1 EXPLAINING INTERNATIONAL ENVIRONMENTAL POLITICS

International environmental politics is the study of the human impacts on the environment that garner international attention and the efforts that states take to address them. If international relations is the study of both the conflicts that arise among states and the cooperative efforts states make to address such conflicts as well as shared problems, international environmental politics is the study of the cooperation and conflict among governments that surround environmental degradation, natural resource use, and other human-generated impacts on the Earth and the efforts to address them.

Humans have been transforming the natural environment for thousands of years (Turner et al., 1990). So long as humans lived in relatively small groups of hunter-gatherers, their impacts did not differ much in kind or magnitude from those of other species. But, as humans developed tools, they began to use natural resources and the natural environment in ways that differed in kind from other species and that allowed human populations to grow at faster rates and with fewer constraints than other species. The agricultural revolution and, then, the industrial revolution produced explosions in the range and types of human environmental impacts, allowing the human population to grow even faster while also increasing the amount of natural resources each human used, the environmental degradation each caused, and their life span. The fossilized footprints left by early humans in Tanzania have been replaced by the larger and longer-lasting carbon footprints of modern humans. Human impacts increasingly exceed the bounds of natural variation and the environment's ability to absorb and rebound from them. Although many environmental impacts are local, an increasing number of these cross borders or evoke concern among people in other countries. And much environmental damage has become global in nature, with

impacts and implications for people in most, if not always all, countries in the world. In the last several decades, growing concerns about these problems have made international environmental problems an increasingly common and important part of international relations and foreign policy.

If international environmental *problems* are those impacts that humans have on the natural environment that raise concern in other countries, international environmental *politics* consists of the self-conscious efforts by some people to reduce these impacts and the response (or lack of response) to those efforts, whether by supporters, opponents, or indifferent bystanders. If we consider international conflict to involve situations in which one or more countries consider the existing state of the world as suboptimal relative to alternative states of the world, then international environmental politics is the study of why and when such conflicts arise over environmental issues and why and when efforts to resolve them succeed or fail.

Goals of the Book

This book seeks to help the reader understand international environmental politics and explain why it unfolds as it does. It focuses on the 'why' rather than the 'what' of international environmental politics. It engages many, though not all, of the major issues studied by scholars of international environmental politics. It introduces readers to the substance of international environmental politics through an explanatory rather than a descriptive framework. The book defines what international environmental agreements are and then reviews explanations of why humans harm the natural environment, why some of these harms emerge on the international scene, why negotiations sometimes succeed and sometimes fail, and why some international environmental treaties succeed and some fail. The goal is to summarize those explanations while helping the reader to think rigorously about how to identify the most compelling and convincing of several competing explanations of particular outcomes in international environmental politics. Chapters focus on particular outcomes as dependent variables, identify the 'independent' variables claimed to cause those outcomes, and delineate the logics by which, and the conditions under which, those causes operate. The book also includes causes proposed by scholars representing a range of schools of thought with the view of providing readers with the theoretical foundations for adjudicating

between competing explanations of particular outcomes in international environmental politics of interest to them.

I provide analytic tools designed to facilitate the reader's own analysis of the major political aspects of any international environmental problem. Careful analyses of each stage of numerous international environmental problems have been, and will continue to be, undertaken in articles, books, and edited volumes by an increasingly large group of international relations scholars. Those analyses provide far more careful and rigorous analysis of the causes of particular cases than would be possible here. My goal, instead, is to offer a framework for thinking carefully about how we identify the causes of different outcomes in international environmental politics and to provide a list of 'likely suspects' that one must consider in explaining those outcomes. Thus, the book seeks to encourage readers to undertake more in-depth analyses of particular cases, or groups of cases, to expand our knowledge of why and when international society succeeds in addressing international environmental problems.

This book does not attempt to inform the reader in any depth about the many international environmental problems currently facing humanity nor the wide variety of efforts that have been and are being made to address them. Some important international environmental problems receive little or no attention in the pages that follow. Yet, as the number of international environmental problems has grown, generating a comprehensive list of those problems – let alone one that described and explained each – has become an encyclopedic task. The book also does not summarize several major debates that have engaged scholars and policy-makers, including those on trade and the environment, sustainable development, nongovernmental organizations (NGOs), world civic politics, and environmental security. All of those issues have received extensive and well-informed treatment in other venues. It also focuses on international environmental *politics*, in the process giving less depth to the many important contributions from the fields of international law and international economics (Birnie and Boyle, 1992; Sands, 1994; Cameron et al., 1996; Swanson and Johnston, 1999; Barrett, 2003).

