Toward Sustainable Communities

Transition and Transformations in
Environmental Policy

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The Three Epochs of the Environmental Movement

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Since the onset of the modern environmental movement, a great deal has been learned about our ability to direct economic activity, affect human values and behavior, and create a more livable and sustainable world through public policy and government action. The United States has been one of the important crucibles of this learning, with a growing awareness of the interrelationships among social, economic, and environmental systems and the difficulty of changing one without affecting the others in ways both anticipated and not.

A great deal has been accomplished over the past decades through the regulatory enforcement of the range of national environmental laws and policies adopted in the 1970s and 1980s in appreciably reducing air, water, soil, and other environmental pollutants and health risks, on a per capita basis and in total across the nation. Yet it is also true that these gains *are likely to be* short-lived as greater amounts of fossil fuel energy and materials are consumed by an ever growing population and as additional threats to the environment become more prominent—such as the buildup of greenhouse gases, deterioration of the stratospheric ozone layer, rapid decline of species of plants and animals, and depletion of nonrenewable natural resources. Moreover, curbing harmful development and human expansion in one location—a pristine coastline, wetlands, a unique landscape, or an endangered species habitat—does not prevent it from surfacing somewhere else. And that somewhere need not be in North America, but anywhere on the globe, as the world's population grows from 6.7 billion today to 9 billion or more by 2050.

Important politically, the extensive effort by the United States to clean the nation's environment since the 1970s has come at times at the price of economic growth for business and industry, and it has contributed to the migration of some industries from one region to another within the

nation and to other countries. Establishing and implementing the nation's environmental laws and regulations also has led to the creation of substantial federal bureaucracies, which can frustrate as much as help remedy environmental problems (Durant, Fiorino, and O'Leary 2004; Eisner 2007; Rosenbaum 2008; Vig and Kraft 2006).

Today, therefore, the decades-long national regulatory policy framework for environmental protection in the United States is undergoing significant reassessment on three fronts. One is its overreliance on command-and-control regulation, which despite notable achievements in the past can no longer be the only or perhaps even the major strategy for achieving environmental sustainability as we look further into the twenty-first century. Among the most important limitations of traditional regulatory policy is its high cost to business and governmental enforcement agencies, its emphasis on remedial rather than preventive actions, and its complex, cumbersome, and adversarial rule-making processes. These weaknesses have proven to be especially significant during times of economic stagnation and diminishing budgetary resources.

Second, national environmental policy often leaves both industry and state and local governments without the flexibility and incentives to achieve environmental quality objectives. Critics argue that the federal Environmental Protection Agency (EPA) often has been unsuccessful at priority setting and program management as it has struggled to balance competing needs and operate within a contentious political environment (Fiorino 2006; Vig and Kraft 2006). Perhaps not surprisingly, management failures and political gridlock at the national level have stimulated considerable policy innovation at the state and local level, an intriguing development that most of the chapters in this volume recount in some detail (Rabe 2006, 2007; Klyza and Sousa 2008).

The third limitation of the regulatory approach is, ironically, its neglect of the broader goal of sustainable development. In the flurry of action by the federal government to develop policies for specific air, water, and other pollutants and to address some of the more visible resource problems, no strategies or policies were developed for working across policy domains, from air and water pollution to energy, agriculture, construction, transportation, land use, and urban planning, in a more comprehensive approach that would simultaneously provide pollution reduction while fostering economic development and quality of life. Even today, while the need to develop a more comprehensive and forward looking strategy is recognized, this task remains beyond the scope of the nation's

environmental protection policies, which were largely set down in the 1970s and 1980s, and largely beyond the capacity of the EPA and other federal agencies that are charged with implementing the nation's environmental programs.

As a consequence of being overlooked initially and largely ignored at the national level by Congress and most presidents since the 1970s (with the noted exception of the Clinton administration's effort to foster a dialogue on sustainable practices), the environmental and sustainability movement in the United States has shifted its attention to the subnational level. In doing so, it has recognized that national regulatory strategies that require direct government enforcement, while serving as an important legal and policy framework, need to be complemented with a myriad of public-private and collaborative strategies that bring communities together in pursuit of their common interests in a better future. Many of the most promising sustainability efforts today, albeit unnoticed by the national political establishment in Washington and the nationally oriented media, can be found in the growing application of new approaches at the state, regional, and city levels of government, among the rapidly growing green business and industry entrepreneurs, green industry investors, and nonprofit groups and individuals as they strive to transform themselves and their communities (Coglianese and Nash 2006; Esty and Winston 2006; John 1994, 2004; Morgenstern and Pizer 2006; Portney 2003).

Despite the many obstacles that will need to be addressed in scaling up these experiences to the national level, the lessons being learned at the subnational level demonstrate the potential and promise of sustainable communities as the path of the future. We consider these subnational collaborative, private, and nonprofit sector efforts, especially the adoption of new and more integrated approaches to sustainable growth and development, as beacons for the future and thus make them the primary focus of our attention.

In essence, we believe that American society is reaching a crossroads with respect to environmental protection in several senses of the term and needs to take stock of where it has been and reset its path for the future. Continuation of the environmental regulatory approach initiated in the early 1970s is no longer a sufficient or feasible strategy for realizing the longer-term and more transformative goals of environmental sustainability. Furthermore, the lesson of many years of work in the field leads back to one of the oldest adages of the environmental movement, which

is to think and plan globally but act locally. Be it global issues like climate change or local ones of drinkable water, clean air, and nonpolluting industry, acting locally requires mobilizing the capabilities of a broad cross-section of actors across not one but many local communities. Only in this way can the issues of a community's size and scale, together with its human needs and unique culture and ecological features, be adequately molded into an enduring and sustainable future and serve as a model for the nation.

