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Environmental Regulation

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Robert V. Percival
Robert F. Stanton Professor of Law
Director, Environmental Law Program
University of Maryland Carey School of Law

Christopher H. Schroeder
Charles S. Murphy Professor Emeritus of Law and Professor
Emeritus of Public Policy
Duke University School of Law

Alan S. Miller
Former GEF and Climate Change Coordinator
The International Finance Corporation

James P. Leape
Former Director General
World Wildlife Fund International

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To my family, Barbara, Marita, Richard, and Zoey.

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To Kate, Emily, Ted, and Lily, and to my parents, Jane and Herb, for their unqualified support and love.

C.H.S.

To Sue, Joanna, and my parents, Ruth and Ralph Miller.

A.S.M.

To Suki, Benjamin, and Jonathan.

J.P.L.

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PREFACE

Public concern for the environment has been a catalyst for profound changes in American law. During the past half century, environmental law has grown from sparse common law roots into a vast system of public law that lies at the heart of the modern regulatory state. Environmental law has generated an immense and fiercely complex web of regulations that affects the way we live, work, and do business. Environmental regulation has profoundly affected so many other areas of legal practice, including real estate and commercial transactions, corporate law, criminal law, torts, contract law, and bankruptcy. This book seeks to provide a comprehensive introduction to environmental law.

The ninth edition of this book goes to press after more than a year of turmoil due to profound public health, environmental and economic crises. The deadly COVID-19 pandemic has infected more than one hundred million people in every corner of the world, killing millions. The severity of the global climate crisis has become even more apparent with wildfires, storms, and coastal flooding unprecedented in severity. Efforts to slow the spread of infection have shrunk economies and caused unemployment to soar to levels not seen since the Great Depression. The pandemic's disproportionate impacts on people of color, combined with a cascade of public concern for racial justice, have made issues of environmental justice more important than ever.

But there are profound signs of hope. The development of COVID-19 vaccines in record time has slowed the spread of the disease and help start an economic revival. Fossil fuel companies that long fought climate action are now telling a skeptical public that they will change their ways. A U.S. president who waged a relentless campaign against the environment was decisively defeated at the ballot box. Hours after taking office in January 2021 a new president committed to environmental justice and climate action rejoined the Paris Climate Accord and repealed a host of his predecessor's anti-environmental actions. Thus, this new edition of the casebook appears at a particularly eventful time in the development of environmental law.

The first edition of this casebook appeared nearly three decades ago. Subsequent editions repeatedly added new material to keep pace with developments in the field. The end product was a book that repeatedly grew in size with layers of new material that became somewhat unwieldy. With the ninth edition it was time to take a fresh look at the casebook, to pare down dated material, and to focus on the essentials. Thus, the 9th edition is more user friendly and compact even as it comprehensively updates material in the casebook. Previous adopters will be pleased that this was accomplished while retaining the same basic structure as the 8th edition.

The authors particularly would like to thank Professors Carmen Gonzalez, Helen Kang, Amy Sinden, and Cliff Villa, for their very helpful suggestions

concerning how to incorporate more materials on environmental justice throughout the casebook. This edition of the casebook places more emphasis on environmental justice issues than in previous editions, just as the Biden administration is making such issues a top priority. As in the previous editions, the text seeks to broaden students' vision by inviting them to explore how law relates to the larger problems society seeks to solve through collective action. It approaches environmental law through a regulatory policy focus that explores the full range of forces that shape the way law affects human behavior. By focusing on regulation—viewed expansively as embracing all forms of collective action to protect the environment—the text seeks to enhance understanding of the way law affects the behavior of institutions and individuals. This requires far more than mastery of "black letter" law; it also demands an appreciation of the complex processes by which political, economic, and ethical concerns shape regulatory policy. Thus, the text consistently focuses not only on the substance of environmental statutes, but also on how they are translated into regulations and on the factors that affect how they influence real-world behavior.

Despite its comprehensiveness, the book seeks at every turn to make environmental law and policy accessible to the non-specialist. Among the key features it employs to accomplish this goal are charts and diagrams mapping the structure of each of the major environmental statutes, problems and questions based largely on real-world environmental controversies, "pathfinders" explaining where to find crucial source materials for every major subject area, an extensive glossary of environmental terms, and a list of environmental acronyms. The casebook's website is located at a site whose URL is easy to remember because it is the acronym for *Environmental Regulation: Law, Science & Policy*: *www.erlsp.com*. The site will provide chapter-by-chapter updates of material in the casebook and links to the rich array of environmental information available through the Internet. Each year a statutory and case supplement to the text is published (*Environmental Law: Statutory and Case Supplement*), which provides both the updated text of the principal environmental statutes and recent judicial decisions in the field.

The chapters are organized in a manner that gives teachers considerable flexibility in deciding what to cover and in what order. Because each chapter is designed to be self-contained, the material may be covered in a variety of sequences, depending on the length of the course and the teacher's desired areas of emphasis. The teacher's manual identifies several alternative coverage options.

The authors appreciate the numerous comments received from faculty and students who have used previous editions of this text. These comments and suggestions have been invaluable in helping us improve the ninth edition, as we hope you will notice. We hope you will continue to give us such useful feedback on this edition as well.

Robert V. Percival
Christopher H. Schroeder
Alan S. Miller
James P. Leape

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Chapter 1

Environmental Values and Policies: An Introduction

> All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. The land ethic simply enlarges the boundaries of the community to include soils, waters, plants and animals, or collectively the land. . . .
>
> A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise.
>
> —*Aldo Leopold*

> I urgently appeal, then, for a new dialogue about how we are shaping the future of our planet. . . . We can no longer speak of sustainable development apart from intergenerational solidarity. Once we start to think about the kind of world we are leaving to future generations, we look at things differently; we realize that the world is a gift which we have freely received and must share with others. Since the world has been given to us, we can no longer view reality in a purely utilitarian way, in which efficiency and productivity are entirely geared to our individual benefit. Intergenerational solidarity is not optional, but rather a basic question of justice, since the world we have received also belongs to those who will follow us.
>
> —*Pope Francis*

The desire to ensure that present and future generations enjoy the benefits of both a prosperous economy and a healthy environment has become a universal aspiration that can provide common ground between remarkably diverse interests. The path for achieving this goal is often referred to as "sustainable development," a concept that has broad public support, despite sharp disagreements over specific policies for pursuing it.

Since the late 1960s, spectacular growth in public concern for the environment has had a profound impact on the development of American law. During this period, U.S. environmental law has grown from a sparse set of common law precedents and local ordinances to encompass a vast body of state and federal legislation. Numerous federal and state agencies now implement these laws through complex regulations that affect virtually every aspect of our lives. In addition, as environmental concerns increasingly transcend national boundaries, environmental law has now become an urgent priority around the globe.

U.S. environmental law has roots in many traditional fields of law, including torts, property, and constitutional law. Much of its continued evolution has been a response to perceived deficiencies of the common law as a vehicle for responding to new problems and new knowledge about the environmental effects of human activity. Chapter 2 explores the major sources of environmental law and provides an overview of the contemporary structure of the field. Throughout its development, environmental law has faced continual criticisms for not changing quickly enough. Such criticism comes both from those who think environmental law responds too weakly and too slowly to environmental problems as well as from those who think its requirements are unnecessarily burdensome and restrictive, forcing the public and private sectors to devote resources to problems that are either imaginary or overstated.