The book engages the issues of international environmental politics by focusing primarily on *intergovernmental* politics, the politics of interactions among governments. To be sure, there are limits to 'green diplomacy' among governments (Broadhead, 2002). And NGOs, scientists and epistemic communities, and large domestic and multinational corporations play increasingly important roles in how humans respond to international environmental problems

(see, for example, Haas, 1992c; Garcia-Johnson, 2000; Betsill et al., 2006; Betsill and Corell, 2008). Such actors often contribute to intergovernmental efforts but also generate and implement innovative new ideas of their own, sometimes with and sometimes without any involvement by governments. Individuals as well as municipal and provincial governments often adopt 'unilateral' actions to address international environmental problems, actions that may not be coordinated with efforts in other countries but, nonetheless, help mitigate such problems. My focus here should not be taken to suggest that non-intergovernmental attempts to address international environmental problems are unimportant or ineffective but instead it reflects a choice to concentrate on the dynamics and processes of intergovernmental efforts.

I have structured my discussion of international environmental politics as a series of four policy stages. Those stages include the creation of international environmental impacts, their emergence as international problems, the negotiation of intergovernmental solutions, and the effectiveness of those solutions. Within the international environmental politics literature, differing theoretical, normative, and methodological perspectives generally coexist in complementary ways that enrich our understanding of global environmental politics. Analyzing international environmental politics in terms of the causes of major outcomes at each of these stages facilitates the desire here to have an inclusive list of potentially explanatory variables for such outcomes. The book's approach also highlights that structural constraints on choices, on the one hand, and the participation, choices, and influence of state and non-state actors, on the other, may differ from one policy stage to the next.

Finally, this book reflects that both explanations based on structure and those based on agency are central to international relations and international environmental politics (Wendt, 1987; Dessler, 1989). Almost all international environmental outcomes in which we are interested reflect the influence of both deep-seated structural variables that are relatively unsusceptible to immediate and direct human manipulation and of people – human 'agents' – making decisions that provide more proximate explanations of outcomes, decisions that could have been made differently. Indeed, careful study of international environmental politics can prompt an uneasy tension between pessimism and optimism. Pessimism arises in response to evidence that environmental degradation is globally, historically, and culturally ubiquitous and results from deep-seated, difficult-to-change, forces that appear to make the creation of international environmental problems common but their resolution

rare. Optimism arises from the (perhaps unwarranted) belief that humans can make better choices and evidence that sometimes such problems emerge on the international agenda, that sometimes states negotiate agreements to address them, and that sometimes those agreements effectively resolve problems. Fully understanding outcomes at different stages requires recognizing that structural factors do constrain the choices agents can make but leave room for political skill and energy in determining which of a more or less narrow range of potential outcomes actually occurs (Keohane, 1996: 24; Underdal, 2002: 37). Equally important, human choices, over time, can transform the 'normally invariant' structural forces that 'shape how publics and officials … experience and cope with the diverse challenges posed by environmental issues' (Dessler, 1989: 461; Rosenau, 1993: 262).

A History of the Field

The study of international environmental politics is inherently interdisciplinary, since understanding 'what is going on' in a particular environmental realm often requires understanding political science and economics, biology and chemistry, law and philosophy, and atmospheric and oceanographic modeling. Outcomes that seem obvious when only factors of interest to one discipline are considered become puzzles when factors of interest to other disciplines are brought in and, conversely, outcomes that are puzzling from a particular discipline's perspective make eminent sense when other disciplines' perspectives are taken into account. Thus, understanding the adoption of protocols under the Convention on Long-Range Transboundary Air Pollution in which countries accepted 'differentiated obligations' that entailed significantly different costs for different countries requires an understanding of the political forces within a context in which atmospheric modelers, ecologists, and economists have demonstrated the environmental ineffectiveness and the economic costs of simply continuing the 'common obligations' approach of prior protocols. The application of cost-sharing formulas from a treaty addressing chloride pollution of the Rhine to one addressing chemical pollution of the Rhine becomes surprising only after recognizing the scientific and economic realities that France was the primary source of the former problem but was only one of many sources of the latter (Bernauer and Moser, 1996). The inclusion of a progressively diverse range of disciplines in the Intergovernmental Panel on Climate Change since its first assessment reflects the

increasing recognition that climate change cannot be properly understood and effectively addressed without interdisciplinary collaboration and understanding.

