THE LAW OF THE ATMOSPHERE: EXPLAINING A NONREGIME

by

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Abstract

The idea for a Law of the Atmosphere was introduced to the world in 1988 as an institutional approach to atmospheric problems as a whole, and for a brief period there was a high level of interest in the idea. But a Law of the Atmosphere was never established. In this thesis, I seek to answer the question: *Why did a Law of the Atmosphere fail to become a regime during its 1988 to 1992 window of opportunity?* I created a method designed to answer this question based on a comprehensive table of factors influencing establishment of international environmental institutions that were derived from the literatures on regime formation, commons governance, and international environmental cooperation. Using document analysis and interviews, I determined which factors from this table inhibited the Law of the Atmosphere from becoming a regime. High influence factors were available solutions, leadership and issue characteristics. Moderate influence factors were policy area, resource-user characteristics, knowledge, and context.

Table of Contents

List of tables

List of acronyms

AES	Atmospheric Environment Service
AGGG	Advisory Group on Greenhouse Gases
CFC	Chlorofluorocarbons
GCM	General circulation model (related to climate change)
ICSU	International Council of Scientific Unions
INC	Intergovernmental Negotiating Committee
IPCC	Intergovernmental Panel on Climate Change
LRTAP	Long-Range Transboundary Air Pollution (Convention)
OECD	Organization for Economic Cooperation and Development
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Conference on the Law of the Sea
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WCC	World Climate Conference
WMO	World Meteorological Organization

Chapter 1: Introduction

Introduction

The atmosphere is a global commons whose integrity is threatened. The concentrations of many of the trace gases and aerosols that comprise the Earth's atmosphere are currently changing at an unprecedented rate, a phenomenon that threatens "far-reaching and major impacts" (WMO 1988, 292). The changes in these concentrations are due to both natural and human-induced causes. Over time, human-induced causes have increased. Human activities now release a wide range and large volume of pollutants into the atmosphere. The resulting consequences include altered atmospheric chemistry, damaged ecosystems, and endangered human health. Addressing these and other problems related to the atmosphere requires an approach that takes into account the unified character of the global atmosphere. The seemingly limitless links and interactions taking place between various components of the atmosphere speak to the interconnected and interrelated character of the Earth's atmosphere.

Despite the interconnected character of the global atmosphere, the current approach of the international community to governing the atmospheric commons remains ad hoc and piecemeal. At the international level, a kaleidoscope of agreements addresses multiple issues on multiple scales from bilateral to global with little consideration for the relationships among them. There are problem-specific, legal regimes on issues such as climate change, stratospheric ozone depletion, tropospheric ozone formation, and acid rain. Each is narrowly focused; none treat the atmosphere as an integrated whole.

Toward a Law of the Atmosphere: 1988-1992

The idea of uniting the array of international atmospheric agreements under a single umbrella convention first emerged in 1987 at the First North American Conference on Preparing for Climate Change. Howard Ferguson, then Assistant Deputy Minister of Canada's Atmospheric Environment Service (AES), had come up with the idea for a "Law of the Atmosphere" in 1986, and shared his idea in an address to the conference (Climate Institute 1987). His idea was promoted to a wider audience at a World Conference on the Changing Atmosphere held in Toronto in 1988. The Toronto Conference was attended by over 300 scientists and policymakers from 46 countries and organizations. The conference statement reads, "Humanity is conducting an unintended, uncontrolled, globally pervasive experiment whose ultimate consequences could be second only to global nuclear war" (WMO 1988, 292). The conference statement called for the development of an Action Plan for the Protection of the Atmosphere that "includes an international framework convention, encourages other standard-setting agreements and national legislation ... complemented by implementation of national action plans that address the problems posed by atmospheric change at their roots" (WMO 1988, 296). The conference statement also recommended the creation of a World Atmosphere Fund to finance the implementation of the Action Plan.

In 1989, a follow-up conference was held in Ottawa. Eighty legal and policy experts from around the world, representing government, non-government, and academic institutions, attended this Meeting of Experts. Its purpose was to develop the legal and institutional framework for a Law of the Atmosphere, as well as a 'lesser' convention on climate change. The development of both conventions simultaneously was a central recommendation of the Ottawa Meeting (Department of External Affairs 1989, 1). The

Meeting of Experts produced a set of draft principles that could form the basis of a Law of the Atmosphere, along with a second set of overlapping principles for a convention on climate change. The Law of the Atmosphere was drafted as a framework convention that addressed all threats to the global atmosphere; it designated the atmosphere "a common resource of vital interest to mankind" (Department of External Affairs 1989, 2). The meeting participants anticipated that the climate change convention, along with other existing atmosphere-related regimes, would be integrated into the Law of the Atmosphere once both were sufficiently developed.

The Toronto Conference and Ottawa Meeting were intended as preparatory conferences leading up to the United Nations Conference on Environment and Development (UNCED), or Earth Summit, held in Rio de Janeiro in 1992. The principles and components of a Law of the Atmosphere were to be ready for consideration at UNCED. While the proposal was discussed in various international meetings prior to 1992, it gained no further ground. Little attention has been paid to the idea of a Law of the Atmosphere since 1992. On the other hand, the 'lesser' UN Framework Convention on Climate Change (UNFCCC) was one of the crowning achievements of UNCED. The original plan to incorporate the climate change convention and other atmosphere-related international agreements into an overarching Law of the Atmosphere never came to pass. Why? The research question I seek to answer is: What factors explain why a Law of the Atmosphere failed to become a regime during its 1988 to 1992 window of opportunity? Or, to use a recently coined terminology: Why did the Law of the Atmosphere remain a "nonregime"?

The Law of the Atmosphere nonregime

In a recent paper, Dimitrov et al. (2007) argue for the establishment of a research agenda on nonregimes. They define a nonregime as "a transnational policy issue area characterized by the absence of multilateral institutions for ordering actors' interactions" (Dimitrov et al. 2007, 234). The authors maintain that nonregime theory is necessary to evaluate the findings of regime theory, and that causal arguments presented by regime theorists cannot be properly evaluated without the study of nonregimes. Regime theory has constituted a major research program within the discipline of international relations since the mid-1970s, focusing almost exclusively on the origin, function, and effectiveness of international regimes (Hasenclever, Mayer, and Rittberger 1997; Little 2008; Young 1999). Extensive research on successful cases of regime formation exists; however, as Dimitrov et al. argue, case studies of non-formation are nearly absent from the literature. The limited amount of work on nonregimes does not offer a systematic approach to nonregime theory and is only able to offer preliminary findings on factors hampering regime creation. The paucity of nonregime case studies strengthens the criticism that current regime literature lacks control groups. Regime theorist Arild Underdal (2002, 447) claims, "There is a real possibility that the entire field of regime analysis is biased in favour of positive findings." In this study, I classify the Law of the Atmosphere as a nonregime. While multilateral institutions exist for separate elements of the global atmosphere, there is no single multilateral institution responsible for governing actors' interactions relative to the atmosphere as a whole.

There is a caveat to how the term "Law of the Atmosphere" is used in this thesis. While it can be defined to incorporate environmental (e.g., air pollution control) and non-environmental (e.g., air traffic regulation) elements, I focus solely on the environmental

elements because there already exists a de facto Law of the Atmosphere for air traffic, the most significant non-environmental element. Global harmonization of air traffic is essential for safety and economic efficiency reasons. In addition, there exists a single international aviation authority, the International civil Aviation Organization (ICAO). No such harmonization or international organization exists for environmental issues.

Pursuing the Law of the Atmosphere as a nonregime study

Defining a Law of the Atmosphere as a nonregime provides a venue for employing the analysis set forth by Dimitrov et al. However, although they define nonregime and issue a challenge to develop a research agenda on nonregimes, they do not set forth a method for explaining nonregimes. They offer only a few brief suggestions for pursuing nonregime study, including a vague reference to 'inverting' theories of regime formation (Dimitrov et al. 2007, 253), but carry their development of a method no further. Therefore, the first step of my research was to create a substantive method to apply to my nonregime case study. In the next chapter (Chapter 2), I develop this method by extracting from three literatures relevant to the establishment of international environmental governing schemes factors that affect the likelihood of creating such schemes. I examined each of the regime, commons, and economic cooperation literatures, and extracted factors related to successful regime formation, commons governance, and international environmental cooperation. These were then synthesized to produce a single summary table of factors. This set could then be applied to my Law of the Atmosphere case study to determine the presence or absence of each factor and to analyse its relative influence on the nonregime outcome.

The second step of my research was to construct a table of key actors and a timeline of events that helped shape the fate of the Law of the Atmosphere (Chapter 3). The timeline

is divided into four sections. The first section runs from the signing of the 1979 Geneva Convention on Long-Range Transboundary Air Pollution (LRTAP) to the signing of the 1985 Vienna Convention for the Protection of the Ozone Layer. The second section covers 1985 to 1988, from the genesis of the idea for a Law of the Atmosphere to the first calls for a Law of the Atmosphere in smaller meetings. The third section spans the period of strongest support for a Law of the Atmosphere, beginning with the 1988 World Conference on the Changing Atmosphere and ending with the 1989 Ottawa Meeting of Legal and Policy Experts. The final section picks up after the Ottawa Meeting and ends in 1992 with UNCED.

The third step of my research was to identify the factors from the summary table that inhibited the Law of the Atmosphere from becoming a regime (Chapter 4). They were identified using document analysis and interviews, and constitute the answer to my research question.