The United States and the world are now at a crucial moment in the development of environmental law and public health protection policy. In 2015 the Worldwatch Institute warned of the increasing threat that, as "human activities disrupt ecological systems worldwide, . . . infectious disease will spread from animals to humans." Worldwatch Institute, *State of the World 2015*, at 16 (2015). This phenomenon is known as zoonosis, and the diseases it spawns can be deadly. Emerging zoonotic diseases then included Ebola and the coronavirus that produced severe acute respiratory syndrome (SARS). The Worldwatch report noted that "despite rising attention to high-profile pandemics like Ebola, neither governments nor publics appreciate that such outbreaks are emblematic of a systemic, global problem." This warning proved prescient. The COVID-19 pandemic, believed to have originated in animal to human transmission in China, swept the world in 2020 and 2021. In little more than a year it infected more than 160 million people in virtually every country in the world, causing more than three million deaths. The United States, which has less than 4.3 percent of the world's population, accounted for one-fifth of global COVID-19 infections and one-sixth of all deaths. Johns Hopkins Coronavirus Resource Center, *https://coronavirus.jhu.edu/map.html*. These deaths and the enormous economic toll of lockdowns to combat the virus were disproportionately concentrated among the poor, minorities, the elderly, and those exposed to higher levels of pollution.

The global pandemic occurred even as the devasting effects of the climate crisis have become shockingly apparent. During the summer of 2020 several parts of the world experienced all-time record temperatures above 50 degrees Celsius (122 degrees Fahrenheit). In 2020 Death Valley, California established a global temperature record of 130 degrees Fahrenheit. Devastating wildfires, unprecedented in number and scope, swept through the western United States in 2020 after devastating Australia during its summer six months before. Unusually extreme weather phenomena, including fire tornadoes, appeared, and the melting of the Greenland and Antarctica ice caps accelerated, hastening sea level rise. As of 2020, the ten warmest years on record have all occurred since 1998, and 9 of the 10 have occurred since 2005. The Centers for Disease Control and Prevention (CDC) notes that due to climate change some "existing health threats will intensify and new health threats will emerge." CDC, Climate Effects on Health, *https://www.cdc.gov/climateandhealth/effects/default.htm* (2020). By disrupting physical, biological, and ecological systems, climate change can produce "increased respiratory and

cardiovascular disease, injuries and premature deaths related to extreme weather events," as well as "changes in the prevalence and geographical distribution of food- and water-borne illnesses and other infectious diseases." Id.

The climate crisis poses daunting challenges because it is inextricably linked to the carbon fuel cycle on which the economies of the world depend. Even as we continue to grapple with long-standing problems of ground-level air pollution, toxic waste generation, and water pollution, other problems have emerged. These include plastic pollution and ubiquitous contamination from toxic per- and polyfluoroalkyl substances (PFAS) that have eluded regulation for decades. Thus, environmental law faces two simultaneous problems. One involves reforming the tools at hand, to make them stronger and more effective. The other involves building structures, institutions, and rules sufficient for the more transformative demands of the climate crisis. This casebook explores the current regulatory instruments of environmental law and the criticisms that have been leveled against those instruments from different perspectives. It also examines the possibility that these instruments, while essential, have to be supplemented in significant ways if we are to meet the environmental demands of the twenty-first century.

This chapter begins by exploring some of the fundamental traditions of thought and attitude that form contemporary views regarding the environment. There is broad agreement that some forms of collective action are necessary to address some environmental problems. At the same time, the diversity of diagnoses about how environmental law needs to change intimates that there are also areas of fundamental disagreement about the concrete form such collective action should take.

A. ENVIRONMENTAL PROBLEMS AND PROGRESS

The domain of environmental law and policy extends to any place where the earth is modified by human action. Some of today's environmental problems have been around for centuries. Lead poisoning from wine goblets affected the Roman Empire. The Ancestral Pueblo peoples of the American Southwest intensively used and eventually depleted the natural resources of the mesas upon which they built their cliff dwellings.

Others are new. Synthetic organic compounds and nuclear power did not exist prior to World War II. Still others are old problems with new consequences caused by great increases in scale. In the past 50 years we have added more people and more pollutants to the planet than in the preceding 10,000 years. As just one illustration, the amount of carbon emissions from fossil fuel burning—a major contributor to the climate crisis—grew from practically nothing at the start of the Industrial Revolution to 500 million tons at the start of the twentieth century to 1.6 billion in 1950 and to nearly 10 billion in 2011. Ecologist Eugene F. Stoermer and Nobel prize–winning atmospheric chemist Paul Crutzen argue that human impact on Earth's ecosystems has been so extensive that we have entered a new geologic epoch that should be called the anthropocene. This epoch would signify a time when humans became the dominant influence on the planet's natural systems.

Some scientists believe the anthropocene should date from the Industrial Revolution of the late eighteenth century; others maintain that it should start much earlier, with the rise of human agriculture.

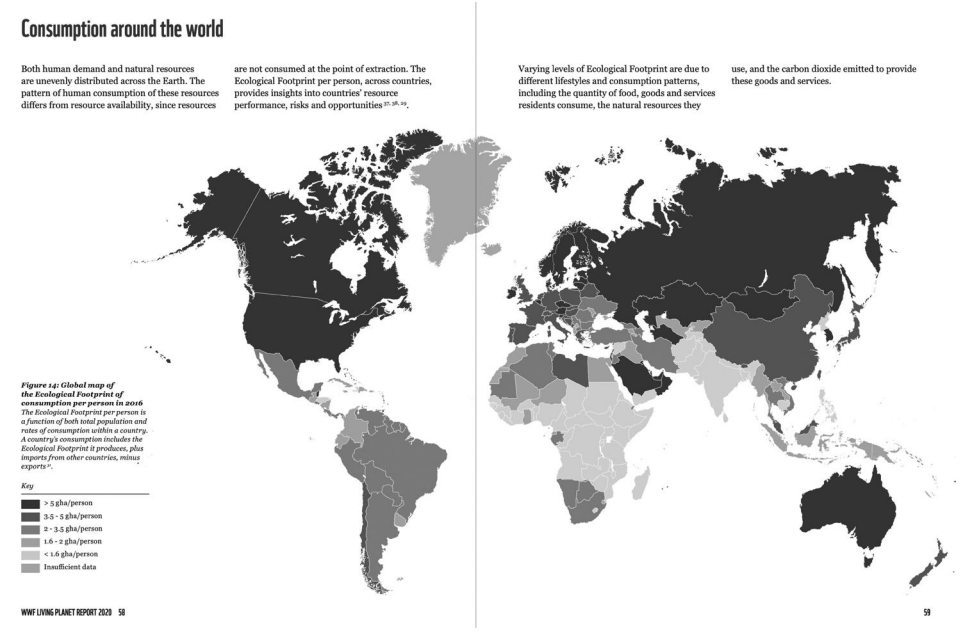
John Holdren and Paul Ehrlich are credited with first suggesting that the impact (I) that human behavior has on the environment results from the combined effect of population size (P), the level of affluence (A), and the type of technologies (T) that enhance our abilities to consume resources. Paul Ehrlich & John Holdren, Impact of Population Growth, 171 Science 1212-1217 (1971). This I = PAT formula ignores interdependencies and other complicating factors, but it does identify three significant elements that give rise to environmental issues.

Global population has increased from 3.85 billion in 1972 to 7.71 billion at the end of 2020, U.S. Census Bureau, U.S. and World Population Clocks, *http://www.census.gov/popclock*, and the United Nations Population Division estimates it is growing at the rate of 75 million people per year. Increases in population change land use patterns, consume more nonrenewable natural resources such as fossil fuels, intensify land uses such as agriculture, and produce more pollution. The group of individuals adversely affected by health-related environmental factors also increases as total population increases. For example, despite the fact that the percentage of the world's population served with water supplies that have been treated or improved grew from 79 percent in 1972 to 90 percent in 2015, hundreds of millions of people still lack access to safe drinking water and adequate sanitation. As a consequence, nearly 300,000 children under the age of five die every year from water, sanitation, and hygiene-related causes. Air pollution from particulate matter and ozone causes millions of premature deaths annually.