As detailed in Chapter 2, environmental resources were already on the international scene by the end of the nineteenth century. Countries had begun protecting various fish species, whales, and seals before the Second World War and had made efforts to address habitat degradation, endangered species, and river and marine pollution by the 1950s. Yet, international environmental politics only emerged as a subfield of international relations in the 1970s, in the wake of growing environmental concern, particularly in the United States. Almost four decades ago George Kennan called for the prevention of a 'world wasteland' (Kennan, 1970). Harold and Margaret Sprout, Richard Falk, Lynton Caldwell, and others authored books in the early 1970s that analyzed the issues raised at the United Nations' 1972 Conference on the Human Environment (UNCHE), including in a special issue of *International Organization* (Falk, 1971; Sprout and Sprout, 1971; Caldwell, 1972; Kay and Skolnikoff, 1972; Utton and Henning, 1973). Through the 1970s and into the 1980s, several scholars dedicated significant attention to international environmental politics but they were joined by relatively few others (LeMarquand, 1977; Ophuls, 1977; Orr and Soroos, 1979; M'Gonigle and Zacher, 1979; Caldwell, 1980; Young, 1981; Carroll, 1983, 1988; Kay and Jacobson, 1983; Young, 1989b). Articles analyzing international environmental politics appeared infrequently in major international relations and political science journals. However, the field began to expand in the late 1990s, as additional scholars and practitioners took an interest in international environmental politics (Peterson, 1988; Benedick, 1989; Haas, 1989, 1990; Mathews, 1991).

The end of the Cold War, and the 1992 UN Conference on Environment and Development (UNCED) held in Rio de Janeiro, made international environmental issues both politically and intellectually more salient. Two journals dedicated to the issues were launched – *International Environmental Affairs* and the *Journal of Environment and Development* – and articles on international environmental politics became more common in mainstream international relations journals. Several university presses (including the MIT Press, Columbia University Press, and SUNY Press) developed series on international environmental politics that provided outlets for this growing scholarship. Sole authored and edited books dedicated to international environmental issues became more common (Choucri, 1993; Haas et al., 1993; Lipschutz and Conca, 1993; Sjostedt, 1993; Young and Osherenko, 1993b;

Young, 1994a; Keohane and Levy, 1996; Underdal, 1998b; Underdal and Hanf, 2000). A new group of scholars began publishing doctoral and subsequent research (Litfin, 1994; Mitchell, 1994a; Princen and Finger, 1994; Sprinz and Vaahtoranta, 1994; Bernauer, 1995a; Miller, 1995; Wapner, 1996; Dauvergne, 1997; O'Neill, 2000). Major debates were engaged related to environmental security and the trade-environment relationship (Deudney, 1990; Homer-Dixon, 1990; Bhagwati, 1993; Daly, 1993; Zaelke et al., 1993; Esty, 1994b; Levy, 1995). Since 2000, this trend has continued as researchers have examined an increasingly broad spectrum of issues including the environmental influence of the World Bank and other international financial institutions (Gutner, 2002), the role of the European Union (Andonova, 2004), the influence of unilateral state policies (DeSombre, 2000), and the influence of science on international environmental policy (Social Learning Group, 2001a; Social Learning Group, 2001b; Walsh, 2004; Mitchell et al., 2006b). The field has now grown to the point that articles on international environmental politics appear regularly in mainstream journals and as near-essential elements in edited volumes covering the major issues in international relations. Indeed, recent growth in the amount and diversity of the literature has made it increasingly difficult to track.

This research has generated numerous theoretical propositions and a corresponding number of careful empirical studies. Initially, deductive theories generated little follow-up in terms of operationalization and testing while inductive case studies generated useful insights that often were not framed in ways which could facilitate their application and evaluation in other environmental realms. As a result, different terminologies and taxonomies of causal factors often overlapped with, but often seemed unaware of, competing or complementary ones. Over the last decade, however, the field has begun to mature in several ways. Concentrated scholarly attention has generated considerable progress in the areas of international environmental regime effectiveness and the role of NGOs in international environmental governance (Underdal, 1992; Haas et al., 1993; Princen et al., 1995; Werksman et al., 1996; Brown Weiss and Jacobson, 1998; List and Rittberger, 1998; Simmons, 1998; Victor et al., 1998a; Wettestad, 1999; Young, 1999a; Betsill and Corell, 2001, 2008; Miles et al., 2002). Scholars increasingly engage critically with the work of other scholars (Sprinz and Helm, 1999; Hovi et al., 2003a, 2003b; Young, 2003 and pay increasing attention to methodological issues (Mitchell and Bernauer, 1998; Mitchell, 2002; Sprinz and Wolinsky-Nahmias, 2004; Underdal and Young, 2004). Databases that allow large-N studies have begun to be

developed to complement the extensive set of case studies of global environmental governance (Miles et al., 2002; Mitchell, 2003, 2008; Breitmeier et al., 2006). This book builds on the theoretical and empirical insights developed by this extensive literature, organizing and summarizing it in ways that facilitate its application by the next generation of scholars.

