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Global environmental politics

Charting the domain

Paul G. Harris

The natural environment is in very serious decline globally. With too few exceptions, environmental indicators are growing worse. For example, water and air pollution are now so poor in many developing nation-states that hundreds of millions of people are forced to drink severely tainted water and breathe toxic air (see Chapters 30 and 38). Regionally, acid rain – which has been reduced in North America and Western Europe in recent decades – is on the increase in East Asia and other developing regions, putting ecosystems and agriculture at great risk (see Chapter 30). The so-called "Asian brown cloud" of smog is so vast that it spreads across the Pacific to the Americas. Coastal seas have been overfished in most oceans, and this phenomenon has extended to regional seas in both the developed and developing worlds (see Chapter 40). Marine environments are severely degraded by polluting runoff from continents, with the world's coral reefs shrinking and ocean "dead zones" now extending along the coastlines of all continents. Wildlife around the world is under great threat, with declines and extinctions of species on the rise (see Chapter 41). Deforestation is rampant in many parts of the world, not least in parts of South America and Southeast Asia (see Chapter 42). These problems are exacerbated by climate change, which is manifested in rising global temperatures, very serious threats to agricultural productivity from droughts and floods, more severe weather events, new threats to species unable to adapt to rising temperatures and other environmental changes, declines in marine ecosystems due to warming waters and ocean acidification, and immeasurable dangers posed by sea-level rise, particularly for poor low-lying regions, states and habitats (see Chapter 32). Alas, these are only some of the environmental challenges that are increasingly prevalent around the world.

The role of politics in these challenges, whether they play out within or among states, cannot be understated. The continuing decline of the global environment can largely be put down to the failure of governments and other actors to respond effectively, if at all. When we do see successes in preventing or responding to adverse environmental changes and pollution, for example in cleaner local environments in many developed states and a handful of international successes, such as agreements among states to curb emissions of pollutants that destroy Earth's protective stratospheric ozone layer (see Chapter 31), they can often be put down to the willingness of governments and other political actors, including nongovernmental organizations (see Chapter 14) and occasionally businesses (see Chapter 13), to negotiate and

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implement policies that prioritize environmental protection over short-term economic gain. Understanding and promoting these kinds of successes are crucially important, and in many cases vital, to the future of all societies and to natural ecosystems. This handbook is intended to be part of the process of promoting those successes: first to bolster basic understanding of environmental changes and the underlying politics that shape them, and second to provide readers with a foundation of knowledge that can help them to promote new, more environmentally sustainable relationships between humankind and the natural world.

Everyone is affected by global environmental politics, often directly through feeling the impacts of the environmental changes caused by government policies, and at least indirectly through having to watch others suffer from those changes. Many people are now affected, in positive ways, by regulations and policies that have reduced environmental pollution. The manner in which human, financial and governmental resources are used to create and hopefully reverse ecological decline, overuse of natural resources and destruction of the natural environment affects the safety of the water that people drink, the air that they breathe and the nature that they enjoy and draw from to meet their individual and community needs. Global environmental politics does and will shape the climate and even the weather of the future. Sadly, for some people, global environmental politics may be a matter of life and death. For example, the failure of governments and other global actors, such as businesses and individuals, to respond robustly to the causes and consequences of climate change means that millions of vulnerable people in the poorest parts of the world will die in the future from drought-induced famine or severe weather events, and many more will die from the diseases that will spread in a warmer and wetter world.

What this means is that global environmental politics should concern everyone. Whether one is a politician, career government official, entrepreneur, activist or student, understanding global environmental politics will help achieve policy or personal goals. Without knowledge of the global nature of environmental changes, policymakers will fail to see many of the causes of those changes, and indeed the remedies for them. Without recognition that the environment permeates other policy areas, ranging from energy supplies and national security to social justice and food production, policy responses are unlikely to succeed, least of all to be cost-effective and equitable. Without realizing that both the causes and consequences of global environmental change are highly political, being influenced by the distribution of power within and among societies, those who seek to limit pollution and destruction of natural resources will not get very far. With this in mind, this handbook brings together a large group of scholars from around the world to examine these connections and to help illuminate the causes of environmental changes and especially the ways that the world has and can respond to them. It is intended to be a comprehensive treatment of the topic. While the field of global environmental politics is much too large to be fully covered in a single volume, we have sought to survey as much of it as possible, thereby giving anyone interested in (or concerned about) it a solid foundation on which to continue with more in-depth analysis or study.