As noted, there has been extensive criticism of centralized command-and-control environmental policy as being too costly, bureaucratic, narrow, and overzealously pursued (e.g., Davies and Mazurek 1998; Eisner 2007; Fiorino 2006). These indictments, though understandable, provide little help in identifying the roots of policy failure and the right direction for the future. It is rather remarkable, actually, that after forty years of the modern environmental movement we have very few systematic assessments of the dozens of policies and hundreds of programs of environmental protection being overseen by the EPA and the fifty states (Harrington, Morgenstern, and Sterner 2004; Knaap and Kim 1998; Press 2007). It has been similar with respect to the principles and policies being adopted on behalf of sustainable development. Although the philosophy of sustainable development has been embraced not only by environmentalists but by a growing segment of business and community leaders, the principles have remained mostly untested. Why this is the case will become more evident in the chapters to follow.

With this as our backdrop, the purpose of this book is to help readers understand the potential of, and thoughtfully engage in the theoretical and practical discussions of, the challenges inherent in moving from a regulatory strategy of environmental protection to one based on principles of sustainability. We believe the best way to do this is to learn from and build on local and regional experiences in sustainability efforts in moving toward a national consensus and policy strategy on sustainable development for the United States.

The chapters that follow in this first section of the book (Part I) focus on the evolution of thinking and understandings of the term sustainability, in chapter 2, and in chapter 3, on the most recent and fully developed practical alternative to command-and-control government regulation, commonly called results-based environmental governance. The change in philosophy in how we govern that is implicit in this new approach and the substantial change in political behavior it will require

represent an important step beyond the limitations of the conventional, centrally managed regulatory approach set in place in the early days of the modern environmental era.

Following these discussions, Part II provides intriguing examples of policy experiments in air, land, and water that have begun to move beyond the regulatory approach, into what will be characterized as the second environmental epoch (discussed below). Part III focuses on the more recent generation of policy approaches and community and regional pilot programs and experiments across the public, private, and nonprofit sectors in sustainability that are pointing the way to the future, raising the specter of a second fundamental transformation in the modern environmental movement.

Organizational and Conceptual Overview

Focus on Environmental Epochs

What history tells us is that the response to most environmental problems, whether successful or not, evolves through an organic process of trial, error, and societal learning. It is clear in retrospect that there has been an evolution in the way people think about and frame the issues of environmental protection, and the strategies and policy tools used to address them. To make sense of the present while anticipating the future, it is essential to understand this progression. The progression, which has been incremental when viewed close up and day-by-day, can be more readily and usefully understood when viewed over the course of multiple decades, and, as we believe, as a small number of distinct though overlapping epochs. Each epoch is characterized by a dominant way of defining "the" environmental problem (comprising both a scientific and value component), which in turn leads to a set of policy goals, the use of certain implementation strategies, and other features that must be considered together to capture the essence of the epoch.

Understanding the historical sequence or evolution of these epochs is important also in that policy actors in each learn from the ones that preceded it, ultimately overshadowing (in terms of dominant ideas and focus) and overlaying them (in terms of policies and programs) yet never fully replacing them—along with all the confusion and complexity such progression leads to. Like a good map, the epochs approach attempts to outline the key features of the landscape and show the links between past and present, while indicating how each is distinct in some fairly

Table 1.1
From Environmental Protection to Sustainable Communities

	Regulating for Environmental Protection 1970–1990	Efficiency-Based Regulatory Reform and Flexibility 1980–2000s	Toward Sustainable Communities 1990–present
Problem Identification and Policy Objectives	• pollution caused primarily by callus and unthinking business and industry • establish as national priority the curtailment of air, water, and land pollution caused by industry and other human activity	• managing pollution through market-based and collaborative mechanisms • subject environmental regulations to cost-effectiveness test • internalize pollution costs • pursue economically optimal use of resources and energy • introduce pollution prevention • add policies on toxic waste and chemicals as national priorities	• bringing into harmony human and natural systems on a sustainable basis • balance long-term societal and natural system needs through system design and management • rediscovery of/emphasis on resource conservation • halt diminution of biodiversity • embrace an eco-centric ethic
Implementation Philosophy	• develop the administrative and regulatory legal infrastructure to ensure compliance with federal and state regulations	• shift to state and local level for initiative in compliance and enforcement • create market mechanisms for protection of the environment	• develop new mechanisms and institutions that balance the needs of human and natural systems, both within the U.S. and around the globe • focus on outcomes and performance

Points of Intervention	• end of the production pipeline • end of the waste stream • at the point of local, state, and federal governmental activity	• the market-place, which serves as the arbiter of product viability • provide education and training at several points along the cradle-to-grave path of materials and resource use	• societal level needs assessment and goal prioritization • industry-level attention to product design, materials selection, and environmental strategic planning • individual behavior and life-style choices
Policy Approaches and "Tools"	• policy managed by Washington, D.C. • command-and-control regulation • substantial federal technology R&D • generous federal funding of health and pollution prevention projects	• policy managed more by states and affected communities • federal role shifts to facilitation and oversight • introduction of incentive-based approaches (taxes, fees, emissions trading) for business and industry • creation of emissions-trading markets	• comprehensive future visioning • regional planning based on sustainability guidelines, • Total Quality Environmental Management (TQEM) and life-cycle-design practice in industry • various experiments with new approaches
Information and Data Management Needs	• firm-level emissions • waste stream contents and tracking • human health effects • environmental compliance accounting in industry	• costing out environmental harms and benefits of reduced pollution • provision of readily accessible emissions data (e.g., through Toxics Release Inventory and right-to-know programs)	• sustainability criteria and indicators • eco-human support system thresholds • region/community/global interaction effects (e.g., regarding CO_2 emissions and depletion of ozone layer)

Table 1.1
(continued)

	Regulating for Environmental Protection 1970–1990	Efficiency-Based Regulatory Reform and Flexibility 1980–2000s	Toward Sustainable Communities 1990–present
		• professional protocols for environmental accounting in industry • ecosystem mapping	• utilization of ecological footprint analysis • use of material and energy "flow-through" inventories and accounting • computer modeling of human-natural systems interactions
Predominant Political/ Institutional Context	• rule of law • adversarial relations • zero-sum politics • focus on national regulatory agencies and enforcement mechanisms	• alternative dispute resolution techniques • greater stakeholder and public participation, especially, at the state and local level • reliance on the market place	• public/private partnerships • local/regional collaborations • community capacity building and consensus building • mechanisms created to enforce "collective" decisions
Key Events and Public Actions	• Santa Barbara oil spill • Earth Day • passage of the 1970 CAA and 1972 CWA • passage of National Environmental Policy Act • creation of the Environmental Protection Agency	• Carter administration focus on cost of environmental regulation • election of President Ronald Reagan • Love Canal, Bhopal • RCRA and SARA • growth in state and local environmental policy capacity	• Brundtland report, *Our Common Future* Earth Summit (UNCED) • Montreal Protocol on CFCs, • Kyoto Protocol adoption • Intergovernmental Panel on Climate Change, series of reports • Hurricane Katrina

fundamental ways. The focus on epochs also enables us to stand back from the details and narrow views that come with everyday life and grasp the overall features of the environmental movement at each major juncture in its history.