Causation

This book presents a causal account of international environmental politics. It provides a foundation for understanding and explaining the dynamics and outcomes involved in the creation and resolution of the wide range of past, current, and likely future international environmental problems. It also focuses on the 'whys' of international environmental politics rather than the 'whos', 'whats', 'whens', and 'wheres'. As background, this section delineates the perspectives on causation adopted in this book.

The following chapters investigate four analytic questions that correspond to the major stages of international environmental politics. First, why does the world face such a wide variety of international environmental problems? Second, why do some of these environmental problems emerge as issues on the international agenda while others do not? Third, why do countries devise intergovernmental solutions for some of these problems more quickly than for others? Fourth, why do some intergovernmental policies succeed at mitigating – and sometimes eliminating – the problems they address while others fail? These questions are preceded, in Chapter 2, by a discussion of what defines international environmental problems, what distinguishes them from other environmental and international problems, and of the various ways in which such problems can differ in politically important aspects of their 'problem structure'.

I have also sought to develop the reader's ability to think carefully about causes, about why certain outcomes *and not others* emerge during particular policy stages. To do so, it develops a theoretical framework designed to foster empirical explanation. Theory, whether arrived at inductively or deductively, provides insights that allow for generalization across a range of cases and supply the causal logic and predictions that are crucial to convincing explanations. Empirical explanation provides us with nuanced and accurate understandings of existing cases and allows us to provide nuanced and accurate policy advice about future cases. This book adopts an inclusive approach to theoretical claims in the belief that we can best

understand and explain outcomes in international environmental politics by exploring all the potential explanations, rejecting them as unsatisfactory *after* consideration rather than precluding them *from* consideration.

Causal claims: theory and its empirical application

This book seeks a balance between an excessively theoretical treatment and an excessively empirical one. The usual theoretical distinctions of rationalism and constructivism; realism, institutionalism, and liberalism; or power-based, interest-based, and knowledge-based certainly apply to international environmental politics (Hasenclever et al., 1997; Ruggie, 1998; Fearon and Wendt, 2002; Zürn and Checkel, 2005). Collectively, these schools of thought have identified various independent or explanatory variables alleged to drive outcomes in international relations in general, and, by extension, in international environmental politics. They have developed theoretically compelling logics for why, how, and under what conditions we should expect certain independent variables to cause certain effects. They delineate how a 'cause' under certain conditions makes an 'effect' more likely to occur or, phrased more carefully, they delineate how an independent variable having a specified value when other independent variables also have specified values makes it more likely that a dependent variable will have a specified value.

Yet, theoretical claims about causation pose two challenges to those interested in empirical explanation, namely the operationalization and isolation of variables. First, consider the challenges of operationalization. Scholars usually design theoretical claims to explain a broad class of phenomena. Even when scholars explicitly reject the value of generalization, other scholars may pick up explanations of particular cases and evaluate how well they apply to other cases. Because theoretical claims are generally made in abstract terms, applying them to explain a particular case requires the interpretation and judgment of operationalization, of mapping theoretical concepts to empirical realities. Theory can tell us how outcomes in Tragedies of the Commons are likely to differ from those in upstream/downstream problems, but knowing which outcomes are likely in any particular case requires that we classify the case as a Tragedy of the Commons or an upstream/downstream problem. Using theory to understand empirical cases, whether in international environmental politics or other realms of international relations, requires operationalizing abstract terms

and concepts in ways that accurately reflect both the theoretical claims and the empirical realities of the cases being analyzed.

Second, consider the challenge posed by the tendency of theory to treat variables in isolation. Understanding how a particular independent variable operates, how it influences some dependent variable, is often clarified by considering the variable's average influence over a range of conditions or under specified conditions. We often best understand one variable's influence by considering it in isolation from all other variables. Yet, the clarification that comes from a *ceteris paribus* – 'holding other variables constant' – approach can shift our focus away from the fact that most outcomes (and satisfactory explanations of most outcomes) reflect the influence of a large number of independent variables. Put differently, an independent or explanatory variable having a particular value rarely constitutes a sufficient condition that produces a particular outcome under all conditions; that variable's influence almost always depends on other explanatory variables (the 'control variables') having particular values. Most causes generate certain outcomes only in particular contexts. We may focus on the proximate causes of certain anthropogenic environmental impacts, of the emergence of an international environmental problem on the international agenda, or on the success of negotiations. However, the causal power of these 'triggers' almost always depends on a 'causal field' of deep or enabling causes which, had the values of the variables constituting that causal field been different, would have led to different outcomes (Brady and Seawright, 2004). Thus, even the most environmentally-damaging behaviors would pose little environmental risk if the global population were six million rather than six billion. Superb intellectual leadership on an environmental issue will not lead to a successful conclusion of negotiations if powerful states fail to see an agreement as in their interests. The most carefully drafted environmental treaty will produce sought-after behavioral changes only if background levels of concern remain reasonably high.