The impacts of technological change on the environment have been substantial. The automobile, which barely existed at the turn of the twentieth century, now contributes about one-third of global greenhouse gases and is a major source of some of the most harmful air pollutants. Technological improvements such as sonar and vast drift nets give fishing fleets the ability to wipe out ocean fisheries—a real concern in light of the fact that two-thirds of the world's marine fisheries are currently considered overexploited by the Food and Agriculture Organization of the United Nations (FAO). The development of plastics has facilitated growth in the throwaway economy, increasing per capita waste generation significantly.

The role of affluence can be illustrated through the idea of an Ecological Footprint. Developed by the World Wildlife Fund (WWF) and others, the Ecological Footprint provides a measure of the human pressures being placed on global ecosystems. It estimates how much productive land is required to produce food and wood, to build and maintain human infrastructure, and to absorb the carbon dioxide people generate from energy production, expressing that estimate in terms of a "global hectare," or a hectare of land with biological productivity equal to the global average. The per capita footprint for the United States was 7.19 in 2011 compared to 2.13 for China. Both figures then exceeded the global "break-even" standard of 1.78. WWF, 2012 Living Planet Report at 142, 144. By 2017 the U.S. footprint had increased to 8.0 and China's to 3.7. Global Footprint Network, data.footprintnetwork.org. Figure 1.1 maps the ecological footprints of each country.

Figure 1.1 Global Map of Ecological Footprint of Consumption



Source: World Wildlife Fund for Nature, Living Planet Report 2020 at 59 (2020).

Society and government have not been silent in the face of increasing human pressures on the global ecosystem. Since the early 1970s, national, international, state, and local governments have been responding to the increased human pressure on the environment in a wide variety of ways. At the international level, agreements and programs aimed at reducing adverse environmental impacts of human activity have proliferated. Beginning in 1972, a series of once-a-decade environment summits have provided a focal point for these efforts. These summits began with the United Nations Conference on the Human Environment in Stockholm in 1972 and now extend through to the United Nations Conference on Sustainable Development held in Rio de Janeiro in June 2012, also known as Rio+20 because it occurred 20 years after the Rio Earth Summit in 1992.

National and local environmental efforts have been equally impressive. Again, the early 1970s were a catalytic period, with the first Earth Day, April 22, 1970, symbolically marking the beginning of the modern environmental era. In the United States, a structure of national legislation sprang into place in a remarkably short period of time, and the Environmental Protection Agency (EPA) was established to administer many of the new laws and regulations. For an overview of these developments, see Mary Graham, The Morning After Earth Day (1999) and Richard J. Lazarus, The Making of Environmental Law (2004). Today, we have a complex array of rules and regulations aimed at mitigating adverse environmental effects, the implementation of which now annually costs the private sector hundreds of billions of dollars per year.

The world's policy responses have had positive effects. For example, air quality in the United States has generally improved, notwithstanding increases in population and Gross National Product. EPA reports that emissions of carbon monoxide,

60 percent of which come from automobiles, fell by 85 percent from 1980 to 2019, even though vehicle miles traveled increased by 94 percent during the same time period. EPA, Air Trends (*https://www.epa.gov/air-trends/carbon-monoxide-trends*). Controls on the use of lead additives have been even more successful: Emissions of lead fell 98 percent between 1981 and 2019. Internationally, global average life expectancy has been extended by more than ten years since 1972, with some of this improvement clearly due to reduction in environmental health risks.

The Ecological Footprint proves a helpful summary statistic for our current environmental situation. The good news is that the global per capita footprint is now growing at a slower rate than population growth—1.6 percent per year since 1985 versus 1.8 percent per year before then. We have begun, it would seem, to take steps to reduce the pressures that population growth puts on the global ecosystem. More disturbing, however, is news that the World Wildlife Fund and others believe that our present levels of use exceed the maximum footprint that the earth can sustain indefinitely. According to the WWF, we have been overshooting the capacity of the world to sustain existing population levels since 1980. "Through changes in technology and land management practices, biocapacity has increased about 28% in the past 60 years." But it has not kept pace with human consumption: "humanity's Ecological Footprint has increased about 173% over the same time period and now exceeds the planet's biocapacity by 56%." WWF, 2020 Living Planet Report, at 56. Continued ecological deficits of this kind will lead to a gradual depletion of the earth's capital stock and are inconsistent with the objective of sustainable development that is now embraced in one form or another by almost all environmental organizations.

The concept of "sustainable development" is widely embraced, but poorly defined. Worldwatch observed in 2015 that "we now find ourselves in a world of sustaina*babble*—marked by wildly proliferating claims of sustainability." State of the World 2015, at 4. In 2015 the United Nations adopted 17 Sustainable Development Goals (SDGs) as part of its 2030 Agenda for Sustainable Development. In 2019, the United Nations Environment Programme (UNEP) published its sixth edition of the Global Environmental Outlook (GEO6). The report assessed progress that had been made in addressing 93 environment-related indicators of the UN's Sustainable Development Goals. It found that good progress had been made over the last 15 years in responding to 22 of them. "For example, there has been an increase in terrestrial, mountain and marine protected areas; there has been an increase in the effort to combat invasive species; there has been significant progress towards renewable energy; there has been an increase in sustainability reporting and mainstreaming in policy; and there has been an increase in development assistance for climate change and the environment." But the report found negative trends with respect to indicators for forests, fisheries, endangered species, and materials consumption and a lack of data precluding an assessment of progress toward other SDG indicators.

In December 2020 UNEP reported that the nations of the world are not on track to meet even their weak initial nationally determined contributions (NDCs) to reducing greenhouse gas emissions (GHGs) pursuant to the Paris Agreement. UNEP Emissions Gap Report 2020, at xxi (2020). Thus, if current policies continue, global temperatures are likely to rise by at least 3 degrees Celsius by the end

of the century, which will have catastrophic consequences for the planet's environment. "Emissions from the richest 1 percent of the global population account for more than twice the combined share of the poorest 50 percent." Id. at xxv. The global COVID-19 pandemic has reduced the growth of global GHG emissions in the short-term, but it will not contribute significantly to emissions reductions by 2030 unless economic recovery policies emphasize strong decarbonization. "The state of the planet is broken," declares UN Secretary General Antonio Guterres. While the development of vaccines eventually may curb the COVID-19 pandemic, there is no vaccine for the damage global warming is causing.

But there are hopeful signs. A total of 126 countries, accounting for 51 percent of global GHG emissions, have announced net-zero GHG emissions goals by around mid-century. Japan has pledged to be net-zero by 2050, China by 2060, and President Biden is pursuing his campaign promise to make the United States net-zero by 2050. But to be credible these promises must be fleshed out by strong near-term policies and actions. Global oil prices have plummeted, placing the fossil fuel industry in an unprecedented decline, while renewable energy's prospects are brightening. In August 2019 the CEOs of 181 of America's largest corporations declared that corporations should serve not just their shareholders, but also their customers, employees, suppliers, and communities, including protecting "the environment by embracing sustainable practices across our businesses." Business Roundtable, Statement on the Purpose of a Corporation (2019), *https://opportunity.businessroundtable.org/ourcommitment/*. Whether this is "sustaina*babble*" or a true breakthrough remains to be seen.

Environmental problems share one or more of a set of characteristics that makes them important and difficult problems. Many involve potentially catastrophic and often irreversible adverse effects that can be spread across large areas, populations, and time periods in ways that make collective action to solve them essential. At the same time, there is great uncertainty about the mechanisms and effects of actions affecting the environment, so that debate over whether or not activities are actually causing substantial harm is often intense. There is also great resistance to actions aimed at solving them, sometimes because the economic costs are concentrated among a powerful few, sometimes because the costs involve lifestyle changes among the many.

There are reasons to think that further environmental progress will be increasingly difficult. For one thing, we have taken a number of steps that lay along the path of least resistance, going after obvious environmental problems where remedial steps were relatively manageable. Rivers literally on fire because of the oil and chemical film on their surface, lakes suffocating from massive algae blooms, dense clouds of smog over cities, and odors from open solid waste dumps cried out for attention. Improving environmental quality by picking off such "low-hanging" fruit was clearly the correct first step, but by and large the actions taken to redress such obvious problems have proven insufficient to bring the quality of our environment to where we wish it to be. Progress from here on confronts tougher problems.