Before the contributors to this volume proceed to examine global environmental politics more widely, the remainder of this chapter briefly charts this important domain. It defines the topic and its related field of study by briefly looking at the *global*, the *environment* and the *politics* in global environmental politics. The chapter then distinguishes between the *practice* of global environmental politics and the *study* of it, in the process suggesting how the two do and should overlap. This chapter also introduces the topics that will follow in subsequent chapters, in the process showing how the field is both wide and deep, in many respects reinforcing the importance of global environmental politics for everyone.

Defining global environmental politics

What is "global environmental politics"? Global environmental politics is both an area of activity and practice, on the one hand, and a field of research and study, on the other. It is about how governments, diplomats and other actors influence the global environment, which includes local and regional environments, and how what they do is analyzed and understood by scholars, students and activists. Global environmental politics, in a plural sense, can be interpreted as the various ways in which politics are practiced in different places to alter or protect the environment. That is, there are different politics of the environment in different locations and in different issue areas. Importantly, as the term implies, global environmental politics is about the politics of the environment on a global scale.

The "global" in global environmental politics

Environmental changes and associated politics occur at all geographic and social levels. Environmental changes can occur locally and be caused by what happens locally, as when local water supplies are polluted by domestic sewage or industrial effluents. In contrast, environmental problems can be global, as in the case of global warming and associated planetary-scale manifestations of climate change. These levels of environmental change are routinely connected, sometimes intimately. For example, global climate change arising from emissions of carbon dioxide and other greenhouse gases all around the world affects local communities and individuals directly. Global problems can have local causes. Conversely, even apparently localized environmental issues can be global problems. For example, addressing local water and air pollution in poor states may require financial or technological assistance from affluent states, often those far away, or from the international community, perhaps in the form of an agency of the United Nations or an international nongovernmental organization.

These varying levels of environmental change, and the various levels of causality, impact and response, highlight the role of politics at all levels. We see different environmental politics depending on the location, scale or issue being addressed. For example, some local environmental problems can be addressed through local action, as occurs when a community implements regulatory measures to curb pollution or to protect local natural resources. Other environmental problems are regional, crossing provincial and national boundaries or entire oceans, requiring, and sometimes receiving, policy responses from a number of communities or national governments. Examples of this kind of environmental politics include responses by North American and European governments to reduce acid rain (see Chapter 30), action plans to limit pollution of the Mediterranean Sea, and management of fisheries in regional seas (see Chapter 39). Environmental problems that are more obviously global, such as stratospheric ozone depletion (see Chapter 31) and global warming (see Chapter 32), require global political responses: the governments of many states need to cooperate and collaborate to formulate and implement policy responses, and these, in turn, require action by many more subnational governmental bodies as well as non-state actors that operate globally (or nearly so), such as multinational corporations and international nongovernmental organizations (see Chapter 14).

Thus, in using the term "*global* environmental politics" we mean to encompass all levels of politics (and policy) related to the environment; a global issue is clearly global, but a local one may also be, by definition, encompassed by global politics. Put another way, global environmental politics comprises local, national, transnational, regional, international *and* geographically global environmental issues and related political activity. As such, in this volume we are interested in environmental issues at all levels and in related political activity at all levels.

The "environment" in global environmental politics

Global environmental politics is the global politics of the environment. More specifically, the environment in global environmental politics is about the human dimensions of the natural environment (or what passes for it nowadays): the human causes of environmental change, pollution and resource use, and the human approaches to solving (or trying to solve) or preventing environmental problems and resource scarcities. The "human" here often equates to government policies and the relationships between those policies and the behaviors of individuals and industries. For our purposes, the human also includes international cooperation, often resulting in environmental treaties and other agreements (see Chapters 8, 9 and 10). This connection between environment and human society, broadly defined, highlights an important point: while global environmental politics is related to the natural environment, how we define "natural" is problematic. A purist might point out that very little of genuine nature still exists; with climate change (see Chapter 32) and the spread of persistent organic pollutants (see Chapter 35), for example, nearly every part of what was once the natural world has been affected, and often utterly transformed (or destroyed), by humanity. Nevertheless, one expects that for most people "nature" can be defined as the nonhuman world, encompassing the plants, animals, minerals, air, water and ecosystems on which humanity depends for its survival and wellbeing.