Finally, there has been dramatic growth in understanding about the environment over the past four decades, with each epoch bringing into clearer focus the interdependence of human and natural systems—and nation-states, continents, and civilizations—and the ultimate limitation of the Earth's ability to sustain infinitely expanding human populations and levels of material consumption. Understanding the "map" of the first two epochs of the modern environmental movement, combined with the growing awareness of the threats to the health of the natural environment at home and around the world, is the basis for our forecast of the epoch to come, viewed from today's vantage point on the cusp of the transformation to a more sustainable civilization. We believe that it is both necessary and likely that the United States will move to a more enduring and sustainable epoch in which concerns for the natural environment and how it relates to all other aspects of our economic and social worlds will play a far more pronounced role in policymaking. We also expect that the transition will occur at widely varying rates and in different forms from one region of the nation to another and across communities.

Table 1.1 presents the three epochs around which the book is organized, beginning largely in the early 1970s with the rise of environmentalism as a social and political movement in the United States and the buildup of the system of federal command-and-control environmental regulation, with its hallmark clean air, clean water, toxics and hazardous waste legislation, creation of the U.S. EPA, and strong federal presence. The third epoch brings into focus the potentiality of sustainable development and sustainable communities as we project further into the twenty-first century. While the movement is global in scope, as are some of the critical issues such as climate change and the overfishing of the world's oceans, our focus will be on how the movement is unfolding in the United States. The second epoch is transitional in several notable respects. It has been marked by the drive for efficiency and flexibility in the regulatory apparatus created in the first epoch. Its rhetoric and politics have been dominated by those with business and property holdings who have seen themselves adversely affected by the generation of environmental laws of the first epoch. Future historians will likely characterize this second

epoch as one of bridging. Table 1.1 provides an overview and highlights the critical dimensions of the three epochs and major differences among them in problem identification and policy objectives, implementation philosophies, points of intervention, policy "tools," data and informational needs, political and institutional contexts, and key events and public actions. We believe these features define and differentiate the epochs from one another, and in combination gives each its overall meaning.

We should reiterate that the development of the second and third epochs has not meant the end of the first epoch. Indeed, most environmental policy scholars and practitioners acknowledge that the federally driven command-and-control regulation of epoch one continues to dominate U.S. environmental protection efforts. Many argue as well that the maintenance of some degree of stringent regulation is essential for certain reforms—such as regulatory flexibility or use of market incentives—to work well (Eisner 2007; Fiorino 2006). Yet we believe that the various critiques of the 1970s-era policies, and the reforms based on those critiques, constitute a transitional epoch by themselves, which is ongoing, and that yet another epoch has begun to evolve even as these policy dialogues and experiments continue. In short, the ideas of epoch two and three have been laid on the foundation of epoch one, so far without fundamentally transforming it. Indeed, well into the early twenty-first century, the nation has yet to see the emergence of a new generation of environmental policy, despite many calls for such a transition. Yet one can nonetheless find its seeds in a rich and diverse assortment of activities, particularly at local, state, and regional levels. It is these activities and their implications that we want to explore.

To do so, we seek to present a mapping of each epoch and to explore how useful the mapping framework is in illuminating the critical dimensions of each epoch as they reveal the continuing evolution of the environmental movement. To do this, we have asked several prominent environmental policy scholars and keen observers to contribute, bringing to bear their knowledge of either an important thematic issue—for example, the meaning of sustainability, the need for new governing institutions—or a community or policy arena where a substantive environmental issues is playing out—for example, with respect to air, water, land use, urban design—to assess how well the epochs approach helps illuminate their subject and helps us understand the dynamics in their particular case.

Problem Definition and Policy Objectives
The objective of the first modern environmental epoch was to place center stage the necessity of cleaning up America's polluted waterways, air, and land. Which business and industrial activities were responsible for the pollution was another matter, and was subject to a great deal of debate. For instance, were automobiles, industrial facilities, or climatological conditions the major source of urban air pollution? Whatever the cause, the solutions proposed were almost always costly and therefore contentious. What is clear is that during the first epoch a consensus emerged among scientists, technicians, policymakers, and the public that the issues of pollution and environmental degradation were severe and should be addressed as a top national priority. Despite the criticism that would eventually be heard about the cleanup effort prompted by this consensus, there is little question that the first environmental epoch produced significant improvements in air and water quality in the United States and made important gains in reducing the careless disposal of hazardous wastes and toxic chemicals (Portney 2000; U.S. EPA 2007, 2008; Vig and Kraft 2006).

In addition to policies aimed at specific pollutants, implementation of the National Environmental Policy Act of 1969, with its broad mandate for comprehensive impact assessment and public involvement in environmental policy decisions, spurred significant changes across federal and state bureaucracies. Protection of the nation's natural resources was advanced substantially during this era through new policies and federal mandates for protection of biological diversity and for the stewardship of public lands through what would come to be known as ecosystem management. These include the Endangered Species Act (1973), the Federal Land Policy and Management Act (1976), and the National Forest Management Act (1976), among others (Kraft 2007).

In the second epoch, the focus shifted from strict regulation to balancing environmental objectives with other social and economic priorities, with greater attention to human health effects, and to carrying out more efficiently those environmental policies that were on the books. In a few instances, goals were expanded, such as adding toxic materials and hazardous waste to the environmental policy agenda, the more demanding provisions of the Clean Air Act of 1990, and the greater recognition of the international and global ramifications of pollution. Overall, however, the pace of legislation and coverage of newly identified sources of pollution slowed appreciably in comparison with the first epoch.