In the United States, environmental policy has become an intensely partisan political issue unlike it was in the 1970s, when the major environmental laws passed Congress with wide bipartisan support. Although Congress in 2016 passed consensus legislation (the Frank Lautenberg Chemical Safety for the 21st Century Act) to

comprehensively overhaul regulation of toxic substances, such legislative compromises are extraordinarily rare. After the Trump administration took office in 2017 it aggressively pursued more than 125 regulatory changes to weaken environmental protection measures. Many of these actions were stymied in the courts, and the Biden administration is swiftly reversing many policies that caused substantial damage to the environment.

The increasingly partisan nature of environmental debate marks the current political landscape despite the fact that public opinion surveys throughout the modern environmental era have registered strong support for environmental protection. President Richard Nixon once described the environment as "a cause beyond party" and "a common cause of all the people of this country." Although a Pew Research Center report in February 2020 found rising support among the public for more aggressive government action to protect the environment and to respond to the climate crisis, only 21 percent of Republicans named it as a top priority compared to 78 percent of Democrats. Pew Research Center, As Economic Concerns Recede, Environmental Protection Rises on the Public's Policy Agency, *https://www.pewresearch.org/politics/2020/02/13/as-economic-concerns-recede-environmental-protection-rises-on-the-publics-policy-agenda/*.

Partisanship over the environment does not typically express itself as disagreement about whether or not environmental quality is an important goal. Instead, the battles over further environmental initiatives focus on whether they are effective, as well as whether or not they come at too high a cost to other values, including private property rights, economic growth, and individual freedom. The costs and benefits of environmentally damaging behavior frequently fall on quite distinct groups of people; the beneficiaries of a cement factory's production and profits are typically distinct from the downwind communities affected by the plant's air pollution, for example. Similarly, the costs and benefits of environmental improvements typically create different groups of winners and losers. This makes for difficult political decision making, especially as proposals for further improvement become more and more expensive.

B. ENVIRONMENTAL ETHICS AND VALUES

Humans interact with the world in two ways relevant to environmental policy. Their physical actions alter the world in measurable ways, and they also organize, categorize, and evaluate that world through the conceptual schemes and value perspectives they inhabit. This understanding of the role of values in interpreting the world suggests that terms like "adverse environmental impacts" and "environmental problems" are concepts constructed by and of human beings. Different value perspectives may construct a term differently, and hence different worldly phenomena may be included within it.

Indeed, American environmentalism comprises a mix of value systems, beliefs, and perspectives, and draws on a complex of historical, philosophical, and religious traditions. This diversity will not always be apparent. In the policy context, differences in perspective may often be masked from view by a shared consensus that a certain state of affairs deserves attention. After proposals to dam the Grand Canyon

surfaced in the 1960s, for example, opposition to the idea was waged on economic grounds, on conservationist grounds, on cultural-historical grounds, on Deep Ecological grounds, as well as others. Because consensus existed at the programmatic level of opposition to the dam, dissecting differences in the underlying rationale for that opposition was superfluous to the process of building a political coalition to fight the project; indeed, such dissection might actually inhibit such coalition-building.

Such consensus will not always exist, however. The economic perspective on environmental value, the conservationist perspective, and the Deep Ecological perspective strenuously disagree about the nature of the environmental problem posed by logging old-growth forest in the Pacific Northwest, for instance. Consensus among environmentalists often falls apart over the question of remedy: Should the country's response to toxic air pollutants consist of efforts to reduce emissions to their optimal level—the point at which further reduction costs more than the human health and welfare gains from such reduction—or should it consist of strategies aimed at achieving zero emissions, and if the latter, how quickly? Should animal experimentation be permitted when the information gained will serve human needs, only when it will serve vital human needs, or not at all? Remedial questions often expose underlying value disagreements because they press advocates to articulate their vision of a properly functioning economy or society. Many of the issues joined in this text can be better understood by seeing how different perspectives within environmentalism urge different solutions to problems.

Environmental values can be distinguished in many ways. One fundamental division separates perspectives depending on whether their main object of moral or ethical concern is humankind, living things (with a further division between approaches that place high value on all living things versus some smaller set of living things, such as all mammals or all animals capable of experiencing pain), or entire ecosystems. These are referred to as human-centered (or anthropocentric), bio-centered, and eco-centered, respectively. Economics supplies the human-centered perspective most influential in contemporary policy debates. The scientific discipline of ecology provides the intellectual framework for some of the most influential bio-centered and eco-centered approaches. We will return to each of these in more detail after canvassing the large landscape of values influencing environmental thinking today.

A great deal of writing about environmental philosophy views all human-centered approaches to ethics or morals as seriously insufficient. Some rule out classifying a human-centered ethic as an environmental ethic at all, preferring to reserve the latter name for any "ethic which holds that natural entities and/or states of affairs are intrinsically valuable, and thus deserve to be the object of our moral concern," irrespective of whether they are useful or valuable to us in meeting our needs. Thompson, A Refutation of Environmental Ethics, 12 Envtl. Ethics 147, 148 (1990). Defined this way, only bio-centered or eco-centered ethics qualify.

Consider, for example, Aldo Leopold's land ethic. Building on an understanding of humanity as but one part of a dynamic ecosystem, Leopold wrote that "a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." A. Leopold, A Sand County Almanac 201, 224-225 (1968). Much of Leopold's work was devoted to expressing the value of aspects of the environment that had no obvious economic value. "To sum up," he wrote, "a system of conservation based solely on economic self-interest

is hopelessly lopsided. It tends to ignore, and thus eventually to eliminate, many elements in the land community that lack commercial value, but that are (as far as we know) essential to its healthy functioning. It assumes, falsely, I think, that the economic parts of the biotic clock will function without the uneconomic parts." Id. at 213. Leopold plainly thought that polluting discharges may "tend otherwise" at levels well below those that are optimum from the economic perspective. For Leopoldians, the environmental problem of pollution can arise in situations in which the economic perspective would see no problem.

In particular, Leopold and other ecologists tend to believe that the scale of man's actions constitutes its most destructive quality. "The combined evidence of history and ecology seems to support one general deduction: the less violent the man-made changes, the greater the probability of successful readjustment in the [ecosystem]. Violence, in turn, varies with human population density; a dense population requires a more violent conversion. In this respect, North America has a better chance for permanence than Europe, if she can contrive to limit her density." Id. at 220. From the economic perspective, in contrast, large-scale disruptions of natural order are not necessarily to be avoided; it all depends on what costs and benefits to human beings are associated with those disruptions.

The science of ecology has had a growing influence on both human-centered and bio-centered systems of environmental values. The National Environmental Policy Act (NEPA)'s call for "systematic, interdisciplinary" analysis of "the profound impact of man's activity on the interrelationships of all components of the natural environment" is very much a call with ecological origins. Ecology's central orientation is to view "living organisms and this nonliving (abiotic) environment [as] inseparably interrelated and interact[ing] upon each other." E. Odum, Fundamentals of Ecology 10 (2d ed. 1959). Ecological study provides a warning that if humans want to retain the relatively hospitable surroundings the earth has so far provided, we must become much more cognizant of the ecological ramifications of our actions. Leopold's land ethic evolved from his reflections as an applied ecologist studying the diversity and resilience of local ecosystems.

Perhaps most significant, seen as a way of understanding the human-environment relationship, ecology serves as a unifying thread for a number of different biocentric and ecocentric points of view. Its stress on relationships among mutually dependent components lends itself to an emphasis on harmony and cooperation that a variety of perspectives have found congenial. Leopold's land ethic is the starting point for many contemporary efforts to develop a picture of ethical behavior that is not centered on humans. For an investigation of the land ethic's meaning and its influence, see Companion to A Sand County Almanac (J.B. Callicott ed., 1987).

