesthetic notions like extinctions of beloved fauna or the destruction of scenic landscapes. Were aesthetic reasons or health hazards more effective in driving the environmental movements? And what about economic opportunities – how does choosing to protect our surroundings ensure resources and financial stability over the long term? Conversely, how might it hinder economic development?

Influential figures Henry David Thoreau and John Muir are often credited with the rise of environmental thought in the 19th century. *Ideas of Nature* finished with a brief excerpt from Aldo Leopold, whose historical role in American environmentalism supplements Thoreau and Muir. Romantic themes about nature are explored and coupled with the lament of ecological degradation, and the bashing of urban living as the “source of society’s social ills.” Intrinsic values of nature are introduced in discussions of beautiful scenery, wild animals and the land. The preservationist philosophy that animated the first wave of environmentalism is covered here, and the conservationist rhetoric is given credit for political victories like the creation of National Parks.

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While it is already difficult to imagine the circumstances in which Thoreau and Muir cultivated their views, we must look back even further to truly understand the turnaround that has taken place. In what ways did the first European settlers in North America see nature as a threat? How did this fear bring about desire for domination, and cause today's scale of ecological destruction? How did this fear morph into a duty to protect?

We fast forward to the 1960's, to the landmark writing of marine biologist Rachel Carson. In her book *Silent Spring*, she warns about the dire environmental impact that comes with the indiscriminate use of pesticides. Technologies and industrial developments that flourished during the war were haphazardly employed in everyday society in an effort to create sweeping change. The widespread use of chemicals like DDT was intended to boost domestic productivity, but its carcinogenic properties were dangerously unknown to the public. Carson's controversial writing changed this pattern of blind faith in technology and contributed to the ban of DDT, as well as the significant political victories that followed, such as the creation of the EPA and the arrival of the Clean Water Act. Her scientific perspective coupled with an eloquent writing style sparked nationwide debate and created a role for chemists in the environmental movement. While Carson is certainly not the only female figure in environmental history, it is important to note the level of courage with which she took on the male-dominated world of science. Her excerpt in this section creates space for a gender-informed class discussion, and casts light on the underappreciated contribution of American women to conservation. What other women helped shape the environmental movement?

After covering essential figures that have dominated environmental literature for decades, this section takes a turn to critique the movement, its credited origins and its failure to diversify.

Nordhaus and Shellenberger offer a criticism of conventional environmental thought and propose a new paradigm of environmentalism. They argue that the "doom and gloom" narrative used by mainstream environmental groups is an unproductive scare tactic that fails to motivate the public. How has popular culture framed environmental issues. How has the fear of a coming catastrophe been used as a mobilizing tool? How has alarmist reporting failed?

In the fight to protect nature, it seems that the demonization of the economy and technological innovation have handicapped the ability to preserve the environment, and the apocalyptic predictions of environmentalists have left us feeling powerless instead of inspired. Nordhaus and Shellenberger urge us to adopt a new vision, where embracing technology and tapping into the human tale of overcoming

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can help us make true progress. Use what your students already know and ask them to recount technological accomplishments that have greased the wheels for environmentalism. A striking example is space exploration, where the breathtaking, satellite-captured “Blue Marble” image of Earth helped to recontextualize the role of humanity and inspire a generation of environmentalists.

Next, Gottlieb questions the credit that we have given to the aforementioned figures in this section. He takes us down a different path, where he spotlights the historical contributions of minorities and marginalized people to this global crusade. Social movements to eliminate industrial and occupational hazards—resulting in better housing, closed sewers and safer working conditions—have paved the way for environmentalism just as much, if not more, than the writings of Muir, Thoreau and Carson. He warns us not to give popular white voices too much credit for a battle long fought by indigenous communities and people of color.

Environmentalism is often criticized as a “white man’s fight” and despite much recognition and reflection on this, the movement’s goal of diversification seems to continuously fail. Renowned sociologist Bullard explains why, and introduces the field of environmental justice. His writing details how people living in low-income neighborhoods see higher rates of environmental-induced illnesses than their wealthier counterparts, and argues that there is a need to merge environmentalism with social justice. When we advocate for the environment, we must tease out racial nuances in our history in order to make sure that the goals of our movement do not reproduce institutional discrimination and favor one demographic over another.