The incentives and dynamics of theory development in international relations pose a deeper obstacle to clear thinking about the causes of international environmental problems and the sources of their resolution. International relations has often been dominated by 'great debates' between competing schools of thought. Carr and Morgenthau juxtaposed their versions of realism to the idealism of Wilson and others (Carr, 1964; Morgenthau, 1993). Waltz (1979) posited his structural neo-realism as an alternative but distinct means of explaining international politics

which neoliberal institutionalists led by Keohane and Nye (1989) directly and explicitly sought to refute. The ensuing debate often involved scholars taking diametrically opposed positions that ceded little intellectual territory to the other side and often altogether discounted variables that the other side considered central (see Krasner, 1983; and in particular, Strange, 1983). More recently, the realist/institutionalist debate has been replaced by a rationalist/constructivist debate in which both sides often posit their preferred explanatory variables as central and the other side's as, at best, peripheral (Ruggie, 1998; Wendt, 1999; Fearon and Wendt, 2002). These debates have been productive in identifying, developing, and rigorously evaluating a range of variables as potential explanations of outcomes in international relations. Yet the development of international relations theory through debates can produce a climate in which explanatory variables are precluded from consideration on theoretical grounds rather than excluded as explanations on empirical grounds. The major debates can, nonetheless, help those interested in explaining international environmental outcomes if they lead to accepting the variables and arguments put forth by all sides as potentially explanatory while rejecting the claims that alternative variables are not, and cannot possibly be, explanatory. In short, theory provides a rich, and well-developed, list of variables that may help explain any particular empirical case or set of cases. However, the adjudication of which variables best explain a case should be based on confirmatory empirical evidence rather than on logically compelling theory alone.

This book remains agnostic regarding any particular independent variable's ability to explain any specific empirical case. For each outcome or 'dependent variable' focused on in succeeding chapters, I use prior theoretical and empirical work, often from competing paradigmatic perspectives, to identify a list of potential explanatory variables. By delineating the conditions under which, and the logic by which, each independent variable having a given value is alleged to lead to the dependent variable having a particular value, the chapters provide the tools for evaluating whether evidence from a particular case supports or refutes a claim of that independent variable's influence in that case. It leaves to the empirical analyst, rather than the theorist, the task of investigating which of various proposed variables best explain a particular case and which do not. The book also assumes that most explanations will involve only a subset of proposed explanatory variables, with careful analysis allowing the

development of strong empirical and logical arguments for the influence of some variables and, equally important, against the influence of others.

Deterministic *vs* probabilistic causality

It is worthwhile at this point to clarify the view of causation adopted here. I have assumed that the causal processes involved in international environmental politics are best treated as probabilistic rather than deterministic. In a deterministic causal model, to say X causes Y is to make one of two claims. Such a claim can mean that X is a sufficient cause of Y and corresponds to the claim that – under some specified set of conditions, whether broad or narrow – when X occurs, Y will occur. That is, given that specified conditions have been met and that X *did* occur, there is a 100 per cent probability that Y will occur. Alternatively, such a claim can mean that X is a necessary cause of Y and corresponds to the claim that, given that X *did not* occur, there is a 0 per cent probability that Y will occur, regardless of any other conditions (on necessary and sufficient conditions, see Goertz et al., 2008).