The concluding Chapter 5 discusses the implication of my findings for nonregime research and for policymaking on the atmosphere as a whole. Nonregime theory identifies a significant gap in international relations theory. While enormous scholarly effort has gone into creating theories of regime formation, significantly less effort has gone into explaining why regimes fail to form. My research contributes to the new area of nonregime study by offering a methodology for the analysis of nonregimes and applying it to a case study of the Law of the Atmosphere. My research will also assist international policymakers. It sheds light on the complexities and challenges faced in governing the atmosphere and offers guidance on future efforts at formulating global policy for governing the global atmosphere.

Chapter 2: Methods

Introduction

There are two types of literature that are most relevant to the research topic of this thesis: the literature on the Law of the Atmosphere (relevant to the topic area of the thesis) and the literature on nonregimes (relevant to the methodology of the thesis). Literature on the Law of the Atmosphere is, for all practical purposes, nonexistent. To my knowledge, this thesis is the first research specifically devoted to this topic. There are only a handful of works that address the Law of the Atmosphere concept. These are cited in the later chapters (in particular, Chapter 3 and 4). The literature on nonregimes isn't much larger. This literature and the method used to analyse the Law of the Atmosphere as a nonregime case study is explained in this chapter.

As Dimitrov et al. (2007, 231) confirm, research on nonregimes is virtually absent from regime literature. The limited amount of study tends to be narrow in focus. For example, Dimitrov's (2002) studied the coral reef nonregime and Bessette and Haufleur's (2001) the information nonregime, but neither develops a methodology applicable to general nonregime study. Similarly, Dimitrov et al's (2007) proposal for a nonregime research agenda is not accompanied by a methodology. The first step of my research project, therefore, was to create a substantive methodology that could be applied to my nonregime case study.

A few theoretical and methodological considerations are offered by Dimitrov et al. for the pursuit of nonregime study. For example, "A systematic pursuit of [nonregime research] will likely involve contributions from diverse intellectual orientations" (Dimitrov et al. 2007, 252). While it may seem intuitive to simply analyse for the absence of factors that

regime theory deems conducive to regime formation, Dimitrov et al. advise that such a 'reversal' of regime formation analysis may not be sufficient for nonregime analysis. They note that factors influencing nonregime formation do not necessarily parallel factors leading to regime formation: "Researchers must be prepared to find variables that have typically been neglected or omitted" (Dimitrov et al. 2007, 254).

In order to achieve a more complete method for analyzing nonregimes, I incorporated two literatures, in addition to the regime formation literature, to increase the likelihood of detecting factors beyond those involved in a simple reversal of regime formation. There are numerous literatures that could potentially contribute to a more robust method. I selected those on commons theory and economic theory of international environmental cooperation. These literatures were chosen because, like regime theory, they deal with cooperation among sovereign actors in the absence of a central enforcement authority. Cross-disciplinary research between regime theory and commons theory (Keohane and Ostrom 1995), and regime theory and the economic theory of international environmental cooperation (Neumayer 2001), highlights the learning opportunities for regime theory offered in these literatures. I drew from these three diverse but related literatures on environmental governance in order to create my methodology for nonregime analysis.

In the next section, each literature area is introduced and a table of factors presented that has been identified from the given literature as conducive to successful construction of regimes, or governing of commons, or establishment of cooperation. I conducted a non-exhaustive search of each literature area to derive the factors listed in Tables 1.1, 1.2, and 1.3. Factors were initially gleaned from articles presenting summaries of a given literature area (e.g., for regime theory (Young and Osherenko 1993), for commons theory (Dietz,

Ostrom, and Stern 2003), and for economic theory of international environmental cooperation (Neumayer 2001)). Eminent authors who had identified relevant factors were noted and their original work tracked down. The three tables therefore represent a comprehensive yet preliminary codification of factors from each literature area, and are not intended to be taken as complete. Each factor listed is accompanied by a brief explanation. Since the number of authors cited for each factor is not large, and in some cases is a single author, in these explanations I used the voice of the authors whose factors I selected (i.e., I paraphrased from the original works cited in the "sources" columns of the tables). In this way, I am acknowledging the need for a more exhaustive search of the literature for all works that address a given factor. I must leave this exhaustive search as an area for "further research."

The three sets of factors (37 altogether) were then synthesized into nine summary factors. To arrive at this set of nine summary factors, I followed three general guidelines. First, categorization of factors was already present in much of the summary work on a literature area. For example, Young and Osherenko (1993) synthesize factors influencing regime formation into four categories: power, interest, knowledge, and context. In deciding the final nine summary factors, I utilized such categorization schemes already present in each literature area. Second, I took into account which factors a literature emphasized over others and which factors were less certain. Factors that were identified in the literature as extremely influential in regime formation (e.g., leadership) were candidates to be a summary factor, while those less influential or less certain factors were considered sub-factors. Third, there was some clear overlap in factors between the three literatures. Factors such as scientific knowledge and number of players were central in all three literatures.

The summary factors were created to reflect commonalities among the factors in each of the literature areas and simplify my nonregime method. They are presented in a summary table in the final section of this chapter.

Three literatures, three sets of factors

Regime theory

The first literature is the body of work within regime theory on regime formation. Regime theory emerged in the mid-1970s as a major focus within the discipline of international relations. Regime theorists explore the origin, function, and effectiveness of regimes (Hasenclever, Mayer, and Rittberger 1997; Little 2008; Young 1999). Regime theory has been viewed as a reconciliation of idealist and realist conceptions of interstate relations; that is, it assumes that norms influence state behaviour, but that such "norm-governed behaviour [is] wholly consistent with the pursuit of national interests" (Haggard and Simmons 1987, 492). The regime formation literature focuses on explanations for successful regime formation. Since factors identified in the regime formation literature that are missing relative to a given nonregime may help explain the existence of the nonregime, they are included in my method. Dimitrov et al. (2007, 253) point out that a simple inversion of theories of regime formation may explain nonregimes. Table 1.1 displays 21 factors derived from the regime formation literature, together with an explanation of the factor and citations to key sources, that scholars have identified as important to successful regime formation.

Table 1.1 Regime theory: Factors contributing to regime formation

Factor	**Explanation**	**Source(s)**
Hegemon	The international system is more stable when a there is a concentration of power resources in a single state (a hegemon). If a hegemon exists in a specific issue area a regime is more likely to form. If there is no hegemon, and power is dispersed, then regime formation is less likely since transaction costs rise. The hegemon dominates and leads in the issue and is supported by its superior share of power. There are two ways a hegemon may lead. A benign hegemon induces cooperation by taking a disproportionate share of costs for a higher payoff after a regime has formed. A coercive hegemon uses its power to form a regime and force others to comply.	(Krasner 1976; Keohane 1980)
Balance of power	A balance of power is maintained among states by constant counterbalancing of changes in international power. A balance of power among participating states encourages stability of their relations. Regime formation is more likely when states participating in the regime formation process have a roughly symmetrical distribution of power.	(Waltz 1979; Young and Osherenko 1993)
Integration	Integration among states usually begins in limited functional and economic areas. Integration generally increases over time and is difficult to reverse. If relevant states are well integrated and process a high density and wide spectrum of transactions, then regime formation is more likely.	(Mitrany 1975; Efinger, Mayer, and Schwarzer 1993)
Normative-institutional	A regime is more likely to form when an issue belongs to a policy area already structured by international institutions. Existing international organization influences regime formation by providing a forum for further development and setting a precedent for cooperation. Existing institutions also serve as models or focal points for creating a new regime.	(Rittberger and Zürn 1990; Efinger, Mayer, and Schwarzer 1993)

Issue properties	In dissensual conflicts, actors disagree on what is desirable for them individually and collectively. A dissensual conflict about values is the most difficult to regulate because values cannot be negotiated, while a dissensual conflict about means to achieve an agreed upon end is more likely to lead to regime formation. In consensual conflicts, actors all desire the same object, but no one can be fully satisfied. A consensual conflict about relatively assessed goods is difficult to regulate because it often sparks intense competition, while a consensual conflict about absolutely assessed goods is more likely to lead to regime formation.	(Rittberger and Zürn 1991)
Integrative bargaining and veil of uncertainty	Integrative bargaining aims to combine negotiators' interests to produce a higher payoff for all parties. Integrative bargaining requires a negotiating climate favourable to contractarianism. Contractarianism holds that norms derive their force from mutual agreement. The veil of uncertainty is an important element of integrative bargaining and refers to a party's uncertainty about its position over time. A thick veil of uncertainty helps ease regime negotiations.	(Young 1989; Young and Osherenko 1993)
Equity	Articulation of institutional options that all parties accept as equitable contributes to regime formation. Parties will make some sacrifice in efficiency in order to achieve an equitable solution. A solution that features equal sacrifice for all parties is more likely to be accepted.	(Young 1989; Young and Osherenko 1993)
Salient solutions	The existence and appeal of simple or familiar solutions helps regime negotiations to succeed. Salient solutions offer uncomplicated formulas that are intuitively appealing or borrow familiar formulas from prior cases. They can also be easily explained to policymakers and the general public.	(Schelling 1980; Young and Osherenko 1993)
Exogenous shocks or crises	The occurrence of shocks or crises separate from the regime negotiating process increases the likelihood that the regime will form. Exogenous shocks and crises may help promote agreement on the terms of a contract. Crises may be manufactured by non-governmental organizations or the media. The media may also enhance the effects of exogenous shocks or crises on regime formation.	(Young 1989; Young and Osherenko 1993)