Simply put, the *environment* in global environmental politics is roughly equated to "ecology" – natural systems, including humanity and all of its influences – but with the important caveat that we are interested in the human–environment relationship, often in the context of governance. This means that the environment of global environmental politics is not about the built environment per se, except insofar as this affects the natural environment. This would be the case with, for example, energy use by buildings (because most of the electricity used by buildings comes from the burning of fossil fuels, which, in turn, contributes to air pollution and climate change) and transport infrastructure (which can greatly affect air quality and local environmental habitats; see Chapter 34). In some sense, the environment in global environmental politics is about stewardship of the natural environment. Increasingly this means stewardship of the *global* environment – of the whole of planet Earth – implying that truly global cooperation is required to ensure an environmentally sustainable future for all people regardless of where they might live.

The "politics" in global environmental politics

"Politics" can be (and is) defined in a number of ways. It can refer to the struggle for and distribution of power, and thus resources, within and among national communities. This is routinely associated with the role of governments, notably their policies and actions for regulating behaviors in society, and the manner by which governments are chosen, the institutions from which they obtain their legitimacy and the way that they rule. Global environmental politics is largely about how government policies contribute to environmental problems and about specifically environmental policies (often environmental regulations) and their effects. It is about how environmental resources and pollution are distributed in society, and the role that power and influence play in that distribution. More commonly, the *politics* in global environmental politics is about international cooperation related to the environment. This might include addressing transboundary, regional and global problems through international conferences of diplomats negotiating environmental treaties (see Chapter 22), efforts by governments to manage shared resources in natural "commons" areas (such as fish

in the open ocean beyond territorial waters; see Chapter 40), or attempts to formulate and implement international policies on sustainable development that benefit individual states (see Chapter 16), reduce local and global pollution, and support environmentally less harmful economic development (see Chapter 24).

Although global environmental politics routinely involves governments in some way, it is not always about governments relating to one another. It is often about non-state actors trying to influence government policies in ways that affect the environment (see Chapters 13 and 14). It may also involve struggles related to the environment by nongovernmental organizations, businesses and communities that largely ignore governments, at least directly. At the risk of upsetting purists, one must even acknowledge that the field of global environmental politics goes beyond politics strictly defined. Scholars of global environmental politics thus include those with interest and expertise in economics, sociology, other social sciences and even the humanities. Ultimately, the *politics* of global environmental politics is most often the process whereby the constellation of disparate interests – government agencies, corporations, communities and people, and some would add nonhuman species – is represented (or not) in actions that harm the natural environment or in efforts to protect it.

The practice and study of global environmental politics

The field of global environmental politics encompasses both practice (or praxis) and study (and analysis) of politics and policies related to the environment. The former interpretation tends to fit definitions of politics oriented toward activities of governments and traditional political players, although increasingly non-traditional actors, such as civil society groups, often organized via the Internet, have growing importance in environmental politics at all levels. The latter interpretation of global environmental politics is oriented toward research and teaching related to the politics of the environment, although it is important to note the overlap with practice: research about global environmental politics is routinely about, and very importantly can inform, the practice of global environmental politics, and students of global environmental politics might apply what they learn to environmental activism, work in industry or service in government.

The practice of global environmental politics

Global environmental politics is above all about activities – policies, actions, behaviors – that affect the environment, whether negatively (e.g., through pollution or harm to natural resources) or positively (e.g., by reducing or preventing pollution, or using resources sustainably). In its simplest form, the practice of global environmental politics includes those activities of governments that relate to the environment in some way. This might involve the work of environmental ministries, particularly when their work affects what happens in other states, and it would include the environment-related roles and activities of political executives (presidents, prime ministers) and legislatures, notably the environmental policies, laws and regulations they deliberate, formulate and implement. It follows that the practice of global environmental politics is also about the activities of all actors trying to influence and shape government policies related to the environment, and the responses of those and other actors to environmental regulation. Thus, the practice of global environmental politics within states includes the activities of special interests, notably corporations and, in many places, environmental advocacy groups, and the processes whereby those interests attempt to shape government policies related to the environment.

The practice of global environmental politics of course includes the actors working across national borders. For example, environmental diplomacy and the complex processes of international environmental negotiations (see Chapter 22) on all manner of issues – such as fishing (see Chapter 40), whaling (see Chapter 40), ocean pollution (see Chapter 39), trade in hazardous wastes (see Chapter 36), stratospheric ozone depletion (see Chapter 31) and climate change (see Chapter 32) – are most definitely the stuff of global environmental politics. Indeed, some scholars of global environmental politics focus almost entirely on this aspect of the topic – what might be labeled *international* environmental politics – including the roles of important or powerful national actors (such as the United States and China), foreign policy processes (including the roles of influential politicians or diplomats and their relationships with colleagues nationally and internationally; see Chapter 11), and the impact of international organizations and regimes (such as the United Nations and the constellation of international agreements and new practices associated with, say, biodiversity and especially climate change; see Chapters 8 and 9). In short, at least for some scholars, global environmental politics is primarily about what governments do at home and abroad to respond to environmental changes or to prevent them from happening (see Chapter 12).