What changed most markedly was faith in the philosophy of regulation and strong control by the federal government. It became clear that government alone, especially the federal government, could neither direct nor police all businesses and every community across the nation; nor could it shoulder all the responsibility for stimulating innovative responses to environmental problems (Durant, Fiorino, and O'Leary 2004; Fiorino 2006). This was not simply a reaction to ever-growing government involvement. Underlying the second epoch was the recognition that appreciable progress had been achieved in reducing harmful environmental emissions and enhancing resource protection, in policy if not always in deed. After more than a decade of being front-page news, problems of the environment garnered less and less media attention. These changes occurred within the context of the growing conservative, antiregulation, and anti–federal government political tide that grew throughout the nation in the later part of the 1970s and 1980s, culminating in the Republican Party takeover of Congress in 1994. While this conservative tide was countered to an extent by the Clinton administration's proenvironmental stance, it reached its apex with the victory of President Bush and the conservative wing of the Republican Party in 2000 (Klyza and Sousa 2008; Vig and Kraft 2006).

The lessons of the first two epochs were not lost on those concerned with environmental pollution, the health of the population, and the nation's natural resource base. Although improvements were in fact being made to the nation's waterways, air sheds, and waste sites as a result of the strong, forceful, and aggressively enforced federal and state environmental laws of the first epoch, serious environmental challenges would remain and new ones continue to emerge. These include the loss of biological diversity, the need for habitat management and open space, the possible adverse effects of climate change, and the possibility of a population growth of nearly 50 percent, to some 439 million people in the United States by 2050, and what this implies for pollution and environmental protection.

The close linkage between human population growth, settlement patterns, and industrial activity and the degradation of the environment could not be ignored if permanent solutions were to be found. Problems of the environment were neither simple to address nor isolated from the pace and growth of other human activities, and they could be remedied only with determined, comprehensive, multigenerational efforts.

The realization by a growing number of individuals and opinion leaders from many walks of life that a fundamental transformation in the way Americans relate to the environment and conduct their lives is becoming the hallmark of the third environmental epoch. Pollution reduction, habitat restoration, and determining the most cost-effective methods for achieving these goals pales in comparison to the challenges of sustainability. Focusing on sustainability draws attention to the failure to incorporate into the building blocks of our economic activity in society—including the calculation of the nation's gross national product—measures of environmental health, quality of life, and the full effects of human settlement patterns on the land and the consumption of natural resources.

Significant debate and discussions on how best to incorporate these considerations into policy and action are central to the sustainability movement and to epoch three, as chapter 2 will underscore. For example, the advocates of ecological economics have long argued, in developing their measure of "genuine societal progress," that a more complete national accounting would reveal a downward trend in the genuine per capita level of wealth of Americans, a trend shift reaching back to the mid-1970s. Such assertions have been hotly contested in conventional economic circles. Moreover, the efforts to transform the way we account for the nation's wealth only begs the question of how the intuitively appealing yet vague idea of sustainability is to be defined and measured—and no simple answer has yet been found.

For some advocates, sustainability is understood as a desirable set of pragmatic principles about patterns of consumption, energy use, pollution avoidance, and lifestyle changes to guide everyday action by individuals, business and industry, and communities from the smallest village to the largest of nations. For others, it is an ethical and moral imperative, even a theological creed for humans to live by. The simplest and possibly most encompassing definition of sustainability was provided by the World Commission on Environment and Development (Brundtland Commission 1987, 43): "meeting the needs of the present without compromising the ability of future generations to meet their own needs." What exactly constitutes needs and how to meet them are questions that remain open.

An important intergenerational ethical distinction has been made between "weak" and "strong" definitions of sustainability. In the former,

the present generation has an obligation to pass on to future generations an average capital stock—of goods, services, knowledge, raw materials—that is equivalent to today's. In effect, taking all natural and human resources together, the current generation is obliged not to deplete the total stock. Although any given generation may deplete certain resources, as long as those can be replaced through human invention, the process is sustaining. The "strong sustainability" version, in contrast, says that certain natural stocks are essential ecological resources and building blocks for the much broader ecosystem (e.g., the ozone layer and biodiversity), and thus are inappropriate for averaging in with other kinds of assets (e.g., energy-efficient and low-polluting technologies). Not all assets are the same and, for the strong sustainability school, some natural resources and ecological processes are critical; they cannot be depleted below a certain level without dramatic ramifications for sustainability. Thus they cannot be easily averaged into an intergenerational balance sheet.

Ambiguity remains in the concept of sustainability and related concepts such as the "carrying capacity" of the planet. Nevertheless, there is growing recognition that human populations cannot expand indefinitely given the physical limitations of the Earth's land mass and resource base and human dependence on critical ecological processes. It is possible, however, to imagine a trade-off between the absolute size of the planet's population—or that of a town or community—and its energy and resources support systems. A population that consumes less per capita can sustain a larger size over time. For every combination of population size and average resource use there is a limit beyond which the capacity of ecosystems to sustain human beings breaks down. Determining where these thresholds lie is one of the central questions for analysis for the third epoch of environmentalism, as will be made clear in the following chapters.

Implementation Philosophy, Points of Intervention, and Policy Tools
Implementation philosophy goes to the heart of beliefs about how best to achieve agreed upon public policy goals (Mazmanian and Sabatier 1989), and these ideas heavily influence the points of intervention selected and policy tools adopted. Even when different groups and officials can agree on what they want accomplished, determining how best to do so may not be easy. Should people be coaxed or compelled to act a certain way? Should noncompliance be punished, and if so how severely? Should

emphasis be placed on educating people and providing them the where-withal to change, or should they be expected to change their behavior, irrespective of costs or their level of awareness of alternatives, as a matter of law? Furthermore, the status, power, and public perception of the groups the legislation is intended to affect often have a great deal to do with the implementation philosophy adopted by political leaders and, in turn, what policy tools are utilized and where.