Policy priority	There are two contrary lines of research on the influence that an issue's priority on the policy agenda has on regime formation. First, priority on the policy agenda can contribute to success in regime formation, and second, a regime is more likely to form when it is not high priority on the agenda of parties.	(Young and Osherenko 1993)
Common good	The common good refers to the considerations of morals and ethics in governing common property. The choice by a state to set aside national interests in favour of the common good helps regime formation succeed. Success is also encouraged by states widening their interests to include the common good.	(Soroos 1988; Young and Osherenko 1993)
Science and technology	The tendency of negotiating parties to focus on scientific issues increases the likelihood of regime formation. A regime is also more likely to form if parties with scientific backgrounds have a larger role in negotiations. An issue that is more technical as opposed to political is also more conducive to regime formation.	(Young and Osherenko 1993)
Relevant parties	Every stakeholder must participate or be represented in regime negotiations to help achieve success and a lasting agreement. If all stakeholders are not present in critical stages of negotiations, then an excluded party may refuse to accept or even sabotage negotiations and/or the agreement.	(Adler and Haas 1992)
Compliance mechanisms	The availability of clear-cut and effective compliance mechanisms help to ease institutional bargaining and promote regime formation. Compliance mechanisms aid in overcoming the common concern that other players will fail to comply with the terms of the regime. Compliance mechanisms vary substantially from decentralized to centralized systems of implementation to increased transparency for easier detection of violations.	(Axelrod 1985; Young and Osherenko 1993)
Scientific convergence	A common and widely understood conception of the causes of a problem and suitable responses clears the way to regime formation. Scientific consensus on the cause-and-effect relationship of an environmental issue encourages international cooperation. Some theorists argue that international cooperation occurs almost spontaneously with scientific convergence on an issue.	(Cooper et al. 1989; Young and Osherenko 1993)

Epistemic communities	An epistemic community is a network of professionals with recognized expertise in a particular domain that frames and articulates a problem and its solutions. Regime formation is encouraged when an epistemic community arises in an issue area. The epistemic community communicates with policymakers to convey their understanding of the issue and can often influence the form of regime options. An epistemic community offers consistent, authoritative and informed advice to reduce uncertainty in the issue area.	(Haas 1992; Young and Osherenko 1993)
Contextual factors	Opportunities provided by events and conditions unrelated to the issue under consideration may influence the likelihood of regime formation both positively and negatively. Large national and international events may influence regime formation even when they do not fall into the same policy area. Contextual factors can affect the timing and content of a regime in the process of formation.	(Young and Osherenko 1993)
Individuals as leaders	The presence of strong and consistent individual leadership leads to regime formation. Individuals who exercise leadership aim to overcome collective-action problems by promoting regime formation to involved parties. There are different forms of individual leadership that can be exercised (even simultaneously) in regime negotiations, but only the emergence of some form of individual leadership is necessary to increase the likelihood of regime formation.	(Young 1991)
Cognitive factors	Cognitive theory explores the limits of human rationality and brings certain judgemental heuristics and biases into focus. Cognitive factors have been identified that influence regime formation. The development of trust is a cognitive factor that allows the cooperative aspects of a given bargaining situation to prevail over the conflicting aspects of the situation, thus making regime formation more likely. Another cognitive factor that makes regime formation more likely is convergence around a formula; that is, a shared perception or definition of a problem.	(Jönsson 1992)

Domestic sources	Analysis of domestic sources of regime formation brings regime analysis down to the actor level and considers the role of societal forces. A trading state has a competitive economy, a high dependence on foreign trade and does not have abundant traditional power resources. If more trading states act in an issue area, regime formation is more likely. A domestic structure that is 'corporatist' has a relatively high share of public revenues, a medium degree of state strength and stronger degree of centralization in organization of societal interests, and a strong social democratic electorate. If more states in an issue area have a corporatist domestic structure, regime formation is more likely. Regime formation is also encouraged as more reformist changes take place (short of revolution) in the governing coalitions in the issue area. Lastly, regime formation is more likely if the number of domestic groups in the issue area likely to benefit from policy change is greater than the number of domestic groups that benefit from the status quo.	(Zürn 1994)
Favourable intellectual climate	Intellectual traditions are the set of ideas, values, and images that prevail in a given society. Intellectual traditions shape the formation of regimes, and a favourable intellectual climate helps a regime to form. If obstructionist intellectual traditions decline, then regime formation is more likely. Intellectual traditions decline when competing intellectual traditions rise, when intellectual traditions lose their institutional homes (at state, transnational and societal levels), and through empirical invalidation.	(Corrales and Feinberg 1999)

Commons theory

The second literature I drew on for my methodology is commons governance, which analyses the design of strategies and institutions to sustainably govern collectively owned, or common-pool, resources. Common-pool resources are characterized by low excludability and high subtractability; that is, excluding consumers of a resource is difficult, and consumption of the resource subtracts from the total amount available for others (Ostrom 2008). The origin of the commons literature can be traced to Garrett Hardin's (1968) classic article, "The tragedy of the commons." Hardin explored what are now referred to as "open-access

resources," a subcategory of common-pool resources. Even though Hardin's pessimistic conclusion of the inevitable destruction of the commons (i.e. open-access resources) has been disputed and revised by many successive commons theorists, it has provoked prodigious research effort. I draw upon the commons literature because the object of my study, the atmosphere, is a common-pool resource. In addition, the literature on commons governance emphasizes the characteristics of the resource itself, along with the characteristics of those drawing on the resource.

Research on common-pool resources has identified features of a commons that make governance easier and more likely to succeed, and requirements and principles for effective governance, including design principles for governing institutions. As a whole, commons theory tends to focus on local and regional arrangements rather than on global arrangements. As a result, factors that lead to the emergence of a global commons governance scheme (i.e. global regimes) have not been fully explored by commons theorists. However, the plethora of studies by commons theorists on the emergence of institutions for governing natural resources is relevant to this study in that some of the characteristics of local and regional common-pool resource management can logically be applied to global resources like the atmosphere (Heikkila and Gerlak 2005; Keohane and Ostrom 1995). Table 1.2 displays nine factors derived from the commons literature, together with an explanation of the factor and citations to key sources, that scholars have identified as important to successful commons governance.

Table 1.2 Commons theory: Factors contributing to commons governance

Factor	Explanation	Source(s)
Social capital	Social capital is based on material and symbolic relations of exchange, and can be institutionalized. Social capital can be used to mobilize a social network, and the greater the amount of social capital the greater the ability to mobilize. Social capital is highest when social bonds are strong, communication between resource users is frequent, and social networks are dense. Social networks function as platforms for the exchange of ideas and mutual encouragement for participation. Resource-users that interact and trust one another are more likely to cooperate to govern a commons.	(Ostrom 1998; Pretty 2003; Dietz, Ostrom, and Stern 2003)
History of user organization	Resource users with a history of interaction and prior experience with at least minimal levels of organization are more likely to cooperate to govern a commons. Prior experience can be through the presence of a general purpose organizational structure (e.g. a village council), or a specialized organizational structure related to the resource, but without prior management responsibilities (e.g. an airplane club). Experience with organization can also be fulfilled by the presence of nearby organizations that have helped others govern similar commons issues.	(Ostrom 1990; Taylor and Singleton 1993; Ostrom 1992)
Resource characteristics	Successful commons governance is easier when the resource is small, uniform, simple and predictable. A smaller size usually means fewer users and makes the resource easier to monitor. Other resource characteristics that aid in commons governance are a relatively small number of negative externalities from resource use and the ability to discern stable and well-delineated boundaries around the resource. If a resource is part of a complex system, it is more difficult for resource-users to agree on rules to address the numerous externalities. Clear boundaries make identification of resource-users and the extent of their use easier to determine. Resources that are time dependent are less likely to be governed than those that are not. That is, a renewable resource with a replacement rate that grossly exceeds the withdrawal rate, or a resource with a withdrawal rate that grossly exceeds the replacement rate to the current point of near-destruction is less likely to be governed.	(Ostrom 1990, 2001; Dietz, Ostrom, and Stern 2003; Schlager, Blomquist, and Tang 1994; Dolšak and Ostrom 2003)

Resource-user characteristics	Resource-users are most likely to create common-property institutions when the number of users is small enough to keep communication and decision-making costs low and when appropriators reside permanently near or in the resource. At the local level, a lower degree of homogeneity among resource-users makes users more likely to organize to govern a commons. At the global level, heterogeneity in capabilities, preferences, and information and beliefs usually facilitates cooperation but occasionally may not, depending on the context. Resource-users that share a long-term vision for the resource and its benefits are better able to successfully govern a commons. A moderate to heavy level of resource use also encourages resource-user cooperation, as they attempt to prevent overuse.	(Keohane and Ostrom 1995; Ostrom 1992; Adams et al. 2003)
Knowledge and information	Successful commons governance is easier when the dynamics of the resource are well-understood, including the stocks, flows, and processes within the resource system and the human-environment interactions that affect the resource system. Information should be verifiable, and it must be congruent with decision-makers' needs and the scale of the particular decision or event. Information must include scientific uncertainties and individual and societal values related to the resource.	(Ostrom 1990; Dietz, Ostrom, and Stern 2003; Dolšak and Ostrom 2003)
Support for monitoring and enforcement	Commons governance is helped by users that support monitoring and enforcement to provide strong incentive to obey rules. Effective commons governance requires that rules be followed, and it is generally most effective to impose modest sanctions on first time offenders and gradually increase sanctions for repeat offenders. Enforcement mechanisms may be formal or informal, but must be imposed by a source viewed by resource-users as legitimate. Financial instruments that encourage rule compliance are often more effective than 'command and control' systems, where compliance is regulated and rule-breakers are punished.	(Trawick 2001; Dietz, Ostrom, and Stern 2003)
Strong leadership	Strong leaders help establish and encourage collective action to govern a commons. Leaders, or mobilizers, issue empowerment messages that emphasize the value of collective action and the importance of individual efforts coordinated with others. Empowerment messages raise expectations of the contribution that others will make, and can help jump start collective action to govern and protect a commons.	(Blomquist 1992; Vasi and Macy 2003)