The study of global environmental politics

As a field of analysis and learning, global environmental politics is about trying to understand and explain the practices of governments and other actors related to the environment, especially insofar as this is associated with international affairs or transboundary environmental issues. For most scholars this involves analyzing the practice of global environmental politics, finding explanations for what happens, and conveying this knowledge to others, often to the practitioners being studied. For many scholars this includes sharing their knowledge via publications of different kinds, sometimes in the form of policy papers intended to shape (and specifically to "improve") the policies of governments, international organizations and other actors, such as corporations, and to help them arrive at policies more conducive to environmental protection (see Chapter 18). Most scholars maintain a certain level of disinterestedness in their research: they attempt to find the "truth" behind environmental policies, for example, and to convey what they have learned to the scholarly and policy communities. Other scholars and researchers have more normative objectives: they want to see the environment and natural resources protected, so their research is aimed at finding ways to make that happen, possibly including advocacy work toward that end (see Chapter 27). A few (often self-styled) scholars, such as the so-called "climate skeptics" and "climate deniers," have just the opposite objective: to use their work to *prevent* governmental regulation for environmental protection.

For many scholars of global environmental politics, their work includes teaching others what they have learned about the practices of global environmental politics, notably in college and university courses (sometimes titled "global environmental politics," "international environmental politics" or something similar). These courses are often geared toward helping students who will join industries to better understand the role of environment in their future work, or to provide training for students who will join government ministries working on environmental and international affairs. Some teachers of global environmental politics no doubt hope that their students will become environmental activists. Regardless of their individual motivations, most of the contributors to this volume both conduct research on global environmental politics and teach about it.

Surveying global environmental politics

This volume brings together a diverse group of scholars from around the world. In addition to introductory and concluding sections, their contributions are organized into four parts: (1) explaining and understanding global environmental politics; (2) actors and institutions in global environmental politics; (3) ideas and themes in global environmental politics and (4) key issues and policies in global environmental politics. Together the contributors cover most topics in both the practice and study (or research) of global environmental politics, thereby giving readers, whether students, government officials, industry sustainability officers, environmentalists or ordinary concerned citizens, a scope of knowledge that is both wide and deep. Chapters describe the topic at hand in enough detail to provide a foundation for policy work and more in-depth reading and study. Most contributors also draw on their experiences to provide some assessment of real-world events. As such, on the whole, this handbook serves as a valuable primer for anyone interested in, or concerned about, humanity's relationship with the global environment.

Explaining and understanding global environmental politics

In Part II, contributors describe the theories and methods used to explain global environmental politics. In Chapter 2, Loren R. Cass provides a historical overview of global environmental politics as an academic discipline. In a wide-ranging survey of the literature, he shows how the field has advanced from one that was primarily about international environmental cooperation to one that is more inter- and multidisciplinary, encompassing a wide range of political and policy activity related to the environment while still being oriented toward international relations. In Chapters 3 and 4, John Vogler and Hayley Stevenson describe and assess all of the major theoretical approaches, and more than a few of the less common theoretical frameworks, used to analyze and understand global environmental politics. Vogler focuses on mainstream theories, notably realism and rationalism (which some might say are not always realistic or rational), that have been most commonly used by scholars, and sometimes even by practitioners, to explain the international politics of the environment. In contrast, Stevenson looks at alternative theories, including constructivism, Marxism and critical theories, which challenge the mainstream approaches. The alternative perspectives are often about showing that global environmental politics is just as much about ideas as it is about states per se.

The final chapters of Part II turn to questions of how global environmental politics is studied and taught. In Chapter 5, Juliann Emmons Allison and Thomas Hickmann draw on a wide literature to craft a framework for researching and teaching global environmental politics. They show how the theories described in the preceding chapters can be brought to bear in explaining global environmental politics to laypersons, and they propose innovative pedagogies that can be deployed to help students learn about it. In Chapter 6, Peter M. Haas, Ronald B. Mitchell and Leandra R. Gonçalves make a strong case for interdisciplinary scholarship that bridges the science–policy interface. They argue that such research is more likely to lead to publications and other outputs that will result in concrete improvements in environmental conditions. Together, the chapters in Part II serve as a theoretical foundation for the rest of this handbook and a guide for further research and study by readers of all kinds.