Religious values also play significant roles in environmental perspectives. The relationship between Western religions and the environment has been particularly controversial. In 1967, Lynn White wrote an influential essay in which he argued that much of the blame for our current situation rests with the biblical account of the Creation, in which God set humankind apart from the rest of creation, gave men and women dominion over creation, and instructed them to subdue it. White, The Historical Roots of Our Ecological Crisis, 155 Science 1203 (Mar. 10, 1967). White's analysis was supported soon thereafter in John Passmore's Man's Responsibility for Nature (1974). For a detailed review of the emergence of the religious environmental movement, see Stephen Ellingson, To Care for Creation (2016).

Among the world's religions, the Judeo-Christian tradition has often seemed to fare the worst in terms of its alleged association with beliefs inhospitable to environmental protection. The dominion tradition, however, has been responded to by others who retrieve the biblical tradition of stewardship as a counterweight to the views of White and Passmore. In January 1990, for example, Pope John Paul II issued a message entitled "Peace with All Creation." In it he explained that alongside the arms race, regional conflicts, and domestic injustice, world peace is threatened "by a lack of due respect for nature, by the plundering of natural resources and by a progressive decline in the quality of life." Throughout the message, the Pope employed the vocabulary of ecology.

On June 18, 2015, Pope Francis issued an encyclical entitled *Laudato Si* (Praise Be to You) On Care for Our Common Home. The encyclical was published in eight languages. A copy in English is available online at *http://www.vatican.va/content/dam/francesco/pdf/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si_en.pdf*. The encyclical reviews the history of the Catholic Church's concern for the environment, noting Pope John XXIII's concern over the testing of nuclear weapons in 1963, Pope Paul IV's condemnation of environmental degradation in 1971, and statements of environmental concern by their successors. Declaring that God has entrusted the world to humans, Pope Francis states that nature is misused when it is viewed as property we use for ourselves alone. He notes that many religious traditions properly view activity that harms the environment as a sin. The Pope urgently appeals "for a new dialogue about how we are shaping the future of our planet."

Pope Francis argues that the most significant victims of environmental degradation are the poor, and he maintains that humans have a moral responsibility to protect the environment for future generations. He emphasizes that the climate crisis is an enormously serious problem, and he urges the nations of the world to reach a new global agreement to control emissions of greenhouse gases. In preparation for issuance of the encyclical, which is considered one of the most authoritative statements of Roman Catholic doctrine, the Vatican convened a summit meeting on the environment in April 2015 where then UN Secretary-General Ban Ki-moon delivered the keynote address. Consider the value perspectives reflected in the Pope's encyclical, reproduced in part below.

Pope Francis

Laudato Si — On Care for Our Common Home

(2015)

WHAT IS HAPPENING TO OUR COMMON HOME

I. Pollution and Climate Change

Climate as a Common Good

25. Climate change is a global problem with grave implications: environmental, social, economic, political and for the distribution of goods. It represents one of the principal challenges facing humanity in our day. Its worst impact will probably be felt by developing countries in coming decades. Many of the poor live in areas

particularly affected by phenomena related to warming, and their means of subsistence are largely dependent on natural reserves and ecosystemic services such as agriculture, fishing and forestry. They have no other financial activities or resources which can enable them to adapt to climate change or to face natural disasters, and their access to social services and protection is very limited. For example, changes in climate, to which animals and plants cannot adapt, lead them to migrate; this in turn affects the livelihood of the poor, who are then forced to leave their homes, with great uncertainty for their future and that of their children. There has been a tragic rise in the number of migrants seeking to flee from the growing poverty caused by environmental degradation. They are not recognized by international conventions as refugees; they bear the loss of the lives they have left behind, without enjoying any legal protection whatsoever. Sadly, there is widespread indifference to such suffering, which is even now taking place throughout our world. Our lack of response to these tragedies involving our brothers and sisters points to the loss of that sense of responsibility for our fellow men and women upon which all civil society is founded. . . .

V. Global Inequality

51. Inequity affects not only individuals but entire countries; it compels us to consider an ethics of international relations. A true "ecological debt" exists, particularly between the global north and south, connected to commercial imbalances with effects on the environment, and the disproportionate use of natural resources by certain countries over long periods of time. The export of raw materials to satisfy markets in the industrialized north has caused harm locally, as for example in mercury pollution in gold mining or sulphur dioxide pollution in copper mining. There is a pressing need to calculate the use of environmental space throughout the world for depositing gas residues which have been accumulating for two centuries and have created a situation which currently affects all the countries of the world. The warming caused by huge consumption on the part of some rich countries has repercussions on the poorest areas of the world, especially Africa, where a rise in temperature, together with drought, has proved devastating for farming. There is also the damage caused by the export of solid waste and toxic liquids to developing countries, and by the pollution produced by companies which operate in less developed countries in ways they could never do at home, in the countries in which they raise their capital: "We note that often the businesses which operate this way are multinationals. They do here what they would never do in developed countries or the so-called first world. Generally, after ceasing their activity and withdrawing, they leave behind great human and environmental liabilities such as unemployment, abandoned towns, the depletion of natural reserves, deforestation, the impoverishment of agriculture and local stock breeding, open pits, riven hills, polluted rivers and a handful of social works which are no longer sustainable." [Bishops of the Patagonia-Comahue Region (Argentina), Christmas Message (Dec. 2009), 2.]

INTEGRAL ECOLOGY

159. The notion of the common good also extends to future generations. The global economic crises have made painfully obvious the detrimental effects of disregarding our common destiny, which cannot exclude those who come after us.

We can no longer speak of sustainable development apart from intergenerational solidarity. Once we start to think about the kind of world we are leaving to future generations, we look at things differently; we realize that the world is a gift which we have freely received and must share with others. Since the world has been given to us, we can no longer view reality in a purely utilitarian way, in which efficiency and productivity are entirely geared to our individual benefit. Intergenerational solidarity is not optional, but rather a basic question of justice, since the world we have received also belongs to those who will follow us.

NOTES AND QUESTIONS

1. The gist of *Laudato Si* is that mankind has a strong moral obligation to protect the environment that has not been honored despite repeated global environmental summits. As a result we face an "ecological crisis" that particularly harms the poorest and most vulnerable. We must pursue intergenerational equity and hear "both the cry of the earth and the cry of the poor." The encyclical emphasizes "how everything is interconnected" and that various factors such as loss of freedom, violence, and corruption can undermine the effectiveness of legal institutions ("Laws may be well framed yet remain a dead letter. Can we hope, then, that in such cases, legislation and regulations dealing with the environment will really prove effective?"). The encyclical presents a solid discussion of the causes and consequences of climate change, and it stresses the importance of shifting away from highly polluting fossil fuel energy sources to renewable energy, something that has caused great distress to the fossil fuel industry and the climate deniers it promotes. It stresses that access to safe drinking water should be considered a fundamental human right, and it strongly emphasizes the importance of protecting wetlands and preserving biodiversity. Importantly, the encyclical declares that the biblical reference in the book of Genesis to man having "dominion" over the earth has been incorrectly interpreted to permit unbridled development ("the Bible has no place for a tyrannical anthropocentrism unconcerned for other creatures"). Rather, it argues that "our 'dominion' over the universe should be understood more properly in the sense of responsible stewardship" and that the right to private property is "not inviolable," but rather subject to a "social mortgage."

2. In other portions of *Laudato Si*, Pope Francis stresses the importance of developing effective national environmental laws and regulations ("Society, through non-governmental organizations and intermediate groups, must put pressure on governments to develop more rigorous regulations, procedures and controls. Unless citizens control political power — national, regional and municipal — it will not be possible to control damage to the environment."). He also notes the importance of continuity ("policies related to climate change and environmental protection cannot be altered with every change of government. Results take time and demand immediate outlays which may not produce tangible effects within any one government's term. That is why, in the absence of pressure from the public and from civic institutions, political authorities will always be reluctant to intervene, all the more when urgent needs must be met. To take up these responsibilities and the costs they entail, politicians will inevitably clash with the mindset of short-term gain and results which dominates present-day economics and politics.").