Costs vs. benefits	Cooperation to govern a commons is more likely when the cost of collaboration is less than the cost of individual action. If a resource is perceived to be valuable and worth the cost of management, then resource-users are more likely to create an organization for its protection. The perceived benefits of organization must also be higher than the perceived costs of organization. The perception that there are high benefits of organization are most likely to arise when resource-users have full and accurate information about resource dynamics, the benefits and costs of various actions and outcomes, and the history and reliability of other resource-users.	(Taylor and Singleton 1993; Kadekodo 2004)
Authority	Resource-users must have the authority to govern a commons in order to successfully establish rules for its protection. Resource-users may establish a set of rules to govern a commons, but external authorities must give them at least minimal recognition of the rights to organize. If resource-users have the authority to organize to govern a commons, they are protected against outside interference or overturning of their rules by external authorities.	(Ostrom 1990)

Economic theory of international environmental cooperation

The third literature I include in my nonregime methodology is drawn from the discipline of economics. Literature from the economic theory of international environmental cooperation utilizes economic reasoning to understand and predict international cooperation under anarchic conditions.

Kenneth A. Oye's (1985, 2) seminal book *Cooperation under anarchy* laid the groundwork for the economic theory of international environmental cooperation, based in the "austere abstractions of game theory and microeconomics." The economic theory of international environmental cooperation analyses and provides insight into the likelihood and strength of cooperation, and strategies for altering both of these variables. Dimitrov et al. (2007, 252) recommend game theoretic analysis because rejected moves and outcomes may be explanations for the existence of a nonregime. This literature was included in my

nonregime methodology because it constructs "a tractable model that results in testable propositions" (Neumayer 2001, 124), and because the "elegance and explanatory power" of its models contrasts with the more open and versatile approaches taken in regime and commons theory (Neumayer 2001, 141). Table 1.3 displays seven factors derived from the international environmental cooperation literature, together with an explanation of the factor and citations to key sources, that scholars have identified as important to successful environmental cooperation.

Table 1.3 Economic theory: Factors contributing to international cooperation

Factor	Explanation	Source(s)
Payoff structure	Game-theoretic analysis deals with strategic behaviour, where a player's success is dependent on the actions of other players. It assumes that there is a unitary actor supplied with a clear payoff matrix. With numerical values, the payoff matrix specifies the benefits of mutual cooperation, mutual defection, unilateral defection, and unrequited cooperation. Each player weighs their choices relative to the potential choices of others and makes a rational decision based on all available information. International cooperation is likely to occur when its payoff is perceived by players as the best and most rational choice.	(Oye 1985; Barrett 1990, 1997)
Free-rider deterrence	International cooperation to create a regime is more likely to be successful when the terms of the agreement are able to deter free-riders. Free-riders benefit from the terms of the agreement while incurring no costs of their own. Free-riding may be internal and carried out by signatories to the agreement through non-compliance with its terms. Free-riders may also be external to the agreement. To achieve free-rider deterrence, an agreement must be self-enforcing; that is, recourse to an external authority for enforcement is not possible since parties cannot be forced to sign and comply with an agreement. Some self-enforcing agreements employ mechanisms such as economic sanctions and credible threats. Deterrence mechanisms must outweigh the benefits of free-riding by causing proportionately more damage.	(Barrett 1990)

Renegotiation-proof	A regime that is renegotiation-proof has higher prospects for formation. A renegotiation-proof agreement requires a state (or states) make a credible threat on a free-riding state that is not compliant with the terms of the regime. To make the threat credible, a state must not end up worse off after executing the punishment on the free-riding state than it would be without carrying it out. The state must be better off executing the punishment than renegotiating the terms of the regime with the free-rider. Agreements must be renegotiation-proof or free riders will escape without punishment and expect a new agreement in its place.	(Finus and Rundshagen 1998)
Model uncertainty	Model uncertainty occurs when players do not understand a problem in its full complexity and have incomplete information about their payoff relative to others. Model uncertainty can detract from regime formation because states can use it to disguise their true reasons for opposition to regulation (usually based on national interests). Model uncertainty provides a safe haven from which states can oppose regime formation on the grounds of 'not proven.'	(Helm 1998)
Issue linkage	Linking negotiations of disparate issues expands the zone of possible agreement. Issue linkage strengthens incentives for cooperation by linking together different issues, with each issue having a different payoff matrix for each player involved. Issue linkage is most able to promote cooperation when the states involved have markedly asymmetric preferences. Issue linkage works best when one set of players value cooperation in one issue and not in another, while another set of players value the opposite. Linking issues is more profitable than separate negotiations and can deter free-riding while making agreements more stable.	(Cesar and Zeeuw 1996; Barrett 1997; Carraro and Siniscalco 1997)
Number of players	A small number of players are more likely to cooperate to form a regime because they are able to sustain full cooperation in a self-enforcing agreement. An agreement among a large number of players can only improve marginally on the outcome of non-cooperation. Large-scale cooperation is difficult to achieve and usually does not produce significant results. An agreement involving a large number of players is either narrow instead of wide or shallow instead of deep. Issue linkage makes large-scale cooperation more likely.	(Barrett 1999)

Side payments and transfers	Side payments and transfers are designed as strategic incentives to promote cooperation. They involve a payment or transfer from one or more parties in an agreement to other parties to induce cooperation and inclusion in the agreement. The prospect of side payments or transfers may reduce a player's incentive to sign an agreement, since the player will benefit from payments and transfers from outside of the agreement. But side payments also make cooperation possible when players have heterogeneous views on an issue or costs are unequal.	(Kaitala and Pohjola 1995; Hoel and Schneider 1997; Botteon and Carraro 1997; Compte and Jehiel 1997; Wirl, Huber, and Walker 1998)

Summary of factors contributing to regime formation

The list of almost 40 factors in Tables 1.1, 1.2, and 1.3 provides a comprehensive, though undoubtedly incomplete, set of elements that potentially can contribute to regime formation, where "regime formation," as I am using the term, it is equated to not only successful regime formation but also successful commons governance and successful environmental cooperation. These factors were compared and commonalities identified. Based on the identified commonalities, a set of nine summary or 'super-factors' were created (Table 2). These summary factors transform the long list into a clearer and more manageable set that I used for analysis of the Law of the Atmosphere nonregime in the following chapters.

Table 2. Summary factors contributing to regime formation

Summary Factor	Explanation	Factors	
Power	Certain configurations of power among actors can encourage regime formation.	▪ Hegemon ▪ Authority	▪ Balance of power
Knowledge	The state of scientific knowledge in the issue area and the level of cooperation of the scientific community influence regime formation.	▪ Science and technology ▪ Scientific convergence ▪ Epistemic communities ▪ Model uncertainty	▪ Favourable intellectual climate ▪ Knowledge and information ▪ Cognitive factors
Leadership	The presence of a strong and consistent individual or state leader who champions an issue influences regime formation.	▪ Individuals as leaders	▪ Strong leadership
Interest and payoff	Each actor weighs its best interests and payoff relative to other actors. If regime formation is in an actor's interest and offers an acceptable payoff, then a regime is more likely to form.	▪ Costs vs. benefits ▪ Payoff structure ▪ Issue linkage ▪ Common good ▪ Relevant parties ▪ Compliance mechanisms	▪ Free rider deterrence ▪ Side payments and transfers ▪ Integrative bargaining and veil of uncertainty ▪ Renegotiation-proof
Issue characteristics	The nature of the issue in question and the ease of governance influences regime formation.	▪ Issue properties	▪ Resource characteristics
Resource-user characteristics	The characteristics of users that draw on a resource influence the likelihood of regime formation.	▪ Domestic sources ▪ Social capital ▪ History of user organization	▪ Support for monitoring and enforcement ▪ Resource-user characteristics ▪ Number of players
Available solutions	The solutions, especially institutional options, available to address an issue affect regime formation.	▪ Equity	▪ Salient solutions
Policy area	The issue under consideration can be categorized into a larger set of issues. This policy area and its governing institutions influence regime formation.	▪ Integration ▪ Normative-institutional	▪ Policy priority
Context	Issues and events separate from the issue under consideration affect regime formation.	▪ Exogenous shocks or crises	▪ Contextual factors

Putting the factors to work

The table of nine summary factors is the foundation for my methodology for nonregime analysis. In chapter four, the presence or absence of each factor is determined and its relative influence on the nonregime outcome analysed. Factors are categorized as having a high, moderate, or low level of influence. The presence or absence of a factor and its relative influence were established through interviews and document analysis. Five people were interviewed (Appendix 1). I used participant lists of meetings related to the Law of the Atmosphere to identify those who may have been involved in the Law of the Atmosphere debate. Given the time that has elapsed since these meetings it proved to be very difficult to track people down. Many times I ended up discovering that a person I was seeking had passed away. Once I was able to contact someone, I asked if there was anyone else who it would be worthwhile to get in touch with. Despite enormous effort to find participants active in the Law of the Atmosphere debate, in the end, I was able to locate and interview only five people. The interviews were semi-structured, and all were recorded and conducted by telephone. See Appendix 1 for a list of interview questions. Material from these interviews and from a small set of primary and secondary documents are explained over the course of the next two chapters. The factors identified from this process and their influence constitute the answer to my research question.