Actors and institutions in global environmental politics

Global environmental politics is shaped by a variety of major actors and institutions operating at all levels of human activity – from the local to the global. In Part III, contributors describe

the most prominent actors and some of the common practices, norms and institutions they often follow in their relations with one another in the context of environmental change. In Chapter 7, Hugh C. Dyer takes a critical look at what are very likely the most important and most powerful actors, if far from the only important ones, in global environmental politics: nation-states. For some scholars and no doubt for many practitioners, especially diplomats, states are *the* chief actors, often receiving all of the attention. As Dyer points out, the international system, and the notion of state sovereignty that serves as its foundation, has the potential both to solve environmental problems and to make them much worse. What may be most interesting and most important, and is certainly germane to other chapters here, is that environmental change, while partly a consequence of the behaviors of sovereign states, is challenging the very idea of sovereignty like nothing else. It may be for this reason that states quite often find it necessary to cooperate at both regional and global levels to find common approaches to addressing environmental issues. This cooperation, and especially its manifestation in international (or, more precisely, intergovernmental) environmental organizations, is examined by Kate O'Neill in Chapter 8. She reviews both the functions and operations of regional and global international organizations, in the process examining the extent to which they are autonomous actors, independent of their member states, or more often tools used by their members to promote their own interests in global environmental politics.

One interesting aspect of global environmental politics is that states (and other actors) frequently cooperate informally. This informal cooperation can take on a life of its own. In Chapter 9, Peter Suechting and Mary E. Pettenger explore this process through an examination of international environmental regimes and some of the underlying theories that are used to explain their formation and effectiveness. While there is some disagreement among scholars about how to define international regimes, they are sometimes described as principles, norms and procedures that governments agree to follow in addressing (in this case) international environmental problems. They may have formal international organizations associated with them, and indeed the most influential regimes usually do, but this is not always the case. What is important is that states, at least the most powerful ones, sometimes recognize and accept that only through voluntarily accepting and (mostly) adhering to common approaches can they solve environmental problems. Another way that the environment-related behavior of and among states is voluntarily regulated, or at least tempered, is through international environmental law, which is described by David B. Hunter in Chapter 10. International environmental law is largely a consequence of formal agreements among states: governments voluntarily agree, through treaties, to be bound to certain behaviors, for example to stop allowing the use of certain pollutants or environmentally harmful practices within their borders that might degrade the environment beyond their borders. Having said this, international environmental law can arise in less predictable ways, whether through common practices that evolve over time or as a result of decisions taken by national and international courts. Hunter shows how these formal and informal practices have resulted in an array of commonly accepted standards in global environmental politics.

Global environmental politics is about much more than cooperation among governments at the international level. It is also about what happens within states and what happens at the domestic–international frontier where international and domestic politics and policies interface, as they do in foreign policy processes. In Chapter 11, Mihaela Papa explores the crossovers among different levels of governance by focusing on foreign policy actors. She explores two approaches to environmental foreign policy, namely one that focuses on states and the roles of government officials (such as diplomats and officials in foreign ministries) as primary actors, and another that focuses more on multilevel governance and other actors

involved in global environmental politics. Moving one further step down from the purely international, in Chapter 12 Stacy D. VanDeveer, Paul F. Steinberg, Jeannie L. Sowers and Erika Weinthal describe the roles of domestic actors and institutions in global environmental politics. They do this by focusing on (and advocating) a comparative approach to analyzing global environmental politics, in the process highlighting the importance of national policies in understanding and explaining the field. It is, after all, quite often policies at this level that have the most impact on the environment.

In Chapters 13 and 14, Kyla Tienhaara and Christian Downie focus on the roles of non-state actors in global environmental politics, although it must be said that even these actors seldom act entirely independently of states. Tienhaara examines some of the actors that some scholars and observers may argue are more important than most states: corporations. She looks at how corporations wield power, influence and authority in global environmental politics, showing that sometimes businesses have inordinate ability to shape events while at other times their own conflicts leave them unable to have their way. Businesses most often work to limit environmental regulation, but occasionally they can lead in efforts to move closer to a sustainable balance between environmental and economic priorities, as is happening nowadays among some businesses that are embracing sustainability and carbon neutrality. Continuing this survey of non-state entities, in the final chapter of Part III Downie describes a variety of transnational actors in global environmental politics, including for-profit actors (like those examined by Tienhaara) and not-for-profit nongovernmental organizations, as well as other broadly civil society actors, including individuals. He shows when and how these types of actors increasingly have an impact in global environmental politics, and he helps explain why they fail to have the impact that many people might wish for. Ultimately, it is usually some amalgamation of state and non-state actors and their influences that determines environmental outcomes, whether bad or good.