Pope Francis argues that laws, even when enforceable, will not alone bring about the necessary changes without ecological education that motivates individuals to change their behavior.

3. Pope Francis's encyclical was part of a diplomatic initiative by the Vatican to persuade other countries to reach a global agreement on measures to reduce greenhouse gas emissions. In December 2015, 195 nations signed the Paris Agreement establishing a new regime to govern global action to respond to the climate crisis.

4. What obligations for environmental protection do current humans owe to future generations? Does the concept of "sustainable development" imply that we must at least leave the natural environment in as good a shape as it is today?

5. The Pope's encyclical makes a powerful case that global warming and climate change will have the greatest impact on poor communities in developing countries that have played little or no role in creating the problems. Should developed countries compensate developing countries for the costs of responding to the climate crisis?

Preservationist Perspectives

Another distinctive value system whose influence you will see in American policy and law is that of the preservationist. Preservationists may emphasize historical continuity, within our culture, our traditions, and our relationships with the natural environment. They may, however, also demand the preservation of certain places because they provide the context and catalyst for contemporary revelation and self-understanding. "Why should we not also enjoy an original relation with the universe?" asks Emerson.

> Why should not we have a poetry and philosophy of insight and not of tradition, and a religion by revelation to us, and not the history of theirs? Embosomed for a season in nature, whose floods of life stream around and through us, and invite us, by the powers they supply, to action proportioned to nature, why should we grope among the dry bones of the past. . .? The sun shines today also. There is more wool and flax in the fields. There are new lands, new men, new thoughts. Let us demand our own works and law and worship.

Where are these insights found? By communing with nature itself, for "[u]ndoubtedly, we have no questions to ask which are unanswerable."

> We must trust the perfection of creation so far as to believe that whatever curiosity the order of things has awakened in our minds, the order to things can satisfy. . . . [N]ature is already, in its forms and tendencies, describing its own design. Let us interrogate the great apparition that shines so peacefully around us. Let us inquire, to what end is nature?. . . In the woods, we return to reason and faith. There I feel that nothing can befall me in life—no disgrace, no calamity (leaving me my eyes), which nature cannot repair. Standing on the bare ground—my head bathed by the blithe air and uplifted into infinite space—all mean egotism vanishes. I become a transparent eyeball; I am nothing; I see all; the current of the Universal Being circulates through me; I am part or parcel of God. [R.W.

Emerson, Nature (1836), reprinted in New World Metaphysics 171, 171-174 (G. Gunn ed., 1981).]

The writings of Emerson, Thoreau, and other Transcendentalists firmly graft into American literary history the connection between spiritual renewal and nature, so that one recurring argument for wilderness preservation urges doing so "because our lives and our conception of ourselves will be enhanced—in a spiritual sense—if we learn to appreciate [nature] for what it is and we learn how to live in harmony with it." J. Thompson, Preservation of Wilderness and the Good Life, in Environmental Philosophy (R. Elliot & A. Gare eds., 1983).

These thoughts may misleadingly suggest that preservationists are necessarily human-centered thinkers, valuing nature for what it provides for the human spirit. For many in this tradition, nature is to be valued first for itself; it then turns out that human contemplation of nature proves a source of inspiration as well. This biocentric idea is well expressed by the naturalist John Muir, founder of the Sierra Club:

> The world, as we are told, was made especially for man—a presumption not supported by the facts. . . . Now it never seems to occur to [many people]. . .that Nature's object in making animals and plants might possibly be first of all the happiness of each of them, not the creation of all for the happiness of one. Why should man value himself as more than a small part of the one great unit of creation?

Some argue that the kind of intrinsic value Muir attributes to nonhumankind supports the conclusion that those nonhumans possess rights that environmental policy ought to respect. David Brower, when he was chairman of the Sierra Club, expressed his agreement with Muir by announcing, "I believe in the rights of creatures other than man." However, animal rights advocates disagree over the precise source of those rights. Peter Singer and others argue for an animal welfare ethic, basing their views on the capacity of animals to experience pleasure and pain, and on that basis extending a human-centered ethic, Benthamite utilitarianism, to cover nonhuman species. See P. Singer, Animal Liberation (2d ed. 1990). Tom Regan, on the other hand, rejects the utilitarian approach and instead finds support for animal rights in the idea that living beings who have the capacity to experience life in certain qualitative ways (including having beliefs and desires, perceptions, memory, and a sense of the future) possess inherent value that gives them a right to respect, independent of the pleasures or pains they may experience. See T. Regan, The Case for Animal Rights (1983).

However wide the internal disagreements among these and other biocentered or eco-centered ethics, they remain distinguishable from economics and other human-centered views in that they seek to articulate "not an ethic for the *use* of the environment, a 'management ethic,' but an ethic *of the* environment." J.B. Callicott, The Case Against Moral Pluralism, 12 Envtl. Ethics 99, 99 (1990). Professor Callicott, a University Distinguished Research Professor at the University of North Texas, predicted in 2013 that as climate change becomes more apparent, people in the future will wonder, "What were they thinking back at the turn of the century driving those CO2-belching hunks of metal around, often just for the hell of it?"

Environmental Philosophy: A Pathfinder

For those wishing to explore more of the historical development and diversity of American environmental thought, see S.P. Hays, Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920 (1959); S. Udall, The Quiet Crisis (1963); R. Nash, Wilderness and the American Mind (1967); J. Petulla, American Environmental History (2d ed. 1988); R. Nash, The Rights of Nature (1989); P. Shabecoff, A Fierce Green Fire: The American Environmental Movement (1993); and E. Freyfogle, A Good That Transcends (2017).

A classic statement of the economic perspective on environmental issues is J.H. Dales, Pollution, Property, and Prices (1968). This perspective is also outlined in simplified form in W. Baxter, People or Penguins: The Case for Optimal Pollution (1974); R. Posner, The Economics of Law (1987); and A.M. Polinsky, An Introduction to Law and Economics (1983). Mark Sagoff has done some of the most interesting work critiquing the economic perspective on environmental issues. Much of his work is summarized in M. Sagoff, The Economy of the Earth (1988). J. Baird Callicott is the leading expositor of Leopold's land ethic. See his In Defense of the Land Ethic (1989) as well as his edited collection of essays, Companion to a Sand County Almanac: Interpretive and Critical Essays (1987).

Useful collections of essays in environmental philosophy include: D. Scherer ed., Upstream/Downstream: Issues in Environmental Ethics (1990); F. Ferre & P. Hartel eds., Ethics and Environmental Policy (1994); R. Attfield & A. Belsey eds., Philosophy and the Natural Environment (1994); M. Zimmerman et al., Environmental Philosophy (1998); M. Smith, Thinking Through the Environment (1989); S.M. Gardner & Allen Thomson, The Oxford Handbook of Environmental Ethics (2017). Bill McKibben's books stress the significance of the loss of nature on the human spirit as well as on nature itself. B. McKibben, The End of Nature (1990) and Enough (2004).

Many scholars have put forward their own approach to environmental philosophy. For good reviews and extensive bibliographies, see R. Attfield, The Ethics of Environmental Concern (2d ed. 1991); A. Dobson, Green Political Thought, chs. 1 & 2 (1998); N. Carter, The Politics of the Environment, ch. 2 (2001); Holmes Rolston III, A New Environmental Ethics (2d ed. 2020).

Much of the important literature in this field is contained in Environmental Ethics, a journal published quarterly by the Center for Environmental Philosophy at the University of North Texas. The journal's website can be found at *https://www.pdcnet.org/enviroethics*.