Chapter 3: Birth and death of the Law of the Atmosphere: A timeline

Introduction

In this chapter, a timeline relevant to the quest for a Law of the Atmosphere is presented. Key players and events are highlighted. The timeline provides the context for my analysis in the next chapter. The timeline is divided into four periods. The first period begins in 1979 with the creation of the LRTAP Convention to address the acid rain problem and ends with the creation of the Vienna Convention for the Protection of the Ozone Layer in 1985 to address the stratospheric ozone depletion problem.[1] The second period runs from 1985 to 1988, beginning with the genesis of the idea for a Law of the Atmosphere to its first calls in smaller forums. Canada and the United States (US) emerged as the key state-level players in the life of the Law of the Atmosphere idea. The third period spans the time during which the idea for a Law of the Atmosphere enjoyed its strongest support, from the 1988 Toronto Conference to the 1989 Ottawa Meeting. The call for a Law of the Atmosphere was first made on the world stage at the Toronto Conference. Three atmospheric issues propelled this conference: acid rain, stratospheric ozone depletion, and climate change. Each was the topic of a theme paper summarized in the conference statement, and each was addressed by the three keynote speakers: Canadian Prime Minister Brian Mulroney, Norwegian Prime Minister Gro Harlem Brundtland, and Canadian Minister of the Environment Tom McMillan (WMO 1988). The fourth and final period runs from the end of Ottawa Meeting to the UNCED in 1992. Each of the four periods is discussed in a separate section.

[1] Even though the 1963 Partial Test Ban Treaty was the first international treaty created for global atmospheric governance, it is not included in this timeline because it had little or no influence on the Law of the Atmosphere process. Little reference was made to it at the Toronto Conference, and participants did not expect that it would be included in a Law of the Atmosphere.

Period 1: 1979-1985, LRTAP Convention to Vienna Convention

1979 Geneva Convention on Long-Range Transboundary Air Pollution

The first regional treaty designed to govern and protect against a threat to the atmosphere, the LRTAP Convention, was signed in 1979. The roots of the convention extend back to the late 1960s when Swedish soil scientist Svante Odén first published a study tracing the acidification of Scandinavian lakes to sulphur emissions from Britain and Continental Europe (Odén 1967, 1968), thus identifying the large-scale atmospheric problem that came to be called "acid rain." Throughout the 1970s, scientific studies continued to support the hypothesis of long-range, transboundary transport of air pollution, illuminating the need for international cooperation to combat acid rain. In response, the LRTAP Convention was negotiated under the auspices of the United Nations Economic Commission for Europe (UNECE). The convention was signed by 34 governments and the European Community. Its aim was "to protect man and his environment against air pollution and ... endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution" (UNECE 1979). It was a "framework convention," meaning that the convention was intended to provide a framework for addressing the problem but that specific measures would be enacted through protocols.

During the time period under consideration in this thesis, protocols were signed in 1985 (Helsinki Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes By At Least 30%), in 1988 (Sofia Protocol concerning the Control of Nitrogen Oxides or their Transboundary Fluxes), and in 1991 (Geneva Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes). The ongoing issue of acid rain addressed in the LRTAP Convention was a major influence on the

perceived need for a Law of the Atmosphere, and the convention's framework-protocol structure served as a model for international response to atmospheric problems.

1982 Third UN Conference on the Law of the Sea

The UN Convention on the Law of the Sea (or, Law of the Sea, for short) was the product of the third UN Conference on the Law of the Sea (UNCLOS III) that began in 1973 and concluded in 1982. The Law of the Sea is a comprehensive regime for all uses and resources of the world's oceans and seas, and has a history that extends back to 1958 when UNCLOS I was held. UNCLOS I adopted four conventions: Convention on the Territorial Sea and Contiguous Zone, Convention on the High Seas, Convention on Fishing and Conservation of the Living Resources of the High Seas, and Convention on the Continental Shelf.

UNCLOS II took place in 1960 to resolve remaining contentious issues, but no new agreements resulted. The conference was reconvened in 1973 (UNCLOS III), and negotiations continued for the next nine years. UNCLOS III was a "global diplomatic effort to regulate and write rules for all ocean areas, all uses of the seas and all of its resources" (Division for Ocean Affairs and Law of the Sea 2009). Factors that drove the need to develop a comprehensive treaty for the world's oceans included the vastly increased intensity of ocean uses, an accelerating trend toward conflicting ocean claims, and the inadequacy of existing international law to handle these problems (Sebenius 1984, 11).

More than 160 states participated in UNCLOS III. The resulting convention (the Law of the Sea) was signed in 1985. Its most significant features relate to navigational rights, territorial sea limits, off-shore economic jurisdiction, legal status of resources on the seabed beyond the limits of national jurisdiction, passage of ships through narrow straits,

conservation and management of living marine resources, protection of the marine environment, marine research, and a binding procedure for settlement of disputes between states (Division for Ocean Affairs and Law of the Sea 2009). The duration, complexity, and problems of the Law of the Sea negotiations would later heavily influence reaction to the idea for a Law of the Atmosphere. Sebenius (1991, 123) identified four factors that "virtually guaranteed" the long duration of the Law of the Sea process, and that could do the same for a Law of the Atmosphere: (i) virtually universal participation; (ii) a powerful set of rules and understandings aimed at making all decisions by consensus, if at all possible; (iii) a comprehensive agenda; and (iv) the agreement to seek a single convention that would constitute a "package deal." To further add to negative perceptions of the Law of the Sea, three major industrial powers refused to accede to the treaty: Germany, Britain, and the US (Sanger 1986). In 1994 and 1997 respectively, Germany and Britain ratified the Law of the Sea. To date, the US still has not (Division for Ocean Affairs and Law of the Sea 2009).

The Law of the Sea entered into force on November 16, 1994, twelve months after its sixtieth ratification, and 12 years after the conclusion of UNCLOS III. Thus, during the time when a Law of the Atmosphere was under active consideration, the Law of the Sea was still in limbo.

1985 Vienna Convention for the Protection of the Ozone Layer

The roots of the stratospheric ozone depletion issue and its associated Vienna Convention trace back to James Lovelock's detection of the presence of chlorofluorocarbons (CFCs) in remote locations of the Earth's atmosphere in 1971 and to Rowland and Molina's Nobel Prize-winning research that shed light on the process by which CFCs destroy ozone molecules in 1974 (Ozone Secretariat 2000). Although the Rowland-Molina hypothesis

remained disputed until the late 1980s, the serious potential consequences of the diminishing stratospheric ozone layer combined with the growing use of CFCs worldwide proved enough to spark an international response. The United Nations Environmental Programme (UNEP) became a leader and in 1981 convened an ad-hoc working group to design a global framework convention. This led to the 1985 Vienna Convention for the Protection of the Ozone Layer, signed by 28 states, which set out general guidelines for cooperation in research, monitoring, and information sharing, and procedures for adoption of protocols and amendments (UNEP 1985). Hard targets for CFC reduction were not set in the Vienna Convention; these would come later under the Montreal Protocol and its three amendments, discussed in the next section (Period 2). Like acid rain, the issue of stratospheric ozone depletion helped set the stage for the 1988 Toronto Conference on the changing atmosphere.

Start of climate change politicization

Climate change was the third main atmospheric issue addressed at the Toronto Conference. At first, climate change was a concern only among scientists; it did not become a concern to policymakers until the end of Period 1 in 1985. The First World Climate Conference (WCC-1), convened by the World Meteorological Organization (WMO), was the first major international meeting on climate change. It took place in Geneva in February 1979 and was attended by scientists from around the world. The conference declaration identified increasing concentrations of carbon dioxide in the atmosphere from burning fossil fuels, deforestation, and changes in land use as the leading cause of climate change, and warned that continued expansion of human activities "may cause significant extended regional and even global changes of climate" (WMO 1979, 709). Governments were called upon "to foresee and prevent potential man-made changes in climate that might be adverse to the well-

being of humanity" (WMO 1979, 711). Conference participants did not go as far as to recommend international political action.

The first call in an international forum for a policy response to climate change was made at the 1985 Conference on the Assessment of the Role of Carbon Dioxide and Other Greenhouse Gases in Climate Variations and Associated Impacts, held in Villach, Austria and sponsored by the WMO, UNEP, and the International Council for Scientific Unions (ICSU). The Villach conference statement reads, "it is now believed that in the first half of the next century a rise of global mean temperature could occur which is greater than any in man's history" (WMO 1986), and issued a recommendation that policymakers work with scientists to explore policy options.