Ideas and themes in global environmental politics

Like many other aspects of world affairs, people's relations with the natural environment are influenced by ideas. Even when not directly influenced by them, global environmental politics can be better understood in terms of relatively discrete ideas. For example, official and unofficial responses to environmental change have in recent decades been influenced by the notion of sustainability, or what we might define simply as the idea that there are ecological limits to economic and other human activities. Indeed, the idea of sustainability now permeates global environmental politics, although the degree to which it is implemented is debatable and certainly uneven. Similarly, a number of key themes help to characterize contemporary global environmental politics. Examples of such themes include security, which is central to other aspects of international affairs, and globalization, the powerful forces of global economic integration and opening of borders that is affecting almost every aspect of life, including as it relates to the environment. Part IV is devoted to describing these and other ideas and themes in global environmental politics.

Part IV begins in Chapter 15 with Peter Stoett and Simon Dalby's introduction to, and explication of, the "Anthropocene," a geologic epoch in which Earth's "natural" systems are increasingly affected by, and often dominated by, human activities. The human impact on the environment is so great that there is barely any part of the environment that is not affected, often extremely so in adverse ways. The notion of the Anthropocene, apart from being an accurate depiction of the current epoch, is important because it helps to highlight the importance of altering human activities if there is any real hope of preserving the

environment. In Chapter 16, Jon Marco Church, Andrew Tirrell, William R. Moomaw and Olivier Ragueneau point to what doing this will require: sustainability. They define environmental sustainability and consider how ideas about it are translated into real-world action. Closely related to sustainability – arguably the most important aspect of realizing it – is the question of material consumption, which is taken up by Gabriela Kütting in Chapter 17. She recounts the history of consumption before examining the institutionalization of the idea of "sustainable consumption." Following a theme in other chapters, Kütting shows that the problems of realizing truly sustainable consumption can often be a function of politics.

Understanding sustainability, as well as the underlying ecological and human forces that are at play when environmental commons suffer declines, requires scientific knowledge. As Andrew Karvonen and Ralf Brand show in Chapter 18, scientific expertise feeds into the processes of global environmental politics and policymaking, in the process often becoming a political issue itself. This is especially the case in the United States, where a surprising number of politicians and interest groups have become "anti-science" in their efforts to deny the reality of climate change and the importance of responding to it. Closely related to questions of science is that of uncertainty. As Jennifer Yarnold, Ray Maher, Karen Hussey and Stephen Dovers point out in Chapter 19, the role of risk in political calculations and in technological responses to environmental change are influenced by the level of uncertainty. Uncertainty makes predicting the future more difficult and of course is something that science can help alleviate. It can also play a role in defining how secure people and states feel in the face of environmental change.

Conceptions of security, whether human, national or international, often underly global environmental politics. That said, whether environmental issues are considered to be threats to security is open to interpretation, as Sabina W. Lautensach and Alexander K. Lautensach reveal in Chapter 20. For example, global climate change creates enormous national and human insecurity for poor low-lying communities and coastal states that suffer its profound direct effects, not least in the form of sea-level rise (made much worse during storms), and for those that lack the ability to fully cope with these effects. For them, climate change is an immediate threat. In contrast, many developed states, while also experiencing many of the effects of climate change, are much more able to cope with its impacts and generally have more resilient societies. In other words, an environmental threat that is existential to some poor states is a relatively distant or diminished concern to some wealthy ones. At least that is what many people, including those involved in policy processes, in the latter states believe. Even such a belief has great significance in global environmental politics. Fundamentally, the question is about whether the entire Earth system can be governed effectively enough to protect human and other forms of security. Indeed, as Frank Biermann argues in Chapter 21, the new concept of "earth system governance" challenges extant approaches to global environmental politics, in terms of both policy and research.