This section closes with examples from abroad that help explain why the inclusion of minorities in the environmental movement is increasingly important. Guha introduces the notion of “environmental imperialism” as the forceful imposition of Western environmentalism onto poor developing countries. Students are encouraged to question whether the industrialized world-driven preservation of Amazonian rainforests and the protection of charismatic species in Africa simply use the cloak of sustainability to retain safari tourism and other luxuries. Would it be more effective to target the unsustainable lifestyles of privileged societies, which emit the greatest amount of greenhouse gases? Question why the polar bear became a universal symbol for climate change.

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Lastly, Baviskar presents us with a case study in New Delhi, India, which helps us understand how environmental solutions can also provide uneven social impacts. She covers the destruction of homes to make way for urban parks, and the displacement of workers due to the closure of polluting factories. Now familiar with cases of social injustice where environmentally-induced illnesses primarily plague minorities, and preservation of resources disadvantages poor populations, students are forced to consider a third scenario: when sustainable urban planning hurts the population it is meant to help.



### III. POPULATION AND CONSUMPTION

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#### SUMMARY

It is easy to take for granted how quickly the human population has grown. Over the course of our evolution, the spread of humanity was often curbed by environmental factors, such as climate and resource availability. Today, previously uninhabitable areas have turned into thriving cities that are able to support large populations due to technological innovation. As you delve into this section with your students, consider life in extreme corners of the world- the Sahara desert, the middle of Siberia- and entertain recipes for survival in these places without the advent of modern technology.

An interesting case study is Phoenix, Arizona, which is considered one of the least sustainable cities in the world due to its landlocked position in the water-parched southwest United States. Its rate of development is straining the ecological capacity of the region, and the constant import of food, water and energy that this desert city relies on makes it an interesting case study. How has technology been used to overcome the limits of an arid environment? Are there cultural behaviors that threaten the sustainability of these places? Why might a continued era of obsessive lawn care be dangerous for cities like Phoenix?

The section opens with Thomas Malthus, an 18th century thinker and Anglican minister. While the classist theory presented in his writing was based on an analogy to rabbit population growth, Malthus's essay was one of the most influential pieces of writing in history. It had real world consequences too, playing a devastating role in the Irish Potato Famine of 1846. In Ireland, a large part of the population dependent on potatoes for sustenance starved when a fungal disease hit the crop. At this time, the head of the British government, Lord John Russell, exported other Irish produce to England and banned international food imports from entering Ireland, largely due to the Malthusian theory of a ceiling on human population due to the finite pool of natural resources. This meant lowering chances of survival and discouraging reproduction, but largely targeting the poor.

The point here is not to paint Malthus as a monster, but to critically examine a "laissez-faire" ideology that made projections based on faulty assumptions. There was some plausibility in his beliefs, especially the idea that imbalance between population and resources leads to crisis. However, case studies like the Irish Potato Famine show how human rights abuses and governmental negligence can arise from population control policies. There are also modern cases to consider, like China's one-child policy or India's sterilization campaign. What were the intended results? Were these policies successful? Were human rights violated in the process?

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More recent efforts to determine the planet's carrying capacity are also covered in this section, like the influential "Limits to Growth" model. Taylor and Buttel discuss the complexity of making computer simulations of exponential population growth with finite resources, and additional concepts of scale and socioeconomic dynamics may affect the results. In these cases, how can environmental science impact policy?

This section also features an article detailing renowned IPAT equation, which was one of the first attempts to quantify environmental degradation with the use of multiple factors. Prior to assigning this text, it may be useful to explore students' own attempts at constructing equations to quantify human impact on the environments. Zooming in on specific activities in certain regions, such as the logging industry in Pacific Northwest or the demand for fish in Japanese cuisine, can further ground these concepts of resource depletion and environmental impact. Once students are acquainted with familiar case studies, they are better able to conceptualize the global effects of continued resource consumption amidst a growing population.

While linear patterns are more simple to conceptualize, understanding the exponential rate at which the planet's population is growing may be a daunting task to those grateful to leave these terms behind in math.