The conference statement also called for the creation of a small task force on greenhouse gases with a mandate to (i) help ensure that appropriate agencies and bodies follow up its recommendations, (ii) ensure periodic assessments are undertaken of the state of scientific understanding and its practical implications, (iii) provide advice on further mechanisms and actions required at the national or international levels, (iv) encourage research in developing countries to improve energy efficiency and conservation, and (v) initiate, if deemed necessary, consideration of a global convention (WMO 1986). This led to the creation of the Advisory Group on Greenhouse Gases (AGGG), consisting of seven eminent scientific experts, at a WMO/UNEP/ICSU-sponsored meeting also in 1985. The AGGG's first meeting took place in July 1986. The AGGG would serve a very active and influential role as an advisor to governments until its phase-out in 1990 (Boehmer-Christiansen 1996; Agrawala 1999). Because the AGGG's mandate included considering the

need for a global climate change convention, it was an important player in the story of the Law of the Atmosphere.

Summary

During Period 1 (1979-1985), three large-scale atmospheric issues coalesced to bring political attention to the human influence on the atmosphere—acid rain, stratospheric ozone depletion, and climate change—and served to heighten the potential need for a Law of the Atmosphere. Climate change was the only one without an existing convention. In addition, the 1982 Law of the Sea resulting from the almost decade-long UNCLOS III provided a model for a comprehensive environmental regime; however, it would not enter into force until 1994.

Period 2: 1985-1988, Genesis of idea for a Law of the Atmosphere

A first wave of environmentalism characterized by the rise of domestic environmental movements ran from the late 1960s to the mid-1970s, and a second wave characterized by the rise of international and global issues such as acid rain, stratospheric ozone depletion, climate change, loss of biodiversity, threats to rainforests, and emergence of the concept of "sustainable development" began in the mid-1980s and extended into the mid-1990s (Paehlke 1997). The remainder of the events discussed in this timeline took place during this second wave.

The 1987 report *Our Common Future* by the World Commission on Environment and Development, better known as the Brundtland Commission after the name of its chair, Gro Harlem Brundtland, introduced the notion of sustainable development and heightened the profile of global environmental issues which launched the second wave (Commission on

Environment and Development 1987). Because sustainable development tied together environmental and poverty issues, it struck a chord with developing nations. This idea was both novel and attractive, and garnered such significant support that it was made the centrepiece of UNCED. The Brundtland Commission also played an indirect role in the Law of the Atmosphere story.

Canada: Source and leader for a Law of the Atmosphere

The idea for a Law of the Atmosphere came out of Environment Canada's AES. In 1986, Tom McMillan, Canada's Minister of the Environment, appeared before the Brundtland Commission and offered to host an international conference on an aspect of global change. The result was the 1988 Toronto Conference on the changing atmosphere. Howard Ferguson, who served as Assistant Deputy Minister of AES from 1986 to 1989, was appointed Director of the Toronto Conference. During consultations for the conference, Ferguson shared his idea for a Law of the Atmosphere with conference organizers (Smith 2001). It drew support from both the Minister and the Prime Minister, both of whom would go on to promote it in their keynote speeches.

Canada became the strongest state supporter of the Law of the Atmosphere. Canada's leadership on the Law of the Atmosphere overlaps with its leadership on climate change. It viewed a Law of the Atmosphere as an umbrella solution for all atmospheric problems, including the immediate problem of climate change. The need for international regulation on climate change, along with the ongoing development of protocols for acid rain and stratospheric ozone depletion, paved the way for the suggestion of a Law of the Atmosphere as a broad solution. Canada was able to assume a leadership position because of the technical and function expertise in Environment Canada, especially in AES (Smith 2001). Extensive

scientific and political work on international atmospheric issues had been carried out by members of AES, and its members were at the forefront of international negotiations on the acid rain, stratospheric ozone depletion, and climate change issues (Smith 2001).

1987 Montreal Protocol on Substances that Deplete the Ozone Layer

The Vienna Convention was created in 1985 as a framework treaty intended to be strengthened by protocols. Negotiations for a protocol advanced significantly with publication of the famous 'ozone hole' paper only two months after the Vienna conference, in which researchers with the British Antarctic Survey unveiled remarkable evidence of major declines in stratospheric ozone concentration over the Antarctic in the spring (Farman, Gardiner, and Shanklin 1985, 210). The discovery of the Antarctic ozone hole produced a sense of urgency in protocol negotiations, and quickly led to the Montreal Protocol in 1987. The Montreal Protocol was designed to adapt to evolving scientific knowledge. During the window of opportunity for a Law of the Atmosphere, the Montreal Protocol would be subjected to one adjustment, the 1990 London Amendment. The London Amendment strengthened the Protocol by adding more ozone-depleting chemicals to the phase-out schedules and establishing a mechanism for financial and technical assistance to developing country parties. The achievements and relative ease of protocol negotiations directly influenced and inspired supporters of a Law of the Atmosphere. On the other hand, they also spoke to the merits of a framework-protocol approach over a comprehensive treaty.

First calls for a Law of the Atmosphere

Workshops were held in Villach, Austria and Bellagio, Italy in 1987 (Workshops for Developing Policies for Responding to Climatic Change) to build on the consensus reached

at the 1985 Villach conference. The workshops were endorsed by the WMO, UNEP, and the ICSU as part of the policy development process for climate change and by the AGGG as a step toward fulfilling its mandate to ensure follow-up action on the 1985 Villach recommendations. The 1987 Villach Workshop provided a technical basis for exploring further policy steps at the later Bellagio Workshop. Priorities for policy action were produced at the Bellagio Workshop and included development of a Law of the Atmosphere (Jäeger 1988). Howard Ferguson, a participant at the Bellagio workshop, was responsible for drawing attention to the Law of the Atmosphere and its inclusion in the Bellagio policy recommendations (interview with Howard Ferguson, October 27, 2009).

Meanwhile, the First North American Conference on Preparing for Climate Change took place from October 27-29, 1987 during the interval between the 1987 Villach and Bellagio workshops. It was sponsored by the Washington, DC-based Climate Institute, which made the claim that the gathering represented the first time that climate researchers had met with a broad array of policymakers, and that both global warming and stratospheric ozone depletion were addressed (Tangley 1988). Howard Ferguson also attended this conference, and in his address, he first voiced the need for a "broader Law of the Atmosphere" (Climate Institute 1987, 99). He argued that a Law of the Atmosphere would solve what he saw as a major ongoing problem with international regulation, the tremendous lag time between the planning of any significant environmental action and that action's implementation. A call to international policy action on climate change was also made by honorary co-chairmen of the climate conference, Senator George Mitchell (Democrat, Maine) and Senator John Chafee (Republican, Rhode Island). They announced plans to introduce a resolution in the US Congress calling for an international convention on climate change.

Emerging American position on a Law of the Atmosphere

The reaction of the US to a Law of the Atmosphere was particularly important because the US was the largest emitter of greenhouse gases in the world. In 1988, the US was responsible for approximately one-fourth of the world's greenhouse gas emissions, with per capita emissions among the highest in the world (Energy Information Administration 2006). The success or demise of efforts to govern the global atmosphere would be heavily influenced by US reaction. The US held substantial financial and technological resources that could sway both developed and developing nations to follow its lead for or against an issue (Harris 2000).

The election of President Ronald Reagan in 1980 marked the end of a decade of progressive environmental action and legislation in the US, which included the establishment of its Environmental Protection Agency in 1970, creation of a national climate change research program in 1978, clean air legislation in 1970 and 1977, and clean water legislation in 1972 and 1977. President Reagan saw environmental conservation as "fundamentally at odds with economic growth and prosperity," and he sought to terminate or cripple many of the environmental policies advanced in the 1970s (Park 2000, 79). However, the increasing attention paid to climate change was hard to ignore. In 1987, the Global Climate Protection Act was enacted to initiate the development of a coordinated national policy on climate change. The Act also called for the development of a US strategy for further international cooperation to limit the impacts of climate change (Park 2000).

In this context, the idea for a Law of the Atmosphere was brought to Law of the Sea veteran Edward L. Miles (1998, 21) for consideration in October 1987 by the chair of an interagency committee on oceans. Miles advised against a major US initiative on the Law of

the Atmosphere. He described his experience as the "chosen hatchet man" for the idea, meaning he was responsible for deciding if the initiative should move forward or not, and he wrote that his reaction to the idea of a Law of the Atmosphere was "intensely negative" due to the decade of his life spent in the Law of the Sea negotiations (Miles 1998, 21). As an alternative, Miles (1998, 24) proposed that protection of atmospheric and other common-pool resources could be achieved by "pursuing 'soft' regulation in a decentralized fashion as a strategy for buying time in the face of uncertainty" and stated that the initial response of the Department of State to this idea was enthusiastic. The evolving US stance on international climate change policy is further discussed later in the chapter.

Summary

During Period 2 (1985-1988), the idea for a Law of the Atmosphere was born in Canada. Canada's role as leader for the Law of the Atmosphere began in the planning stages of the 1988 Toronto Conference. Prior to the Toronto Conference, Howard Ferguson introduced the idea for a Law of the Atmosphere in two smaller forums. The US was exposed to the idea early on, and while it did not express immediate opposition, it was quietly dismissed. Other nations either did not know of or did not react to the idea.

Period 3: 1988-1989, Toronto Conference to Ottawa Meeting

The Law of the Atmosphere enjoyed its strongest support from 1988 to 1989. The proposal for a Law of the Atmosphere was first rolled out on the world stage to a large and diverse audience at the Toronto Conference in 1988, it was discussed in various international meetings in the following year, and a draft text adopted into the statement of the Ottawa

Meeting. This is the furthest the Law of the Atmosphere would be developed, and the last time it would be seriously considered in an international forum.