Seldom explicit, implementation philosophy is usually embedded in the mechanisms that Congress, state legislatures, and communities estab-lish to carry out public policies. Their understanding of the problem and of how best to bring about the desired changes in people's actions are revealed in how they decide to assign various responsibilities. For example, they may assign a task to an existing federal, state, or local agency. Or they may create a new agency for the job, or assign it to an existing regulatory commission, or even assign it to a variety of public-private or even wholly private organizations. They may decide to crimi-nalize certain kinds of behavior—such as disposing of hazardous waste on land—and invoke major penalties for violations, or they may make them minor violations with minimal penalties.

The implementation philosophy of the first environmental epoch was long on process and building new governing institutions, along with oversight of government activities as they affected the environment, but short on actually dictating the behavior of business, industry, and indi-viduals. The signals were clearly mixed, but a combination of both "stick" and "carrot" was utilized.

Probably the most important feature of the first epoch's philosophy was that policy needed to be centralized in the hands of a new compre-hensive federal agency: the U.S. Environmental Protection Agency. Given the level of state policy capacity at the time and the failure of most states to aggressively pursue protection of even their own environments, it was widely believed that if the nation's air, water, waste, land use, and related pollution problems were to be addressed successfully, it would have to be done under strong national, uniform guidelines and enforcement by a single agency, along with forceful legislation in critical areas of concern. The most important "seven pillars" of environmental protection legisla-tion from this era are highlighted in box 1.1. For this purpose we exclude the equally important natural resource policies adopted at about the same time, such as the National Environmental Policy Act of 1969. This core of environmental protection or pollution control statutes was

Box 1.1
Seven Pillars of the First Environmental Epoch

(1) The Clean Air Act (CAA). The 1970 act required the EPA to set uniform, national ambient air quality standards to "provide an adequate margin of safety" to protect public health "from any known or anticipated adverse effects" associated with six major pollutants.

(2) The Clean Water Act (CWA). Formally the Federal Water Pollution Control Act Amendments of 1972, the CWA set a national policy for cleaning up the nation's surface water. It established national deadlines for eliminating discharge of pollutants into navigable waters and set as a goal "fishable and swimmable" waters nationwide.

(3) The Safe Drinking Water Act (SDWA). The 1974 act was designed to ensure the quality and safety of drinking water by specifying minimum public health standards for public water supplies. It authorized the EPA to set National Primary Drinking Water Standards for chemical and micro-biological contaminants in tap water. The act also required regular moni-toring of water supplies to ensure that pollutants stayed below safe levels.

(4) The Resource Conservation and Recovery Act (RCRA). In the 1976 act, Congress required EPA to regulate existing hazardous waste disposal practices as well as to promote the conservation and recovery of resources through comprehensive management of solid waste. RCRA required the EPA to develop criteria for safe disposal of solid waste and the Commerce Department to promote waste recovery technologies and waste conserva-tion. The EPA was to develop a "cradle-to-grave" system of regulation that would monitor and control the production, storage, transportation, and disposal of wastes considered hazardous, and it was to determine the appropriate technology for disposal of wastes. The act was strengthened in 1984.

(5) The Toxic Substances Control Act (TSCA). In this 1976 act, the EPA was given comprehensive authority to identify, evaluate, and regulate risks associated with the full life cycle of commercial chemicals, both those already in commerce as well as new ones in preparation. The EPA was to produce an inventory of chemicals in commercial production, and it was given authority to require testing by industry where data are insufficient and the chemical may present an unacceptable risk.

(6) The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Con-gress created FIFRA in a 1947 act that established a registration and labeling program housed in the Department of Agriculture that was ori-ented largely to the efficacy of pesticides. In 1970 Congress established the modern regulatory framework that turned jurisdiction over to the EPA. FIFRA requires that pesticides used commercially within the United States be registered by the EPA. It sets as a criterion for registration that the pesticide not pose "any unreasonable risk to man or the environment,

taking into account the economic, social, and environmental costs and benefits of the use." The act was amended significantly in 1996 with the Food Quality Protection Act.

(7) The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). Congress enacted CERCLA, better known as Superfund, in 1980 and revised it in 1986 with the Superfund Amendments and Reauthorization Act (SARA). The act is a partner to RCRA. Whereas RCRA deals with current hazardous waste generation and disposal, the Superfund is directed at the thousands of abandoned and uncontrolled hazardous waste sites. The act put responsibility for the cleanup and financial liability on those who disposed of hazardous wastes at the site, a "polluter pays" policy.

developed at a time when it was believed that a "big stick" was necessary to bring about change and that state and local governments either could not or would not be forceful enough. This top-down approach can be contrasted with the decentralized, though still governmental, approach of the second epoch, and the community-based, multisector and more integrative strategy envisioned for the third epoch.

The administrative task this approach presented to the EPA was formidable, particularly for a regulatory bureaucracy struggling to gain legitimacy and sufficient resources to do its job while fending off critics, from both outside and within the federal government. Moreover, what policy and government capacity did exist to deal with air, water, and land pollution was spread among different agencies with little history of coordinated action. In recognizing this history and the inherent difficulty of developing a more integrated approach, Congress and the EPA adopted a pollution or problem-specific organizational structure, which persists to the present, with separate program offices for air and radiation, water, pesticides and toxic substances, and solid wastes and emergency response.

To carry out its expanding mission, the agency's staff grew from about 6,000 in its first full year of operation to approximately 18,000 by the mid-1990s, with two-thirds working in the agency's ten regional offices and in other facilities located outside of Washington, D.C. The agency's operating budget rose from an initial $500 million in 1971, to about $4 billion in the 2000s. However, adjusted for inflation, the operating budget by late in the first decade of 2000 was not appreciably higher than was it was in 1980 (Vig and Kraft 2006). A lack of resources has dampened

the agency's ability to keep up with the increased responsibilities that Congress has assigned to it over the years.