Another very important theme in global environmental politics is, not surprisingly, that of diplomacy, which is examined by Radoslav S. Dimitrov in Chapter 22. The processes of negotiation among diplomats, whether at formal international conferences or in backroom bilateral meetings, can greatly shape outcomes. It is during such meetings that concerns about security and insecurity can be tempered or occasionally exacerbated. This is especially true in forums where diplomats from wealthy developed states confront diplomats from developing states. As Shangrila Joshi affirms in Chapter 23, diplomats' conceptions of environmental security and how to ensure it, and more generally how to respond to global environmental problems, can be quite different depending on the states they represent. For developed-state diplomats, environmental problems may be relatively simple questions of technical responses,

but for diplomats from developing states they are often wrapped up with a strong sense of historical injustice as a consequence of colonialism and empire in past centuries. Closely related to these questions are those of economic globalization, addressed in Chapter 24 by Lada V. Kochtcheeva. Globalization is arguably one of the most powerful drivers of adverse environmental changes because it has enabled wealthy states to "export" their pollution by buying products from states where environmental regulations are relatively low. Related to this is the increased availability of finance, still predominantly originating in developed states, that can determine whether economic development around the world is more environmentally harmful or less so. Too often it is still the latter.

These themes – of the relative power of rich and poor states, of how states' diplomats relate to one another in environmental negotiations, and the extent to which globalization has fostered trade, often to the advantage of some over others while exacerbating environmental decline – raise very serious questions of justice, both internationally and locally. In Chapter 25, Steve Vanderheiden examines international justice in global environmental politics, in the process showing how states have both rights and obligations in the context of environmental change. Questions of environmental justice also obtain locally. As Hollie Nyseth Brehm and David N. Pellow show in Chapter 26, pollution harms some people more than others. In particular, marginalized communities and the poor are often saddled with waste and overuse of natural resources on which they may depend for their survival. But questions of what is right and wrong in the context of global environmental politics is not restricted to relations among states internationally or to interactions among individuals (and other actors) locally; they also raise questions about the roles of nonhuman species. With this in mind, in Chapter 27 Sofia Guedes Vaz and Olivia Bina describe the relationships between ethics and philosophy, on the one hand, and ecology and other species, on the other. Together, these chapters on justice and ethics show that questions of global environmental politics can often not be answered by focusing only on traditional conceptions of power and rights.

The final two chapters in Part IV look in greater detail at one set of actors that are central to global environmental politics at all levels – or should be, at least – but which sometimes get overlooked: the public. In Chapter 28, Sandra T. Marquart-Pyatt describes the role of public opinion in global environmental politics and its relationship to how and whether people participate in different forms of environmental action. She describes how public opinion related to the environment is measured and assessed, and addresses the importance of cross-national research to better understand the views of publics. Building on such themes, in Chapter 29 Derek Bell defines and analyzes environmental citizenship. He describes how environmental citizenship has been portrayed and studied in theoretical, philosophical and practical terms. Much as Marquart-Pyatt reveals the difficulties of stimulating strong public commitment to environmental causes, Bell shows that it is a challenge to foster environmental citizenship, even as some scholars question whether doing so is a good idea.

Key issues and policies in global environmental politics

Chapters in Parts II to IV lay the foundation for understanding global environmental politics and the various actors, institutions and ideas that influence it. In Part V we turn to specific issues in global environmental politics and many of the policy responses to them, in the process reinforcing and further illustrating the material in preceding parts of this handbook. In the first three chapters in Part V, contributors look at pollution that often has widespread geographic impacts. In Chapter 30, Loren R. Cass describes the causes and politics of transboundary air pollution and acid rain. While both air pollution and acid rain continue to grow

worse in many world regions, such as in East Asia, in other places, for example in Europe, there have been successes in tackling both problems. Cass shows how these experiences can help scholars and practitioners understand the causes of, and solutions to, other adverse changes to the environment.

In Chapters 31 and 32, respectively, David Downie and Paul G. Harris look at the truly global environmental issues of stratospheric ozone depletion and climate change. Downie's chapter describes the negotiation of quite effective international agreements to curb ozone-destroying chemicals. Indeed, those agreements have served as the framework for addressing climate change. Alas, climate change is a far more complicated problem. Both ozone depletion and climate change are caused by pollution from all around the world. However, climate change is a far more difficult problem than stratospheric ozone depletion, both practically and politically, because the sources of greenhouse gas pollution are in the billions – everyone contributes to climate change in some way – whereas sources of ozone-destroying chemicals are relatively few – the number of factories making these pollutants is relatively limited. This may help to explain why governments have been able to agree on quite successful measures to curb ozone-destroying pollution while failing so far, at least in global terms, to reverse growing emissions of greenhouse gases. The latter is largely explained by the world's growing appetite for energy, which is examined by Hugh C. Dyer in Chapter 33. Dyer takes a critical look at the core issue of energy, including the world's reliance on fossil fuels and particularly the political and economic strategies related to energy production and consumption. One of the largest consumers of energy is transport. In Chapter 34, Helene Dyrhauge examines transport and infrastructure and considers pathways toward more environmentally sustainable mobility.