What does it mean to grow exponentially? Consider that it took 200,000 years for the human population to reach 1 billion. In the past 200 years, however, we have climbed to 7 billion. Collect ideas on how this may have happened, and encourage students to investigate factors affecting growth rate. Consider the fastest growing countries to date, like Pakistan and India, and compare them to anomalies like Japan, where the population has been falling since 2004. Use what students may already know about these countries to quest for reasons behind these population changes. What plays a bigger role: fertility rates or life expectancy? What else should we consider: access to medical care, education, nutrition, income? The point is to understand how dynamic this process is, and set the stage for a discussion of natural resource consumption. How do changes in population affect the environment?

Sustainability and carrying capacity must also consider the role of equity, which Daily and Ehrlich help us explore in this section. We are asked to look past the commonly used indicator of socio-economic class, and consider new factors, like gender, age, geography and reproduction. How do these factors impact equality of opportunity, and how difficult is it to balance the scale in today's era of increasing material consumption?

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In order for developing countries to improve their economy and quality of life, should developed nations slash their emissions and make room for others to catch up? Many arguments have taken place about the fairness of such a proposition, and the tensions that arose during the 2009 Copenhagen Climate Conference is a great example to explore. Additionally, [NASA's emission simulator](#) is a good resource to visualize these problems, coupling a world map with a time lapse of carbon dioxide production. All in all, students are encouraged to develop sensitivity and understand why the limits-versus-technology debate must be expanded beyond questions of impact and begin to consider entitlement. This links back to readings in the previous section, which begged the question: environment for whom?

*Population and Consumption* also introduces sustainable design and the analytical thinking that helped develop this field. Chertow takes us through the origins of Industrial Ecology and explains how the industrial technology that the environmental movement so often criticizes can be harnessed to alleviate adverse impacts of consumption. Practical visionaries McDonough and Braungart discuss how reinvention of products, buildings and business practices can help sustain and even improve the planet's ecological vitality.

Maniates, however, offers a critique of sustainable development and argues that the idea of infinite technological potential rejects frugality and prevents us from questioning societal norms in the first place. These clashing views create space for a crucial debate among your students. Does a reliance on technology simply perpetuate unsustainable behavior?

The final piece in this section also questions the appeal of technological fixes to overcome limits and weaves the overlooked topic of biodiversity into the conversation. We may be able to reduce our impact, but does innovation lack an affinity for nonhuman nature? Consider how the creation of solar and wind farms may serve to decrease greenhouse gas emissions, but also harm some ecosystems. Is this acceptable? How can sustainable development consider matters of extinction?

## IV. PUBLIC GOODS AND COLLECTIVE ACTION

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### SUMMARY

*Public Goods and Collective Action* expands the discussion of natural resource consumption to consider the dynamics behind human cooperation. The psychology behind individual decision-making is explored here and shows how the depletion of a shared resource is inevitable when people act in their own interests. This section addresses the gaps in economic theory when it comes to “common pool” resources, and the resulting overuse and degradation of ecosystems despite good intentions. Students are also provided with case studies of communities that have been successful in managing shared resources. The readings featured here combine politics, economics, psychology and ethics to equip your class with an interdisciplinary understanding of resource management.

Hardin’s canonical 1968 article “The Tragedy of the Commons” opens this section. He cites the over-grazing of common land in Medieval Europe as a historical example of unrestrained self-interest. In the absence of regulation, seemingly rational decisions on an individual level accumulate to cause ecosystem collapse. As a tenet of environmental science, Hardin’s commons dilemma helps ground modern debates about resources like the atmosphere and groundwater. No country has exclusive ownership of these things. High levels of greenhouse gas emissions benefit some societies, while the increase of carbon dioxide melts glaciers and cause sea level rise for everyone. The practice of hydraulic fracturing creates revenue for gas companies and lowers bills for certain populations, but can contaminate groundwater for everyone living around the operation. Hardin’s closing argument recommends “mutual coercion, mutually agreed upon” as a solution, but the rest of the section helps explain why strict management by external authorities is not always feasible.

An interesting case study for students to explore is the North Pacific Gyre, a trash vortex in the middle of the ocean that is twice the size of Texas and estimated to weigh 7 million tons. Discuss the challenges in placing blame and the obstacles to regulating something like this on an international level. Who should regulate oceans?