Finally, it was initially believed that the demanding new controls over environmental pollution could be put in place without substantially altering the affairs of business, industry, and the consumer. This could be accomplished by placing the emission controls at the "end of the pipe," be it at the tailpipe of the automobile, the tip of a smokestack, or the sewer outflow pipe from a business, industry, or municipal government. Notable exceptions were in the areas of chemicals and toxic materials (see box 1.1, RCRA and TSCA), which require product and materials testing and safety certification, not simply end-of-the-pipe management.

In many respects, the implementation philosophy of the first epoch was effective in developing a strong federal implementing capacity in the form of the U.S. EPA, which in turn carried out the multiple environmental policies nationally. By doing so it helped to foster a similar capacity at the state and local level. In other respects, however, the EPA had become too successful organizationally in the process: big, cumbersome administratively, and ever-present. This contributed to the backlash against the agency and the rise of a counter-philosophy and approach that became the hallmark of second environmental epoch. The backlash emerged first during the 1980s, especially during the Reagan administration, then again, as noted earlier, with the Republican takeover of Congress following the 1994 elections and the election of George Bush in 2000. From the mid-1990s through the 2006 elections, the combination of a conservative Congress and the Bush presidency facilitated a range of legislative, administrative, and judicial assaults that were launched by business and industry, property rights, and antienvironmental groups. Though not successful enough to derail the EPA and undo the environmental movement, this political shift and the actions that resulted did succeed in changing ideas about how best to accomplish environmental objectives (Klyza and Sousa 2008; Kraft 2007; Rosenbaum 2008).

By the mid-1980s, the dominant thinking among members of Congress, business, and the broader public was that a more decentralized and collaborative approach to rule-making and goal setting—within an integrated environmental framework, where costs were accorded greater consideration in pursuing environmental gains—was a better way to accomplish the nation's ambitious environmental agenda. This shift in policy orientation was based on the assumption that the debate was no longer chiefly over the appropriateness of having environmental

safeguards. What was most needed was the right opportunity and incentives for business and industry to marshal their creativity and technological know-how to meet the needs of a less-polluting and more energy-efficient society. This new philosophy would balance environmental goals with private-sector costs, be more flexible in application, and be driven by "incentives" rather than governmental prescription and policing (Durant, Fiorino, and O'Leary 2004; Eisner 2007; Fiorino 2006).

Economists had championed this approach for decades. But not until the second epoch did the philosophy take center stage. It was tested in several pilot programs in using market mechanisms, involving stakeholders in setting rules and regulations, and working more to cajole than compel compliance with environmental mandates. This change in philosophy reached a peak in the early 1990s with the EPA's top administrators calling for a move away from pollutant-by-pollutant rules and regulations that had built up over two decades, to integrated ("multimedia"), more decentralized, and collaborative thinking and decision making.

Even as the epoch two changes in thinking was being absorbed into the culture and practices of the EPA, its state counterparts, and business and industry, an even more ambitious philosophy emerged as the environmental movement moved into the third epoch. For these environmentalists, the lesson of the first epoch was not that compromise and cooperation were needed to soften the rigidity of top-down command-and-control, but that a far bolder and comprehensive approach was needed. What was needed was a philosophy and strategy of "sustainability," based on the conviction that more enduring solutions to the problems of environmental pollution, resource degradation, and the looming presence of climate change were required.

The call was for a sustainability approach that envisions a complex web of human and natural systems interactions and linkages, without starting or end point. This goes well beyond the much more constricted and artificial focus characteristic of earlier thinking and policy formulation that treated air, water, and other pollutants separately. Also, linking sustainability concepts to concepts of community has particular advantages, since communities represent the social and physical expression of interdependence.

The implications for policy and action, and for social relations within a community, were profound. It is not yet clear how best to think about the environmental "problem" as one of sustainability, but a number of

efforts are underway to scope the necessary boundaries and strategies for action. Furthermore, the absence of precision and clarity has not deterred leaders in the environmental movement, a growing number of those in the business communities, and many subnational public officials, from embracing the movement. As such, while the implementation "philosophy" continues to unfold, it has identified multiple points of action and transformation, as well as micro- and macropolicy tools and guideposts. Which ones will prove the most appropriate will become clear only as the third epoch unfolds.

Information and Data Management Needs

When environmentalism emerged onto the national scene in the early 1970s, there was little questioning the nature of the problem. One did not need to be an expert to appreciate that many of the nation's waterways were polluted to the point of killing off fish and were no longer suitable for drinking and swimming. In extreme cases, their oily surface could even catch fire. Industrial, urban, and agricultural runoff was polluting many underground aquifers, rendering them useless as sources of potable water. Urban smog was an eyesore—literally—in most major urban areas, especially in the hot and dry southwest, where Los Angeles epitomized the problem. Highly radioactive waste was accumulating at the nation's nuclear power plants with nowhere to dispose of it permanently—adding to the public's fear of possible nuclear accidents.

As a response, the passage of new pollution laws was just a first step. The EPA needed to develop, often from scratch, detailed rules and regulations for industry to follow to bring pollution within acceptable levels of public health and safety. Yet the extent of information about pollution and the data-gathering and measurement capabilities of the nation were quite rudimentary. While the intent of Congress to clean up the environment was clear, the practical and technical demands of gauging levels of pollution, their acute and chronic health effects, and tolerable levels of exposure were not.

Congress mandated that the regulations were to be health based, at a time when the science of epidemiology was inconclusive, dose-response rates unknown, and the understanding of the human health effects of differing amounts and duration of exposure to pollutants was modest at best. In short, a great deal of scientific and technical information was needed, and needed fast. It would not be until the mid-1970s, for example, that the EPA, working with lead states such as California, was able to

establish reliable monitoring methods for gauging air emissions for a community. It was also unknown which industries were generating what kinds of air and water pollution, and to what extent each could be reduced through new technology and better management, and at what cost.

Who should be responsible for gathering the needed information and how that information should be linked to regional, state, and national strategies for emissions control were debated during the first epoch. In the area of water pollution, where waste was typically dumped into sewers and municipal drainage systems, an entire system of permits and emissions monitoring was developed. Even after more than thirty years, however, there remains only limited monitoring data on the health of the nation's rivers, streams, lakes, ponds, and reservoirs (U.S. EPA 2007).