1988 Toronto Conference

The Toronto Conference was in part held in response the call to action issued by the Brundtland Commission to "people of all countries and all walks of life" to reorient future development to sustainable paths in order to secure social and ecological stability (Commission on Environment and Development 1987). Speaking before the Brundtland Commission in 1986, Canada's Minister of the Environment, Tom McMillan, took up the call to action and volunteered his country to host an international conference to consider ways of improving world capacity for forecasting environmental change. He suggested climate change as one of the main topics, and with the encouragement of the Commission, Canada began preparations for what came to be called the World Conference on the Changing Atmosphere: Implications for Global Security, held in Toronto, June 27-30, 1988 (WMO 1988). The Toronto Conference included representatives from North America (204), Western Europe (46), Asia (24), Africa (16), South and Central America (16), Eastern Europe (6), Australia/New Zealand (5), and international organizations (24, representing 15 agencies), for a total of 341 delegates.

A key message of the conference organizers to participants, as stated in the forward to the conference proceedings, was:

> "We were intent on demonstrating our conviction that these major atmospheric pollution issues are not independent, but are inextricably linked, and that political action to deal with both causes and effects must be based on a more holistic approach to atmospheric change and the human and economic dimensions of such change." (WMO 1988, vii)

This was authored by Law of the Atmosphere architect and Conference Director, Howard Ferguson.

Calls for a Law of the Atmosphere were made in special addresses by Canadian Prime Minister Brian Mulroney and Environment Minister Tom McMillan. In Mulroney's opening address, he forecast that a Law of the Atmosphere could be ready for the 1992 Earth Summit. He called the 1985 Helsinki Protocol on acid rain and the 1987 Montreal Protocol on stratospheric ozone depletion "important planks" on which a Law of the Atmosphere could be built. He stated that "we need new international legal mechanisms to forge global cooperation to protect and restore our atmospheric life-support system" (WMO 1988, 6), and announced that Canada would host an international meeting of legal and policy experts the following year (1989) to follow-up on the plan for a Law of the Atmosphere, with particular focus on climate change.

In McMillan's closing address to the conference, he declared that "The Government of Canada is passionately committed to the concept of an International Law of the Air" (WMO 1988, 34). Like Mulroney, he envisioned that a Law of the Atmosphere could be ready for the 1992 Earth Summit, and that it would "tie together, and build on" previous international agreements on components of the atmosphere (WMO 1988, 34). He concluded by stressing that, although Canada was committed to the Law of the Atmosphere concept, his country would support any effective global instrument to achieve the common purpose of protecting the atmosphere, including a narrower convention on climate change.

Norwegian Prime Minister Gro Harlem Brundtland in her keynote address did not directly refer to a Law of the Atmosphere but did stress the links between climate change, acid rain, and stratospheric ozone depletion. She urged "an international action plan for

protecting the atmosphere and, in particular, for preventing climate change" (WMO 1988, 20). Her plan included developing strategies for energy reduction, further research on renewable energy, creation of a technology transfer program, an increase in general scientific research, and development of a global climate change convention.

The conference statement reiterated steps already taken to develop international law and practices to address atmospheric change—for example, the Trail Smelter arbitration of 1935 and 1938, Principle 21 of the 1972 Declaration of the UN Conference on the Environment, Part XII of the Law of the Sea Convention, the LRTAP Convention, and the Vienna Convention and its Montreal Protocol—and urged that the next step should be an "overall convention constituting a comprehensive international framework that can address the interrelated problems of the global atmosphere" (WMO 1988, 296). A call for action was issued to governments, the United Nations, other international bodies and NGOs to work urgently towards an "Action Plan for the Protection of the Atmosphere." The Action Plan was to include development of a "comprehensive global convention as a framework for protocols on the protection of the atmosphere. The convention should emphasize such key elements as the free international exchange of information and the support of research and monitoring, and should provide a framework for specific protocols for addressing particular issues, taking into account existing international law" (WMO 1988, 297). It was recommended in the conference statement that development of a convention be vigorously pursued at the Ottawa Meeting in 1989, the Noordwijk Ministerial Conference in 1989 (which produced the Noordwijk Ministerial Declaration on Atmospheric Pollution and Climatic Change), and a Second World Climate Conference (WCC-II) in 1990, in order to prepare it for consideration at the UNCED in 1992. Part of the Action Plan was to ensure that

the statement and proceedings of the Toronto Conference were made available to the conferences mentioned above, and to all nations of the world. The conference also called for establishment of a World Atmosphere Fund to support implementation of the Action Plan. The World Atmosphere Fund would be partially financed by a levy on fossil fuel consumption in industrialized countries (WMO 1988).

The Toronto Conference was lauded by its organizers as the first comprehensive meeting on the atmosphere between scientists and high-level policy makers. In later years, it would be tagged as the starting point of international political efforts to address climate change (Paterson 1996). The conference statement included the first call for a reduction in global greenhouse gas emissions, and urged a non-binding target of a twenty percent reduction from 1988 levels by 2005.

Less than a year after the Toronto Conference, two of the key individual supporters for a Law of the Atmosphere departed from Canadian politics. Howard Ferguson left Canada's AES to organize and direct the WCC-II in Geneva, and Tom McMillan was defeated in the 1988 general election. The new Minister of the Environment, Lucien Bouchard, made no reference to a Law of the Atmosphere.

IPCC: Preparations for a framework convention

The politicization of climate change brought the legitimacy of the AGGG as the lead advisory panel on climate change into question. With the likelihood of a future climate convention mounting, the US wanted an "intergovernmental mechanism" set up to conduct scientific assessments of climate change (Agrawala 1997, 5). The "free wheeling experts" comprising the AGGG were not viewed as an appropriate mechanism for building international consensus, especially on an issue that was beginning to promise "enormous

economic repercussions" (Bernstein 2001, 166). The US view was shared by other industrialized countries, and heavily influenced the passage of a resolution by the WMO Executive Council Meeting requesting that the WMO and UNEP jointly establish "an intergovernmental mechanism to carry out internationally coordinated scientific assessment of the magnitude, impact and potential timing of climate change" (Agrawala 1999, 165). In response, the two organizations created the Intergovernmental Panel on Climate Change (IPCC) in 1988 to fulfill "the need of broad and balanced information about climate change" (IPCC 2009). Initially, the role as top advisor to governments on climate change shifted back and forth between the IPCC and the AGGG; however, by 1990 the work of the AGGG had been so marginalized that the group disbanded (Agrawala 1997).

A resolution by the UN General Assembly titled "Protection of global climate for present and future generations of mankind" outlined the first task of the newly created panel. It was to provide a comprehensive review of climate change; namely, the state of scientific knowledge on climate change, social and economic impacts of climate change, possible response strategies, identification of relevant legal instruments with a bearing on climate, and elements for inclusion in a possible future international convention on climate (UN General Assembly December 6, 1988). The target date for completion of the IPCC's initial assessment was set for two months prior to the WCC-II in Geneva. In order to fulfill its mandate, the IPCC established three main working groups: Working Group I assessed available scientific knowledge on climate change; Working Group II assessed the environmental and socio-economic impacts of climate change; and Working Group III drafted the list of elements for a framework convention on climate change. By October 1989, Working Group III had produced an initial draft of possible elements for inclusion in a

climate convention, and was expressing "full support for a framework convention" on climate change modelled after the Vienna Convention for Protection of the Ozone Layer (Zaelke and Cameron 1990, 273).

The work of the IPCC and its support for a framework convention on climate change received high profile endorsements. A 1989 Declaration of the Hague on the Environment urged all states and international organizations to take into account studies by the IPCC, in order to develop "the framework conventions and other legal instruments necessary to establish institutional authority" and to "protect the atmosphere and to counter climate change, particularly global warming" (The Hague March 11, 1989). Similarly, the 1989 Noordwijk Ministerial Declaration on climate change endorsed the work of the IPCC and recognized a number of key principles of relevance to a climate treaty (Noordwijk Ministerial Conference 1990). The declaration of the 1990 Houston G7 Summit also expressed strong support for the work of the IPCC and for negotiation of a framework convention on climate change (Houston Economic Summit July 11, 1990).

In general, these endorsements did not include statements supporting creation of a Law of the Atmosphere, or even agreements to encompass all interrelated problems of the atmosphere. The exception was the Declaration of the Hague on Environment, which spoke to general protection of the atmosphere, while at the same time emphasizing the importance of immediate action on climate change. The Noordwijk Ministerial Declaration also hints at a more comprehensive response in its recommendation that preparations for a climate convention should consider relevant aspects of the Vienna Convention for Protection of the Ozone Layer, and "innovative approaches as may be required by the complex character of the problem" (Noordwijk Ministerial Conference 1990, 601). While a Law of the

Atmosphere was not mentioned explicitly in any of the above statements, it was still a topic of discussion at other international meetings during the same time period.

International debate over a Law of the Atmosphere

In September 1988, the Woods Hole Research Center hosted an international workshop to consider effective political and economic steps for responding to climate change. The workshop was attended by 50 specialists in science and international policy and law. Participants discussed the potential of both national and international actions for mitigating climate change. The idea of a Law of the Atmosphere was debated, and it was concluded that, while desirable in the long run, it was overly ambitious, unlikely to succeed in the short term, and might hinder the development of a climate change convention. Instead, energies should be directed toward the creation of a climate convention (Ramakrishna and Woodwell 1989). Workshop participants did, however, support the call at the Toronto Conference for the establishment of a World Atmosphere Fund to help less-developed states reduce emissions and to support atmospheric research.