Ostrom’s article challenges Hardin’s praise of property rights and regulation as cures for the commons dilemma. She guides us through cases of communities that equitably managed grazing lands, forests and fisheries without the help of external regulation. She sheds light on the human potential for cooperation, and questions whether unrestrained

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self-interest is truly ubiquitous. Social ties play an important role in common-pool resources, and the piece from Petzelka and Bell compares outcomes from two communities that share pastures and rangelands in southern Morocco. In their 2000 study, they found that both communities had management systems that seemed to mirror the successful examples described by Ostrom. However, one seemed to thrive while the other was noticeably fragile. The key difference here, they argued, was the sense of community and continuous reinforcement of societal ties. The article demonstrates that community relations are not static, and must constantly be tended to and protected just as any shared resource should be. Having read about successful policies in previous chapters, such as the Clean Water Act and the protection of national parks, students are asked to consider the place of community-driven solutions under the umbrella of external regulations.

On the flip side, it is also possible for successful local solutions to scale up into regional initiatives. Discuss with your students the ways in which cities can serve as laboratories for state or nation-wide initiatives. Consider plastic bag bans, which spread across several municipalities after initial success in a few places, or the public health measures pioneered by Mayor Bloomberg in New York (e.g, the smoking and trans-fat restrictions) which were adopted in other cities.

The section moves to pieces that challenge Hardin's rational choice framework, which assumes that individuals are narrowly motivated by their own economic self-interest. Being selfish can hurt others, but it doesn't always have to.

Van Vugt provides evidence that individuals have a fundamental awareness of how actions impact their surroundings, be it other individuals or the natural environment. He considers ways in which we can harness the deep human need to belong to social groups— and the consequent concern about one's reputation— in order to incentivize sustainable behavior. Discuss with your students the psychological motivations for companies to adopt green practices, like the appeal of a prestigious LEED certification. Van Vugt also suggests that we tap into the human thirst for information. Examples are energy efficiency ratings seen on appliances, or animal welfare ratings used by grocery chains like Whole Foods. Once people understand the contribution of their individual actions, he argues, they are more inclined to act in the interest of social welfare. Use this reading as an opportunity to discuss with your students the ways in which information can be an effective tool, but make sure question how corporations can use the human desire for information

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to manipulate consumer choice. Here, you can address how products labeled as “sustainable and efficient” can encourage increased consumption. Are green products truly sustainable? Take it one step further - how has the color green been used as an effective tool to market unsustainable products?

Building off of the Van Vugt piece on individual incentives, Hourdequin argues for the individual obligation to reduce personal greenhouse gas emissions, and explains why global environmental issues of climate change require more than political action. Here, students are challenged to dissolve the contrast between what is individual and collective, as seen in the previous readings.

This section closes with an economic challenge of Hardin’s framework, and an exploration of what has become known as “free market environmentalism.” Adler’s article considers a new approach to environmental protection, where government regulations are replaced with decentralized markets that reflect societal values of resource preservation.

*Public Goods and Collective Action* asks students to consider the roles of individuals, corporations and governments in addressing environmental problems. It questions whether human coordination and cooperation can lead to sustainable societal welfare, and provides case studies of failure, success and motivation.

## V. VALUES AND JUSTICE

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### SUMMARY

This section teases out ideas from the previous readings and brings them into conversation with environmental values. Students are confronted with questions of what and who deserves our consideration, and how our economies and political arenas may be poorly equipped to reflect our values. While it does not feature the full history of environmental ethics, this section is structured in a chronological manner to demonstrate the expansion of environmental values.

Thoreau's excerpt celebrates the ways in which the experience of "wildness," whether natural or domestic, can be a source of spiritual fulfillment. The influence of his writing is evident in contemporary trends, such as the increasing desire of people to grow produce in one's backyard, or the popularity of "living off the grid." Connecting to nature is no longer a rural pursuit, and has been expanded to include activities like hiking, trips to botanical gardens and even growing basil plants in one's kitchen. While Thoreau laments society's detachment from nature, he recognizes that there are diverse ways to reunite with it.

Remember that many of your students have had experiences with nature that have shaped their views towards the environment and likely landed them in your very class. It could've been a camping trip or fond childhood memories of a neighborhood park. Encouraging a few examples to be heard is an interesting way to demonstrate the diversity of ways to "connect to nature."