Air quality measures evolved with greater success, although reliable monitoring and data-collection systems would not be available until late in the 1970s. Still, year-to-year variations reflect not only gains in pollution control but changing economic activity and weather patterns. Also, it is instructive and humbling to realize that even after the federal government spent over $500 million on its massive National Acid Precipitation Assessment Program in the 1980s, uncertainty continues over the effects of acid precipitation on soil chemistry and water quality.

These and similar limitations in monitoring public health and environmental quality persist and constitute one of the major barriers to measuring environmental change and evaluating the impact of public policy efforts (Press 2007). Part of the problem is that the federal government has been unable to consolidate and integrate the diverse array of environmental data programs it does have. Improving the nation's ability to assess interrelationships among different environmental stressors and the impact on health and the environment and to relate this to public policy actions remains a challenge (Gunderson and Holling 2002).

One of the defining characteristics of the second epoch has been the frequency and severity of criticism directed at environmental policy, although fewer questions have been raised about the progress made to date in cleaning up the environment. Rather, critics tend to emphasize the intrusiveness of environmental policies, the substantial costs they have imposed on the private sector and on state and local governments, the inefficiency of command-and-control regulations, and

the rapid rise of federal, state, and local bureaucracies associated with the nation's environmental programs (Durant, Fiorino, and O'Leary 2004; Fiorino 2006; Eisner 2007). These critiques resulted in the demand that the administrative and compliance costs of regulations be balanced against pollution reduction and health gains from any given rule or regulation.

The concern of the third epoch goes well beyond prescribing regulations for cleaning up pollution or conventional cost-benefit analysis of their effects. What is being asked for is a method of gauging the multiple ramifications of an action—rule, regulation, activity—within a large and complex array of possible effects, in the near term and well into the future. The level of scientific and technical data, understanding of ecological processes, and analytical capability needed for this kind of assessment is greater than ever before. Only through computer-assisted analysis and simulation will it be possible to conduct the needed analysis in most instances. With only limited data of the sort needed now available, and those with the requisite analytical skills still few in number, a great deal of new kinds of data and analytical capacity is called for, from energy and materials throughput analysis and metropolitan area footprint analysis to green accounting in business and industry.

Predominant Political/Institutional Context
The environmental policy revolution of the 1970s was guided by a set of assumptions about the capacity of state and local governments to identify and act on environmental problems, the willingness of business and industry to minimize costly remedial actions, and the capabilities of a centralized federal government to bring about substantial change in a short period of time. It was assumed, for instance, that business and industry would not voluntarily cooperate in cleanup and, indeed, that they would resist in all manner possible. Policy was designed in this adversarial context. Not surprisingly, both sides lobbied heavily as legislative proposals were formulated and debated in Congress and other venues. They also sought to shape the decisions made by administrative agencies, and they resorted often to the courts to resolve their differences and clarify rights and responsibilities (Kamieniecki 2006; Kraft and Kamieniecki 2007).

The second epoch reflected a desire to find a middle ground through developing new forms of collaboration and participatory policymaking and rule making. With this shift came the emergence of alternative

dispute resolution, extensive collaboration, negotiated rule making within the EPA, and similar processes as ways to move beyond gridlock politics and costly legal proceedings. The assumption was that bringing the key stakeholders in a policy arena together would foster greater understanding and cooperation, and allow all parties to focus on areas of shared interest and policy agreement. If nothing else, these changes launched an extraordinary era of searching for common ground and consensual solutions to deeply divisive environmental problems (Kraft 1994; Mazmanian and Morell 1992; Sabatier et al. 2005; Williams and Matheny 1995).

As important as these new decision-making processes are as educational devices and ways of resolving disputes, they have not fully eliminated the suspicions and conflicts among contending parties, nor are they always well suited to resolving fundamental conflicts. Indeed, the confrontational politics used during the Republican-controlled Congress of the late 1990s and early 2000s to weaken environmental policy, and the strong countermovement by a rejuvenated environmental community, attest to the deeper cultural persistence of politics as usual (Klyza and Sousa 2008; Kraft 2007). It would appear that the willingness by the parties to environmental conflicts to use alternative mechanisms for resolving disputes in the second epoch reflects only a partial and strategic commitment on their parts, rather than a fundamental rejection of the older adversarial form of political decision making.

For the third epoch, now in its formative stage, collaboration and cooperation among all affected stakeholders and incentive-based methods of policy implementation are promoted as the preferred approaches for both philosophical and instrumental reasons (Maser 1997; Weber 2003; Wondolleck and Yaffee 2000). What began as experimentation in epoch two is being embraced more deeply in order to reach and assure genuine community-based sustainability. In this vein President Clinton's Council on Sustainable Development of the mid-1990s focused on this approach. With remarkable unanimity, the council's members called for a new generation of flexible, consensual environmental policies that would maximize economic welfare while achieving more effective and efficient environmental protection. The United States, council members said, "must change by moving from conflict to collaboration and adopting stewardship and individual responsibility as tenets by which to live" (PCSD 1996, 1). Such a statement reflected more idealism than realism, but it indicated the kind of political values that were beginning to infuse

third-epoch thinking and the effort to seek new forms of governance, starting at the local community level (Hempel 1998).

Analysts examining these trends hail the potential of public education campaigns, collaborative decision making, public-private partnerships, and continued and increasing reliance on market incentives (Durant, Fiorino, and O'Leary 2004; Press and Mazmanian 2006). The transition has only begun, however, and for the present we have an unusual hybrid form of environmental regulation in which new approaches are placed alongside or overlying the old. The potential for significant improvement has been demonstrated when the right conditions present themselves, but the persistence of the formal apparatus of command-and-control regulation in the major environmental protection statutes and their attendant regulations remains and continues to be appropriate in many instances.