In a probabilistic causal model, however, the claim that X causes Y corresponds to the claim that when X occurs, it makes Y (as opposed to 'not Y') more likely to occur than had X not occurred. That is, neither X's presence nor its absence generates an unambiguous prediction of the value of Y, but instead simply makes it more likely that Y will take on a particular value. Explanatory variables make things likely – rather than cause things – to happen. Discussions of causation in international relations often invoke natural science analogies with corresponding images of deterministic causality in which the outcome being explained is influenced by a relatively small number of identifiable variables whose values can be observed. Thus, water can be counted on to freeze at 0 degrees C and boil at 100 degrees C so long as the water is at sea level and contains no impurities. But complex natural systems – and certainly international relations and international environmental politics – involve causal processes that are either ontologically or epistemologically probabilistic (Clark et al., 2006). When the occurrence of a particular outcome (for example, with the emergence of an international environmental problem or the negotiation of an intergovernmental agreement to address it) depends on a large number of factors, then claims that any one of those factors 'causes' that outcome, almost necessarily, depend on other variables having particular values. Given that the likelihood of that constellation of variables having their specified values will almost always be

less – and often significantly less – than one, the claim that a particular variable is a cause is necessarily probabilistic. Even if the constellation of other conditioning or enabling variables frequently does coalesce in ways that allow the variable of interest to have its alleged influence, we might still perceive that influence as probabilistic simply because we cannot know what all the enabling and conditioning variables are, let alone observe their values.

Although rejecting the notion that explaining particular cases is fostered by thinking in terms of necessary or sufficient conditions, thinking in those terms can shed light on the tension between pessimism and optimism in the study of international environmental politics. The pessimism that often pervades the study of international environmental politics reflects the sense that international environmental problems are common and their resolution is rare. We can explain that pattern of outcomes in broad strokes as due to the fact that international environmental problems are common because they have few necessary conditions but several sufficient conditions, and that both types of conditions are common. Such problems can be generated by numerous causes under numerous conditions. Their resolution is rare, however, because they have few sufficient conditions and many necessary conditions, and the simultaneous occurrence of both is rare.

Building convincing causal claims: correlations, counterfactuals, and process tracing

An important element of this causal analytic approach is an identification of the 'observable implications' of each explanatory variable and the mechanisms by which they work, which together clarify what we should expect to see in the real world if a particular explanatory variable were the cause of a particular outcome. Causal theories can generate two types of observable implications: predictions about correlations and predictions about causal processes. We strengthen a claim about a particular variable's causal influence by validating those predictions against correlational evidence and process-tracing the causal mechanisms.

Correlations between dependent and independent variables are crucial to causal analysis because they provide a fundamental and necessary piece of evidence underlying any causal claim. The importance of correlational evidence is not to contradict the adage that 'correlation does not imply causation' (Tufte, 2006: 159). Numerous important features of the world correlate with each other for various non-causal reasons. Correlations can arise when underlying

conceptual definitions are vague or are tautological. The failure to define key concepts unambiguously can lead to collecting evidence that, perhaps unintentionally, necessarily confirms a hypothesis rather than evaluates it. Tautological definitions result from theory that fails to provide the means of identifying the value of the independent variable with evidence distinct from that used to identify the value of the dependent variable. Thus, claims that negotiations succeed when political conditions are ripe (that is, that 'ripeness' causes negotiation success) will be true necessarily unless we delineate ways of determining whether political conditions are 'ripe' that are independent of whether negotiations have succeeded (Zartman, 1985). Correlations can also reflect changes in a dependent variable and an alleged independent variable because both are effects of another, unidentified or discounted, independent variable. Indeed, a central realist claim that international institutions, including international environmental agreements, are epiphenomenal involves just such a claim: that the correlation of state behavior with treaty rules designed to regulate those behaviors reflects that both are effects of the constellation of state power and interests, with compliance being an artifact of states designing international law to codify their existing interests and expected future behavior (Strange, 1983; Mearsheimer, 1995). Many important social variables also tend to increase over time, creating correlations that are simple coincidences. By almost any metric, we have seen increases in the number of international environmental problems over the past century at the same time as we have seen increases in the global population, the number of countries in the world, the number of democracies in the world, the amount of international trade, the percentage of people speaking English in the world, and the number of books written about international environmental problems. While all of the latter variables have increased, only some are even potentially causes of the increase in international environmental problems. Indeed, the last example highlights that correlations – at least simple ones – cannot identify the direction of causation. The number of books written about international environmental problems has increased over the past century, but that is more likely the effect of the increase in international environmental problems rather than its cause.

Evidence of correlation supports causal claims not so much by its presence but by its absence. Correlation is a necessary condition for causation (Tufte, 2006: 159). The correlation or covariation of two variables need not imply that one causes the other. The absence of such covariation, however, does imply that the two are not causally

connected, at least given the existing background conditions. As important, evidence that a dependent variable and an independent variable covary provides the foundation for a compelling argument that the latter caused the former once other potential causes have been excluded as explanations because they do not covary with the dependent variable or because no convincing logical arguments can be made of their causal power.