This section also provides an excerpt from Goodin that challenges the authenticity of human-made nature, and defends "deep green" values. Just as society will never value a poster print as much as the real Mona Lisa, Goodin argues that we must be weary of nature that has been "faked" or restored. Here, students must consider the ways in which disrupting natural processes may lead to an irreversible loss of pristine nature and what this means for society, both psychologically and in terms of biodiversity.

Both Thoreau and Goodin help illustrate how nature can be valued, and why it should be, but it is also important to consider the constraints standing in the way of acting on these values. Translating environmental degradation into economic language is difficult, which is why environmental effects remain largely unaccounted for in our society. Students should consider whether it is possible to attach monetary value to environmental goods and, if so, how. Revisit the differences between preservationist and conservationist thought - would they embrace using monetary terms to value nature?

## V. VALUES AND JUSTICE

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Many of the readings in this book have covered our responsibility to nature, to other species, and finally, to each other. However, we are yet to consider what we may owe to future generations. Passmore tackles the complexity of valuing persons who are not yet born, and extending our notions of preservation and conservation onto a distant future that we know little about. He grounds our responsibilities to the future with existing moral cases for posterity, asking us to consider the common ground between the breach of legal contracts and the values preached by Christianity.

Harking back to questions from the first section, *Ideas of Nature*, Holland explores whether the sublime beauty of a landscape is sufficient reason to protect it. As students have learned, the environmental movement encompasses a large spectrum of opinions, where individuals adamant about capping carbon emissions might endorse the destruction of an ecosystem to build solar farms. Holland helps us navigate the differences between “weak sustainability,” which believes that human capital can substitute natural capital, and “strong sustainability,” which rejects this interchangeability. An advocate of weak sustainability might argue that degradation of the ozone layer and tropical rainforests is justified by virtue of financial profits, while an advocate of strong sustainability would contend that no amount of money could replicate the unique, and often crucial, ways in which these ecosystems serve humanity. Survey your class – what are the diverse environments ethics floating amongst your students? Some views are bound to be more extreme than others, and it is interesting to place them in conversation with one another and find common ground.

The last reading in this section re-opens the discussion around environmental justice. How should environmental harms and benefits be distributed? Schlosberg traces the expansion of this idea into what has now become a powerful subfield of environmental studies. Hurricane Katrina is an important case to consider, where a natural disaster hit a particularly vulnerable region. The most dramatic effects of the storm were felt in the industrial strip between New Orleans and Baton Rouge, a largely African American area commonly known as “Cancer Alley” due to its history of environmental disparities. The bare-bone evacuation efforts for these people was due to a tragically deficient response from the state and federal government, and resulted in a 1,836-person death toll that many argue was largely avoidable. Additional examples include the placement of incinerators in poor neighborhoods or the concentrations of factory farms in low-income counties. See if your class has other examples to offer.



## V. VALUES AND JUSTICE

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On an international scale, the increasing amount of natural disasters displaces whole populations, who we now call “environmental refugees.” Schlosberg helps understand how our common modes of risk assessment, such as cost-benefit analysis, fail to consider discrimination and serve to perpetuate institutional racism. Even if policy can resolve these issues, Schlosberg argues that what lies ahead is the equally difficult task of weighing human, non-human animal and natural values.

*Values and Justice* introduces students to a variety of ethical frameworks in the field of environmental studies, and asks them to consider the capacity for environmental values to manifest in our society.

## VI. ENVIRONMENTAL CONTROVERSIES

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### SUMMARY

*Environmental Controversies* is divided into three parts in order to analyze active controversies in the field of Environmental Studies. First it considers the debate between urban and rural living. Next, it covers the cases for industrial and nonindustrial modes of agriculture. Last but not least, it addresses the role of technology in environmental problem solving.

Essentially, each part uses a different dilemma to delve into the greater quandary of whether humanity should address environmental concerns by welcoming the future and innovation with open arms or if it should remain skeptical of a technological fix and embrace the conventional.

#### *City and Country*

The first topic explored is the idea of density. There is tension between lifestyles offered in compact, efficient urbanization and those immersed in the wilderness.