What Follows

The chapters that follow provide a combination of illuminating case studies of changes in the thinking and action of the environmental movement, further clarification of the conceptual issues underlying the changes, and concrete evidence of the two major transformations under way: from the first to second as well as second to third epochs. The dates dividing the epochs are never as clear and crisp in practice as described analytically in table 1.1, and the timing and overlapping nature of the transformations fit some cases, such as air and water, better than others, such as sustainable land use planning by cities. Nonetheless, the broad outlines will be revealed and the influence of the growth and learning across the wide array of environmental arenas—trial and error in one epoch, new ideas emerging and becoming dominant in the next, with revised goals and proposed new strategies—is striking. Understanding the environmental movement as it evolves through the three epochs is valuable in understanding the key dimension of societal-level change in general and the transformation of environmental policy in particular. This knowledge should find practical application among those seeking to foster and accelerate the drive toward sustainability.

Meanwhile, as scholars and researchers, we are only beginning our task. To the extent that the epochs framework proves useful in guiding analysis and helping to provide understanding of the changes past and present through our case studies, the framework will beg even more

questions of verification and other possible applications. The concluding chapter will address these issues.

The case studies in chapters 4 through 11 provide a cross section of major environmental policy areas in light of the epochs framework. We begin with cases that illuminate the transition from the first to second epoch followed by cases of transitions underway into the third epoch. The cases were chosen because they highlight and illuminate the dimensions of the transition framework combined with their substantive importance as an environmental concern. As one moves from the second to third parts of the book the greater is the shift in emphasis from transitions in environmental protection to sustainability of entire communities and regions, within which environmental concerns become embedded in a far more comprehensive framework.

Before launching into the cases, the complexity and ambiguity surrounding the notion of sustainable communities and environmental governance for the third epoch necessitate further discussion and amplification in order to round out the introductory section of the book. Therefore chapter 2, by Lamont Hempel, provides an historical overview of the origins and implications of the emergent focus on sustainability and why it is having the effect today of repositioning and galvanizing the environmental movement. The chapter serves to underscore the significant departure from the first and second environmental epochs that sustainability represents, but also the difficult transformational challenge it poses not only for the environmental movement but all of society. Chapter 3, by Dan Fiorino, draws our attention to policy and governing approaches that are being introduced to move beyond the dominant regulatory approach characteristic of the first and second epochs—new governing approaches that are better suited to the multisector, collaborative, system-integrating, and multilevel (local through global) approaches to sustainability of the third epoch.

Part II of the book provides a series of case studies of important community- and regionally based efforts at addressing conventional environmental pollution and related land-use problems. Chapter 4, by Daniel Mazmanian, examines clean air regulation, using the case of the transformation from epoch one to two in approach and practice in Southern California, the most heavily polluted urban region in the nation, where some preliminary indications of sustainability thinking infuse the policy process. In chapter 5, Michael Kraft describes extended and committed efforts to use collaborative decision making at the local and regional level

in Northeastern Wisconsin to address both point and nonpoint source pollution management under the Clean Water Act. Chapter 6 shifts the focus to land-use policy, which historically has been thought about in terms of parks, recreation, preservation, and aesthetics, but only indirectly thought of as an important component of any lasting sustainability efforts. Here Daniel Press helps us understand the historical context of land-use policy, with emphasis on the important role of local values, interests, and administrative mechanisms and how these have evolved through the epochs, albeit on a very different timescale than suggested in table 1.1.

Part III draws on new and more encompassing efforts, where multimedia, multisector, and multistakeholder strategies are beginning to emerge within communities and regions based on a comprehensive view and the goals of sustainability. The five chapters within this section examine very different contexts within which these programs are being adopted and new practices developed. In chapter 7 Elisa Barbour and Michael Teitz draw our attention to the experiments with regional growth "blueprint" planning in California, exploring and assessing conditions that foster community consensus on growth and development in rapidly expanding communities. In chapter 8, Michele Betsill and Barry Rabe examine a fascinating story in policy leadership at the subnational level regarding one of the most important challenges that will be facing the nation throughout the twenty-first century: climate change. In the vacuum created by eight years of the Bush administration's slow and exceedingly cautious response to the climate change challenge, the subnational response might be viewed as surprising since the issue is being played out mainly on the international stage, among nations, though the case serves as a refreshing reminder of the importance of the bottom up-and entrepreneurial spirit of policy innovation possible in our federal and decentralized system of government in the United States. They examine the nearly half of all the states that stepped into the breach.

In chapter 9, Kent Portney also takes us to the subnational level of government, examining the fascinating range of policy initiatives by the nation's cities to the challenge of sustainability. He probes why some cities are more likely than others to give sustainability policies high priority and why some do better than others in achieving their policy goals. This is followed by the chapter by Mark Lubell, William Leach, and Paul Sabatier that looks at watershed level sustainability planning. Watersheds typically cross long established political boundaries, cut across both

public and private lands, and because of this present a host of governance challenges. The authors draw from a number of years of studying watershed partnerships designed to overcome these obstacles, and assess how stakeholders are able to build trust, consensus, and cooperation in the pursuit of sustainability in watershed management. In the concluding illustrative case in this section, chapter 11, Barry Rabe and Marc Gaden explore one of the most ambitious, large-scale, and epoch-spanning regional efforts at environmental restoration: the case of the cleanup and restoration efforts of the Great Lakes Basin bordering the United States and Canada.

Chapter 12, by Kraft and Mazmanian, returns to the central issues of the theory–practice nexus in assessing the extent to which the epochs framework helps us understand the profound changes in the environmental movement past, present, and as we look into the future. Special attention is given to efforts to clarify the concept of sustainability at the community level in its environmental, social, and political dimensions. The chapter addresses the political and participatory dimensions, indeed requisites, of the transformation to sustainability implicit throughout all the illustrative cases.

All of the chapters incorporate an interdisciplinary orientation appropriate to the subject matter. They focus on important illustrations that provide evidence of what works and what does not at the local and regional level, and why. These are not final words on the subjects addressed, nor should they be. We hope our selection of cases conveys a sense of the range of actions begin taken across the nation, and where they do not, we hope others will develop comparable analyses of different cases that can supplement what we are able to offer here. We do think, however, that the cases move the discussion forward and help identify the conditions for successful environmental policy development and implementation. Thus they help to define the basis for policy prescriptions for localities and regions seeking to initiate strategies for building truly enduring sustainable communities.

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