C. ENVIRONMENTAL JUSTICE

For four decades the environmental justice movement has challenged environmental policy to shift to a paradigm that would emphasize preventing vulnerable populations from being exposed to environmental risks, rather than simply managing, regulating, and distributing such risks. Connecting environmental

issues to a larger agenda of social justice, this movement focuses on the connections between discrimination, poverty, and the distribution of environmental risks. It argues that "low-income communities and communities of color bear a disproportionate burden of the nation's pollution problem" because the "environmental laws, regulations, and policies have not been applied fairly across all segments of the population." R. Bullard, Unequal Protection: Environmental Justice and Communities of Color xv (1994). In a relatively short period of time, environmental justice concerns emerged as major ethical considerations in modern environmentalism. An outpouring of global concern over racial justice following the senseless murder of George Floyd by police in Minneapolis in May 2020 has given renewed impetus to the environmental justice movement.

1. History of the Environmental Justice Movement

The historical roots of the environmental justice movement usually are traced to protests that arose in 1982 over the siting of a landfill for disposal of polychlorinated biphenyls (PCBs) in the poor community of Afton, North Carolina, a town with an 84 percent Black population in Warren County, North Carolina. Decrying "environmental racism," protesters laid down in a road to block delivery of 6,000 truckloads of PCB-contaminated soil. Although the protests failed to stop the disposal, they brought national attention to the disproportionate siting of hazardous waste disposal facilities in poor and minority communities. In 1983 the General Accounting Office (GAO) released a study finding that three out of every four major hazardous waste disposal facilities in the southeastern United States were located in poor communities with majority African American populations. GAO, Siting of Hazardous Waste Landfills and Their Correlation with Racial and Economic Status of Surrounding Communities, *https://www.gao.gov/assets/150/140159.pdf*. In 1987 the United Church of Christ Commission on Racial Justice released a report entitled *Toxic Wastes and Race* confirming the disproportionate concentration of hazardous waste disposal facilities in minority communities.

In March 1990 a group of more than 100 grassroots activists sent a letter to the leaders of the top ten national environmental groups arguing that "[r]acism is the root cause of your inaction around addressing environmental problems in our communities." Noting that very few people of color were on the staff of the environmental groups, the letter demanded that they cease fundraising and operations in communities of color until leaders from those communities "make up between 35-40 percent of your entire staff." Southwest Organizing Project, Letter to leaders of national environmental organizations, March 16, 1990.

In October 1991 the First National People of Color Environmental Leadership Summit was held in Washington, DC. Participants in this summit endorsed a set of 17 Principles of Environmental Justice that are reproduced below. In September 1992 the National Law Journal published an extensive study of EPA enforcement cases finding that penalties for violations of nearly every major federal environmental statute were much greater in white neighborhoods than in minority communities. Marianne Lavelle & Marcia Coyle, Unequal Protection—The Racial Divide in Environmental Law, Nat'l L. J. Sept. 21, 1992, at S1.

Studies of the causes of environmental justice problems showed that they involve far more than simply decisions concerning the siting of locally undesirable land uses (LULUs). A study analyzing census data from St. Louis metropolitan areas from 1970 to 1990 found that "[i]ndustrial facilities that were originally sited in white areas often became surrounded by minority residents who are attracted to these neighborhoods by falling housing prices." T. Lambert & C. Boerner, Environmental Inequity: Economic Causes, Economic Solutions, 14 Yale J. on Reg. 196, 197, 206-207 (1997). Others have found that a better predictor of LULU location than either race or class is the degree to which a local community is politically organized. Jay Hamilton, Politics and Social Costs: Estimating the Impact of Collective Action on Hazardous Waste Facilities, 24 RAND J. Econ. 101, 104-105 (1993).

In September 1993, EPA created a National Environmental Justice Advisory Council (NEJAC) to provide independent advice to the agency on environmental justice issues. In February 1994, President Bill Clinton issued Executive Order 12,898, requiring every federal agency to make "environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Each agency was required to develop an "agency-wide environmental justice strategy" to achieve these ends.

EPA has been widely criticized for its failure to implement Executive Order 12,898 as vigorously as it might. The Government Accountability Office concluded that EPA failed to take environmental justice considerations adequately into account when developing rules under the Clean Air Act. For instance, in developing a rule to reduce the sulfur content of gasoline, EPA analysis determined that pollution near oil refineries would be increased as a result of the rule, because the process of removing the sulfur generates some air emissions, while the amount of pollution being emitted by automobiles would be decreased. This raises potential environmental justice issues, because minority and low-income communities are disproportionately located near such facilities. Yet in responding to comments that raised this environmental justice concern, "specifically, EPA did not publish its estimate that potentially harmful emissions would increase in 26 of the 86 counties with refineries affected by the rule." GAO, EPA Should Devote More Attention to Environmental Justice When Developing Clean Air Rules, p. 4 (July 2005).

Executive Order 12,898 prompted all federal agencies to undertake a review of their internal decision-making procedures to incorporate consideration of environmental justice issues into those procedures, pursuant to guidance published by EPA's Environmental Justice Office in 1995. The Nuclear Regulatory Commission (NRC) was among the agencies who revised its procedures accordingly. (As an independent agency, the NRC is not directly covered by Executive Order 12,898, but it voluntarily promulgated an environmental justice strategy for internal decisions.)

A license application by Louisiana Energy Services (LES) to build a uranium enrichment plant in Homer, Louisiana, an almost entirely African-American town located in economically depressed northern Louisiana, provided a major test of the NRC's strategy. The draft environmental impact statement (EIS) for the application, issued prior to the executive order, did not include an analysis of environmental equity, but the final one, issued after the order, did. It

described the neighborhoods surrounding the proposed facility, the site selection process, possible discrimination, and possible disproportionate impacts. The EIS concluded that there was no evidence of discrimination and no significant disproportionate impacts.

In May 1997, the NRC's Atomic Safety and Licensing Board (ASLB) rejected LES's permit application on environmental justice grounds. The Board found that NRC staff had failed to comply with the executive order by conducting only a cursory review of the site selection process. On appeal, the full NRC Board agreed that NRC staff had failed to delve sufficiently into disparate impacts that might be caused by the new facility, but it rejected the ASLB's additional instructions to the staff to inquire into whether racial discrimination influenced the process, ruling that the National Environmental Policy Act was not a tool for addressing racial discrimination. LES subsequently abandoned its plans and terminated the licensing process.

The George W. Bush administration deemphasized environmental justice issues at the national level, but it did not repeal Executive Order 12,898. Many state and local governments adopted laws emulating the executive order by requiring decision makers to take environmental justice concerns into account when making permitting decisions. For example, Virginia law contains a Commonwealth Energy Policy designed to "[e]nsure that development of new, or expansion of existing, energy resources or facilities does not have a disproportionate adverse impact on economically disadvantaged or minority communities." Va. Code Ann. §67-102(A)(11). One of the "[e]nergy objectives" of the Commonwealth Energy Policy is to "[d]evelop[ ] energy resources and facilities in a manner that does not impose a disproportionate adverse impact on economically disadvantaged or minority communities." Id. §67-101(12). As discussed below, these provisions played a significant role in Friends of Buckingham v. State Air Pollution Control Board, 947 F.3d 68 (4th Cir. 2020), which rejected issuance of a permit for a pipeline compressor station in a Virginia community that is 84 percent non-white.

In 2004 the state of North Carolina completed detoxification of the PCB landfill in Warren County that had become an early symbol of the lack of class- and race-related justice in environmental policy. "State and federal sources spent $18 million to detoxify or neutralize contaminated soil stored at the Warren County PCB landfill. A private contractor hired by the state dug up and burned 81,500 tons of oil-laced soil in a kiln that reached more than 800 degrees Fahrenheit to remove the PCBs (polychlorinated biphenyls). The soil was put back in a football-size pit, re-covered to form a mound, graded, and seeded with grass." Robert Bullard, Environmental Racism PCB Landfill Finally Remedied But No Reparations for Residents, *https://blackcommentator.com/74/74_reprint_environmental_racism_pf.html*.