Mass migration into cities results in a reliance on industry and a distancing from nature that Abbey argues is wrong. He believes that humanity requires wilderness for self-realization, and feels that our modern-day metropolis lacks this essential ingredient for survival. Owen disagrees, and explains why places like Manhattan are among the most efficient human habitats on earth. Although the density in urban living requires less contact with nonhuman nature, it may actually serve to protect resources. The overall carbon footprint of a city reliant on apartment living and public transportation may be less than that of a rural sprawl, where isolated homes need separate heating systems and driving is a daily endeavor. There are also views between the two. Weeds in city lots have the potential to offer glimpses of nature. In the readings offered here, students are encouraged to question their conception of what can be appreciated as nature, and whether life in a city serves to threaten or elevate our relationship to the natural.

#### *Agrarian and Industrial Agriculture*

Genetic engineering has emerged as a hot topic in our modern day society. People are constantly questioning the safety of this technology, especially when it comes to their food. Advocates, on the other hand, viciously defend the use of science to improve agriculture, arguing that our population growth demands it and citing Mendel to demonstrate that humans have a historical tendency to manipulate plant breeding.

## VI. ENVIRONMENTAL CONTROVERSIES

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In the first piece, Borlaug takes the latter view. He defends the Green Revolution and praises our modern agricultural toolkit. He takes a humanitarian stance, and argues that the use of industrial pesticides, fertilizers and advanced breeding are necessary to address famine in a rapidly growing population. Because a shortage of food would lead to mass starvation, the environmental consequences of these technologies must be considered in the grand scheme of things, and we must opt for the path that favors greater rates of survival. Berry is rather skeptical of industrial techniques in agriculture, and criticizes the rise of corporate power and centralization of government that paved way for our current food system. He defends traditional, place-based approaches to farming, and believes that there is a certain value in, and knowledge of, a piece of land that has been passed down through multiple generations.

While the readings in this part offer clashing views on the “industrial” element of agriculture, it is important for students to avoid falling into the trap of an anti-industrial ideal. Many popular culture and literary depictions of agricultural problems have treated industrial approaches as inherently harmful to nature or indiscriminately impact-heavy on the environment. This narrative is overly simplified, especially since the majority of environmental impacts that are attributed to agriculture come from animal agriculture. Whether industrial or not, animal production leads to significant environmental degradation. Both organic farms and factory farms rely on grazing land for animals, as well as large supplies of grain to feed them. This pattern of land use and production of feed crops contributes to a system that yields carbon dioxide, methane and nitrous oxide emissions, and poor methods of waste management. As such, it is problematic to rely on the common industrial/non-industrial distinction as a reliable indicator of environmental impact.

Allow your students to debate the place of technology in agriculture. Create a space for the discussion of harmful and beneficial industrial advents. Mention how the use of fertilizers and pesticides, which often receives criticism, relies on the same level of technology as do vertical farms and compost operations, which are applauded as environmentally-friendly practices.

### *Managing Nature versus Stewardship*

Here, students are forced to question whether stepping back and letting nature resume its course is an acceptable solution to the environmental issues we face today. Should we simply cut down on our consumption, go easy on the resource depletion, and hope for nature to take the wheel?

## VI. ENVIRONMENTAL CONTROVERSIES

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Allenby argues that it's too late for that. Echoing Steffen's notion of the Anthropocene, which we read about in *Environmentalism and Environmental Movements*, he claims that our traditional notion of nature is obsolete, as human activity has replaced it and become the dominant force influencing our environment. The Earth, he argues, is a human artifact. It has become the design of a single species, our own. He defends the human engineering of natural systems, such as elemental cycles (including carbon and nitrogen cycles) and oceanic systems. According to Allenby, we must take responsibility for the damage we have caused, and use engineering to minimize the risk of natural disasters and global warming.

Keith disagrees with Allenby. After all, we cannot ignore the relatively un-impacted landscapes that we have to date. There are still mountain ranges, tropical rainforests and coral reefs that have aesthetic value, and we should do everything in our power to protect them. He believes that engineering and clever management of our surroundings cannot replicate what will be lost. We should be stewards of what already exists and protect it from further damage, rather than managers blindly seeking a technological solution for every environmental issue.

Must we respect nature as it is and halt our depletion of its resources? Or can we continue business as usual if we engineer ways to mimic natural systems? Discuss with our students whether it is wise to develop geo-engineering technology for emergency deployment. What ethical implications would such an investment hold? If we reject this technology, how might we respond to the inevitable, and possibly fatal, perturbations of global climate change?