Counterfactuals are an important element in the causal approach adopted here. Counterfactuals are thought experiments designed to be cases that are identical to the actual state of the world with the exception of the value of the explanatory variable being evaluated. By comparing the outcome in that counterfactual case with the actual outcome, counterfactuals can help assess whether an independent variable was or was not the cause of that outcome. Counterfactuals are, necessarily, hypothetical cases because of the fundamental problem of causal inference (King et al., 1994). Consider an observation that both A and B occurred and the corresponding causal claim that A caused B. The latter claim implies that – in a context identical to the one observed – if A had been absent, B would also have been absent. The fundamental problem of causal inference arises because it is impossible to identify a situation that perfectly meets the conditional clause of 'in a context identical to the one observed'. In medicine, researchers often place identical twins in identical contexts and adopt double-blind protocols with placebos to approximate, as closely as possible, a world in which the medical treatment being evaluated is the only difference that could even potentially explain any differences in outcome. The movie *It's a Wonderful Life* nicely illustrates a perfect counterfactual – the angelic intervention that takes place allows us to observe in the movie's second half how the world of the movie's first half would have been different had everything been the same *except* that the protagonist had never lived. In short, counterfactuals are attempts to identify 'what would have happened otherwise', with 'otherwise' defined as 'had the alleged causal variable taken on some other value'.

The ability of counterfactuals to support a causal claim depends on the plausibility of the assertions that the counterfactual world could have existed and that the claimed outcome would have occurred as posited in that world (Fearon, 1991; Tetlock and Belkin, 1996). Counterfactuals are less plausible when it is difficult to imagine the independent variable in question having a different value than it had given the values of the other variables that the counterfactual seeks to hold constant. Thus, many claims about the

influence on state behavior of those regimes established by particular international environmental agreements (IEAs) rely on descriptions of 'no regime' counterfactual worlds and further claims about how states would have behaved in those worlds (Biersteker, 1993; Hovi et al., 2003a). The plausibility of those counterfactuals, and the causal claims they are designed to support, depends on how convincing the claim is that within the extant international political context the IEA and the surrounding regime might not have formed. No-regime counterfactuals are less plausible for IEAs whose formation was overdetermined and all but inevitable and more plausible for IEAs whose formation appears to have been highly contingent on various factors, where the absence of any one might have led it not to form.

Counterfactuals become particularly plausible when the independent variables in question can be shown to have had different values in similar circumstances. Comparative case studies are convincing to the extent that they approximate a counterfactual, thereby providing empirical support that the claimed counterfactual world could exist and that outcomes actually turned out as had been claimed in that world. Cases selected so that the independent variable of interest varies between them – but so that other independent variables known to influence the dependent variable do not – are compelling precisely because they provide us with empirical evidence that the independent variable not only *could have had*, but in a real case *did have*, a different value under otherwise-similar circumstances.

Quantitative research evaluates covariation and can be understood in similar terms. Regression equations generate coefficients for each of the included independent variables that are estimates of how much the dependent variable changes in response to a one-unit change in each independent variable, after having held all other independent variables constant at their average values. Thus, the coefficient for an independent variable that can be operationalized as either present or absent (that is, a dummy variable) is an estimate of the difference between the value of the dependent variable with that independent variable present and its value with it absent, holding the other variables constant. Notably, regression can only estimate the influence of such variables if the researcher has collected data from counterfactual-like cases, that is, cases in which the dummy variable was absent.

Process tracing is often as central to convincing causal claims as correlation and counterfactuals. Process tracing involves looking for the 'footprints and fingerprints' that can satisfy us that observed correlations are causal rather than spurious. It involves creating

convincing causal narratives that 'assess causality by recording each element of the causal chain' (Zürn, 1998: 640). Theories about causal relationships are never merely correlational in nature. Such theories involve claims that two variables will covary that derive from descriptions of *how* the independent variable causes variation in the dependent variable. They delineate causal mechanisms, causal chains, and compelling logics of why and under what conditions we should expect the independent variable to wield influence. Theories generate observable implications about correlation but also about the processes of causal influence. Thus, NGOs are theorized as influencing the outcomes of international negotiations by introducing novel ideas rather than through more material sources of power (Betsill and Corell, 2001). That claim, in turn, suggests looking for their influence by examining ideas proposed to negotiators by NGOs and the degree of 'congruence' between those ideas and 'the ideas embedded in an international agreement' (Betsill and Corell, 2001: 75). Agreements that contain specific text, principles, or ideas that originated with NGOs rather than other actors provide compelling evidence of their influence because it conforms so closely to the logic and processes proposed by theory (Betsill and Corell, 2001: 75).