Subsequent studies repeatedly have confirmed the disproportionate exposure to environmental risks of low-income and minority communities. On the twentieth anniversary of its initial environmental justice report, the United Church of Christ performed a new study finding that 56 percent of the population living within 3 kilometers of a hazardous waste site are people of color, whereas minority communities make up only 30 percent of the population outside of these areas. Toxic Wastes and Race at Twenty 1987-2007, A Report Prepared for the United Church of Christ Justice & Witness Ministries.

EPA's 2008 Report on the Environment reported an infant mortality rate—considered to be a particularly useful measure of health status because it indicates both current health status of the population and predicts the health of the next generation—to be 14.0 in 2003 for Black infants and 6.8 for white infants. A number of other indicators reflect significant disparities, including rates of cancer, cardiovascular disease, asthma, birth defects, and levels of mercury and lead in the blood, all of which have some linkage to environmental contaminants. See EPA, Report on the Environment (2008).

National attention to environmental justice issues was renewed during the Obama administration, but it was marred by the Flint, Michigan lead poisoning scandal. For more than a year, from 2014 to 2015, impoverished residents of Flint, Michigan were drinking lead-laden tap water that poisoned their children. The Flint tragedy originated with the appointment by Michigan governor Rick Snyder of Darnell Earley as emergency manager for Flint. To save money, Earley decided in April 2014 to shift the source of the city's water supply to the polluted Flint River. Because Flint River water is highly corrosive, lead from pipes in Flint's water supply system leached into the drinking water, poisoning Flint residents. Shockingly, after test data revealed the lead contamination, state and federal officials failed to inform Flint residents. Officials initially denounced private groups who tried to publicize test results. Yet when General Motors complained that the water was corroding parts at a plant in Flint, government officials quietly reconnected the plant to its former water supply.

The Flint tragedy dramatically highlighted an environmental justice problem—environmental risks continue to be disproportionately concentrated in poor and minority communities. Flint is a majority African-American community with more than 40 percent of the population living below the poverty line. Government officials in Flint responded promptly to GM's complaints about the water, but its poor residents were not warned of the hazard.

Studies continue to confirm that other low-income and minority communities are disproportionately exposed to environmental risks. Using EPA data on air pollution, a study published in 2018 found significant disparities in exposure to the deadliest particulate air pollution—particulate matter of 2.5 micrometers in diameter (PM2.5). The study found that "those in poverty had 1.35 times higher burden [of exposure] than did the overall population, and non-Whites had 1.28 times higher burden. Blacks, specifically, had 1.54 times higher burden than did the overall population." Ihab Mikati, Disparities in Distribution of Particulate Matter Emission Sources by Race and Poverty Status, 108 Am. J. Public Health 480 (2018). These "disparities held not only nationally but within most states and counties as well." Exposure to PM2.5 is associated with respiratory and heart diseases, increasing the risk of premature death. Studies also are finding a relationship between exposure to such pollution and higher death rates from COVID-19.

Although President Trump did not repeal President Clinton's environmental justice executive order, he proposed to dismantle the agency's Office of Environmental Justice. In March 2017, Mustafa Ali, leader of this office, resigned in protest of the Trump administration's proposal, which Congress did not adopt. In November 2017 the NAACP and the Clean Air Task Force released a report finding that Blacks are 75 percent more likely than other Americans to live in "fence-line communities"

located in close proximity to oil and gas facilities. NAACP & Clean Air Task Force, Fumes Across the Fence Line (2018), *https://www.catf.us/wp-content/uploads/2017/11/CATF_Pub_FumesAcrossTheFenceLine.pdf*.

One of those fence-line communities is the Grays Ferry neighborhood of South Philadelphia, located near a massive 150-year-old oil refinery owned since 2012 by Philadelphia Energy Solutions (P.E.S.). Residents of the community experienced an unusual incidence of life-threatening health conditions, including gallbladder and other cancers. EPA data revealed that the refinery was responsible for "the bulk of toxic air emissions" in Philadelphia. The refinery was "out of compliance with the Clean Air Act nine of the past 12 quarters through 2019 with little recourse." Between 2014 and 2019, it was fined almost $650,000 for violating air, water, and waste-disposal rules. Linda Villarosa, Pollution Is Killing Black Americans. This Community Fought Back, N.Y. Times Magazine, July 28, 2020. On June 21, 2019, a series of explosions caused by corroded pipes set off massive fires at the P.E.S. refinery, releasing 5,000 pounds of deadly hydrofluoric acid. P.E.S. went bankrupt and was sold to a developer who plans to demolish the refinery despite efforts by Trump administration officials to have the refinery reopened.

On January 27, 2021, President Biden signed Executive Order 14,008, 86 Fed. Reg. 7619, which directs federal agencies to take an "all of government" approach to environmental justice. The order directs federal agencies to develop programs, policies, and activities to address the disproportionate health, environmental, economic, and climate impacts on disadvantaged communities. It establishes a White House Environmental Justice Interagency Council and a White House Environmental Justice Advisory Council to address current and historical environmental injustices. The order establishes a goal of delivering 40 percent of the overall benefits of relevant federal investments to disadvantaged communities. It also initiates the development of a Climate and Environmental Justice Screening Tool, building off EPA's EJSCREEN, to identify disadvantaged communities and inform equitable decision making across the federal government.

2. Principles of Environmental Justice

Initially EPA used the term "environmental equity" to refer to the notion that environmental risks should be equitably distributed across income and population groups. It later changed to "environmental justice," the term used in President Clinton's Executive Order 12,898. EPA's current definition of environmental justice is as follows: "Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." EPA defines "fair treatment" to mean that "no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies."

The concept of "meaningful involvement" was not contained in EPA's initial definition of environmental justice. After it was added, EPA explained that "meaningful involvement" means "[p]eople have an opportunity to participate in

decisions about activities that may affect their environment and/or health," that "[c]ommunity concerns will be considered in the decision-making process" and that "[t]he public's contribution can influence the regulatory agency's decision." EPA, Learn About Environmental Justice, *https://www.epa.gov/environmentaljustice/learn-about-environmental-justice*.

Participants in the First National People of Color Environmental Leadership Summit in 1991 endorsed a declaration of 17 principles of environmental justice, which are reproduced below.

First National People of Color Environmental Leadership Summit

Principles of Environmental Justice

(1991)

WE, THE PEOPLE OF COLOR, gathered together at this multinational People of Color Environmental Leadership Summit, to begin to build a national and international movement of all peoples of color to fight the destruction and taking of our lands and communities, do hereby re-establish our spiritual interdependence to the sacredness of our Mother Earth; to respect and celebrate each of our cultures, languages and beliefs about the natural world and our roles in healing ourselves; to ensure environmental justice; to promote economic alternatives which would contribute to the development of environmentally safe livelihoods; and, to secure our political, economic and cultural liberation that has been denied for over 500 years of colonization and oppression, resulting in the poisoning of our communities and land and the genocide of our peoples, do affirm and adopt these Principles of Environmental Justice:

1. **Environmental Justice** affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction.

2. **Environmental Justice** demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias.

3. **Environmental Justice** mandates the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for humans and other living things.

4. **Environmental Justice** calls for universal protection from nuclear testing, extraction, production and disposal of toxic/hazardous wastes and poisons and nuclear testing that threaten the fundamental right to clean air, land, water, and food.

5. **Environmental Justice** affirms the fundamental right to political, economic, cultural and environmental self-determination of all peoples.

6. **Environmental Justice** demands the cessation of the production of all toxins, hazardous wastes, and radioactive materials, and that all past and current producers be held strictly accountable to the people for detoxification and the containment at the point of production.

7. **Environmental Justice** demands the right to participate as equal partners at every level of decision-making, including needs assessment, planning, implementation, enforcement and evaluation.