Taking on other potential sources of global pollution, in Chapter 35, David Downie and Jessica Templeton describe how persistent organic pollutants have spread throughout ecosystems, presenting very serious threats to both environmental and human health. They explore how governments, nongovernmental organizations and other actors have responded to this problem. The result is a mixed bag, with real action occurring, but not always quickly or robustly enough to keep up with increasing amounts of pollution, notably in the developing world. Katja Biedenkopf expands on this theme in Chapter 36, which is devoted to describing the global politics of hazardous waste. National policies and international cooperation have resulted in multiple avenues for governing hazardous waste, but Biedenkopf characterizes these as fragmented. As with other environmental issues, hazardous waste, particularly its movement across national borders, has been addressed through international regulation. However, this certainly does not mean that the problem has been solved, least of all in ways that have achieved environmental justice. Too often, injustices associated with this type of pollution, like so many others, have exacerbated over time.

The final chapters in Part V look at major concerns related to ecosystems and the species that live within them, and at how governments and other actors have chosen – or not chosen – to address these issues. In Chapter 37, Josephine van Zeben and Violet Ross look at the exploding global problem of plastic. In their myriad forms, plastics can be valuable resources for modern life, but they quickly become a polluting scourge that taints landscapes, waterways and seas, with profound adverse consequences for ecosystems and living things. A question that van Zeben considers is whether more plastics can be turned from wastes back into resources. In Chapter 38, Edward Challies and Jens Newig look at some of the most vital issues in global environmental politics that happen to be greatly affected by plastic waste: water, rivers and wetlands. They show how water has been managed locally and internationally through the collaboration of key actors and stakeholders. Water in lakes and rivers is often

polluted, and sadly much of that pollution finds its way to the sea. This and other impacts on the ocean environment are examined in Chapter 39 by Peter J. Jacques. His chapter describes the myriad threats to the marine environment, ranging from agricultural runoff and dumping at sea to the potentially devastating effects of climate change. Extending this look at the marine environment, in Chapter 40 Elizabeth R. DeSombre describes the international and regional politics of fisheries and marine mammals. As with many other issues examined in this handbook, these have been the subjects of international agreements, sometimes at the global level. Problems persist, without a doubt, but it seems beyond doubt that things would be much worse without such agreements. To some extent the same can be said of international agreements on the protection of biodiversity, migratory species and natural heritage, which are the subjects of Chapter 41 by Volker Mauerhofer and Felister Nyacuru. As they show, environmental agreements can be successful, as demonstrated by some agreements to protect waterfowl that migrate across national borders, but these successes are greatly undermined by the relentless destruction of natural habitats.

Destruction of habitats is starkly revealed by what is happening to the world's forests, which are the subject of Chapter 42 by Constance L. McDermott and David Humphreys. McDermott and Humphreys describe how and why governments have failed to agree on a global forest treaty, in the process tying deforestation back to questions of climate change (and related international and domestic politics). One option for governments in their efforts to limit climate change is to preserve forests, which act as "sinks" for carbon dioxide, the most widespread greenhouse gas. As Humphreys shows, the question of sequestration of carbon in forests is among the most politicized environmental issues. As such, it is the stuff of global environmental politics, revealing how seemingly disconnected issues – in this case, national forest politics and the global politics of climate change – are intimately connected, becoming increasingly complex in both environmental and political terms. The final two chapters of Part V continue to make this link to climate change. In Chapter 43, Meri Juntti describes the causes of desertification around the world, in the process highlighting the politics of the problem and the roles played by key actors. International agreements have been reached to address desertification, but there is little doubt that the problem will become much worse in coming decades. In a closely related and vitally important discussion, in Chapter 44 Jennifer Clapp and Sarah J. Martin look at food and agriculture. For anyone who might still think that our reliance on the natural environment is not total, or that our connections to it are not political, Clapp and Martin's description of the politics of food should disabuse them of such thinking. Their chapter is a classic case study of how the global environment, and specifically humanity's role in undermining it while also being intimately dependent upon it, is highly politicized.

Finally, in Chapter 45 Paul G. Harris identifies many of the important themes that are revealed by the preceding chapters. He draws lessons about global environmental politics from the contributors' descriptions and analyses of events before considering the promises and prospects for both the study and practice of global environmental politics. In so doing, he also highlights some of the limits of global environmental politics – potential limits to scholars' abilities to explain it and, much more significantly, apparent limits to practitioners' abilities to *do* global environmental politics in ways that greatly lighten humanity's footprint on Earth.