Compelling explanations of the international environmental outcomes in which we are interested are built by combining elements of both correlation and process tracing. Correlational studies – whether involving large-N quantitative studies, comparisons of more limited numbers of carefully selected cases or of variation over time within a single case, or through carefully constructed counterfactuals – convince us that an independent variable was a cause by providing evidence *that* the dependent variable had a different value when – or would not have had that value if – that independent variable had a different value and that the dependent variable changed its value only after the independent variable changed its value. Process tracing and causal narratives can also convince us that an independent variable was a cause by providing evidence of *how* the independent variable caused the change in the dependent variable. The most compelling causal claims are those that bring all these elements together, combining strong theoretical logic, considerable empirical evidence that matches theoretical predictions and that demonstrates empirical correlation, plausible counterfactuals, and careful process tracing. Done well, such claims help both researchers and their audience understand and explain the world of international environmental politics.

Outline of the Book

This chapter has provided a brief history of the field of international environmental politics and has introduced the reader to major elements of the causal framework that informs the rest of the book. Chapter 2 defines what international environmental problems are and provides a brief overview of the history of international environmental problems, from early attempts to regulate shared fisheries to current efforts to address more and more varied environmental problems. It then delineates politically important ways in which international environmental problems vary as the basis for explaining why some problems are more difficult to address than others and why the type of solutions and their effectiveness varies significantly across problems.

Chapters 3 through 6 address the 'why' questions that are specific to the four key stages in the international environmental policy process. Chapter 3 asks why international environmental problems arise as frequently as they do. It also summarizes the various explanations of why so many human behaviors result in international environmental harm and why some behaviors do not produce such results. The chapter starts by describing the IPAT (Impacts = Population*Affluence*Technology) identity as an initial model of the sources of human environmental impacts. The chapter then reviews six perspectives on the sources of environmental harms and the appropriate strategies for addressing them, looking at the roles of values, knowledge, law, incentives, incapacity, and power. The chapter ends with a discussion of why environmental degradation is so common and ubiquitous; why environmental degradation is more common – and its resolution less common – in the international arena than the domestic one; and how these six perspectives can be used in conjunction to identify the causes of particular international environmental problems.

Chapter 4 explores why some international environmental problems receive international attention as soon as they are recognized, why others take decades to receive such attention, and why still others that scientists have known about for years continue to receive scant international attention. The chapter develops the argument that issue emergence results from the development of sufficient knowledge, concern, and urgency around an environmental impact. Recognizing an environmental impact as a problem, getting it on the international agenda for discussion, prioritizing the issue for action, and framing the issue are distinct functions of the agenda setting or 'issue emergence' stage of

international environmental politics. These functions are fostered by different actors and any variation in both the nature of the problem and in the contextual conditions can help or hinder the efforts of those actors.

Chapter 5 examines explanations of the success of states at forming intergovernmental institutions to address international environmental problems. The chapter starts by delineating the background conditions that can foster action on particular types of international environmental problems. It then looks at the processes of international negotiation by which knowledge and concern are transformed into specific provisions that enough states find mutually acceptable to gain acceptance of an international environmental agreement. The chapter also explores the factors that can influence agreement content, looking at the fundamental form that international institutions take, the degree to which they incorporate scientific advice, the flexibility that states are granted, and the types of primary rules, information systems, and response mechanisms they incorporate.

Chapter 6 engages questions of institutional effectiveness. It looks at the methodological issues involved in assessing institutional effectiveness, particularly those related to the choice of compliance, goal achievement, or behavior change as the indicator of influence. The chapter delineates two models of actor behavior – a logic of consequences and a logic of appropriateness – that provide overarching frameworks for understanding why states respond as they do (or fail to respond) to the commitments they undertake in international treaties. The chapter lays out the different pathways and sources of institutional influence within these logics and then details the features and strategies that intergovernmental institutions use to influence behavior. The chapter also examines the exogenous contextual conditions that, despite being beyond institutional control, play an important role in determining whether an institution succeeds in its efforts to induce behavioral change.

Chapter 7 concludes by identifying patterns in the influence of variables, actors, and processes that emerge by looking across policy stages and how those patterns vary depending on what outcomes we seek to explain. It revisits issues related to thinking causally about international environmental politics and then briefly describes debates in international environmental politics that are related to trade and the environment, the environment and security, the erosion of sovereignty, and the value of a World Environment Organization. The chapter concludes by identifying several important questions related to international environmental politics that remain unanswered and highlights the importance of conducting policy relevant research.