The First US-Canada Symposium on Impacts of Climate Change on the Great Lakes Basin was also held in September 1988. It was attended by 120 people with public and private interests in the Great Lakes Basin and climate change. Participants aimed to define (i) the dimensions of the potential impacts of future climate change on the Great Lakes, and (ii) the joint research needs for the two nations (US National Climate Program and Canadian Climate Centre 1989, 2). In his address to the symposium, Howard Ferguson once again suggested a Law of the Atmosphere. He emphasized that early action toward a Law of the Atmosphere was necessary, as one to two decades was the usual gap between scientific concern and international policy action, and suggested an extension of "our concerns, our

involvement, and our responsive actions to those broader global issues which will increasingly impact on the Great Lakes region ... We need to think globally and act both locally and globally" (US National Climate Program and Canadian Climate Centre 1989, 17).

A Law of the Atmosphere was also discussed in December 1988 at the Second North American Conference on Preparing for Climate Change held in Washington, DC. Sir Crispin Tickell, Ambassador of the United Kingdom to the United Nations, remarked on the Law of the Atmosphere in his address to the conference. Counselling caution to those looking toward a Law of the Atmosphere, he noted that the Law of the Sea was not a total success, and that many governments, including those of the US and Britain, still could not accept all its elements. He argued that for now, "We should adopt a step by step approach ... until the need for international management or even regulation becomes manifest" (Tickell 1988, 4). Kilaparti Ramakrishna also advised against pursuing a Law of the Atmosphere in his address. He had helped compile the results of the Woods Hole workshop, which he presented in a paper "International legal and policy options for dealing with global warming and climatic change" (Ramakrishna 1988). He reiterated the conclusion reached at the workshop that at present a framework convention would be a more effective response to climate change than a Law of the Atmosphere.

The negative reactions to a Law of the Atmosphere presented at the Woods Hole workshop and the Second North American Conference on Preparing for Climate Change, along with increasing calls for a single issue convention on climate change, helped set the tone at the last international meeting to discuss a Law of the Atmosphere, the 1989 Ottawa Meeting of Legal and Policy Experts.

1989 Ottawa Meeting of Legal and Policy Experts

The Law of the Atmosphere did not leave the international stage quietly; it was the main topic of the international meeting promised by Canada only eight months prior at the 1988 Toronto Conference. The Meeting of Legal and Policy Experts in Ottawa was sponsored by the Canadian Department of External Affairs (now referred to as Foreign Affairs and International Trade Canada) and Environment Canada. I requested a copy of the participants and proceedings of the Meeting of Experts from both departments under the Freedom of Information Act. Environment Canada replied that it had destroyed all records from the meeting, save the meeting statement. The Department of Foreign Affairs also failed to supply meeting proceedings, but did send the meeting statement and a list of the 18 Canadian participants with the names of foreign participants blacked out but not the country of residence. Representatives from five international organizations and 32 countries, representing North and South America, Europe, Asia, Africa, Oceania, and the Middle East attended the meeting. In total, there were 80 governmental, non-governmental, and academic legal and policy experts acting in their personal capacity. The three main goals of the meeting were: (i) to develop the legal and institutional framework for dealing with existing and emerging atmospheric problems by identifying potential elements for inclusion in a Law of the Atmosphere and a framework convention on climate change; (ii) to identify and work to overcome legal, technical, and scientific obstacles to consensus; and (iii) to develop a series of recommendations for future action (Department of External Affairs 1989).

The statement of the Ottawa Meeting only addressed the first of these three goals. The first half of the statement was a draft convention for a Law of the Atmosphere (Appendix 2). The 24 articles included definitions of 'atmosphere' and 'atmospheric

interference', procedures to strengthen the convention through protocols, and promotion of atmospheric research and technology transfer (Department of External Affairs 1989). The second half of the statement listed elements to be considered in the development of a convention on climate change. Suggested elements included subjects of possible protocols, establishment of a Conference of Parties and Secretariat for the convention, and the creation of a World Climate Trust Fund (Department of External Affairs 1989).

The Ottawa Meeting recognized that action to limit carbon dioxide and other greenhouse gases was urgently needed, and offered two legal alternatives. The first was to proceed with negotiations for a Law of the Atmosphere while simultaneously proceeding with negotiations for priority protocols under the convention, and the second was to develop a climate change convention and a Law of the Atmosphere at the same time.

I was unable to obtain the proceedings of the Ottawa Meeting but did interview three meeting participants. One interviewee, who had extensive experience in international negotiations, said that it could be sensed very quickly that a Law of the Atmosphere would go nowhere, and that it had already been overtaken by negotiations for climate change. Another stated that while the suggestion for a Law of the Atmosphere was not unwelcome to most participants, no one was particularly enthused about the idea. The same participant noted that the only people present at the Ottawa Meeting who were actively opposed to a Law of the Atmosphere were Mostafa Tolba, the Executive Director of UNEP, and the American representatives who reflected the non-interest of their government at the time in environmental issues.

Tolba's (1989) address at the opening of the Ottawa Meeting, titled "A step-by-step approach to protection of the atmosphere," expressed his strong opposition to a Law of the

Atmosphere. He stated UNEP's support for the major recommendations of the Toronto Conference, but asserted, "[UNEP is] convinced that a 'Law of the Atmosphere' or a 'Law of the Air,' an all-inclusive global instrument for the protection of the atmosphere, is not our aim" (Tolba 1989, 304). He warned that pursuit of a Law of the Atmosphere might inhibit movement toward a meaningful response to climate change. He recalled the "frustrations and difficulties in the elaboration of the Law of the Sea" and said that he did not want to see UNEP take on a "Mission: Impossible" (Tolba 1989, 307), and argued that the state of atmospheric science at the time could not support a comprehensive policy response. Tolba (1989) concluded by saying that the present was not the time for a Law of the Atmosphere. At the time of his address, he was highly influential due to his recent success in negotiating the Montreal Protocol (Bodansky 1994).

The disapproval expressed by the head of UNEP and the American delegation, and the general lack of enthusiasm for the idea of a Law of the Atmosphere, may have been decisive in the next step for the Law of the Atmosphere, which was no step at all. Following the Ottawa Meeting, to my knowledge, no further mention of a Law of the Atmosphere was made on the international stage in the years leading up to the 1992 UNCED (Smith 2001).

Summary

The Law of the Atmosphere enjoyed its highest level of exposure during Period 3 (1988-1989). It was first introduced to the world at the 1988 Toronto Conference, and a drafted was crafted at the 1989 Ottawa Meeting. The idea was debated at various international meetings, but the feedback was generally not positive. The most notable opposition to the Law of the Atmosphere came from Mostafa Tolba. The Ottawa Meeting was well-attended, but it took place at a time when the Law of the Atmosphere was losing

ground. At the same time, the newly-created IPCC and its heavily endorsed work toward developing a single-issue climate convention was gaining momentum.

Period 4: 1989-1992, Post-Ottawa Meeting to the UNCED

The final section of this timeline spans the period following the Ottawa Meeting in 1989 to the 1992 UNCED. The political and institutional components that could have made up a Law of the Atmosphere were still being developed and strengthened relative to the acid rain, stratospheric ozone, and climate change issues, but the idea to bring all under one umbrella convention faded from view. In this section, a Law of the Atmosphere is rarely mentioned; instead, the focus shifts to negotiations for a climate convention.

The state of atmospheric politics

Protocol negotiations and amendments for the Vienna and LRTAP conventions continued in the years leading up to the UNCED. In 1990, the Montreal Protocol was amended in London to add methyl chloroform, carbon tetrachloride, and other CFCs to the phase-out schedules for ozone-depleting substances, and a mechanism for providing financial and technical assistance to developing country parties was established. Adjustments were also made in 1990 and 1992 to accelerate the phase-out schedules for ozone-depleting substances. In 1988, the LRTAP Convention was extended by a protocol on nitrogen oxides, requiring a freeze on emissions of nitrogen oxides or their transboundary fluxes, and in 1991 a protocol on volatile organic compounds was signed that specified three different options for emissions reduction, one of which had to be selected by a party upon signature or ratification.

The much-anticipated WMO- and UNEP-sponsored WCC-II was held in Geneva from October 29 to November 7, 1990 (Jäeger and Ferguson 1991). Its main purpose was to

review the World Climate Program and to recommend policy actions. A key contribution was the timely completion of the IPCC's First Assessment Report. A series of non-governmental scientific sessions made up the first part of the conference, and attracted 747 scientists and technology experts from around the world. The scientific statement issued by the conference emphasized the risk of climate change, and the need for strong actions regardless of remaining scientific uncertainties (Jäeger and Ferguson 1991). The second part of the conference featured negotiations and discussions among heads of government and ministers from 137 states and the European Community. The Ministerial Declaration of the WCC-II called for a framework treaty on climate change to be ready for adoption at the 1992 UNCED. It also expressed support for a number of principles that would later be included in the UNFCCC, such as labelling climate change a "common concern of humankind," the principle of equity, recognition of "common but differentiated responsibilities" of countries at different stages of development, the concept of sustainable development, and the precautionary principle (Jäeger and Ferguson 1991, 535-539). The conference statement did not set targets for carbon dioxide emissions reduction. The lack of such a commitment disappointed many in light of the high expectations and level of attention directed at the WCC-II; however, the conference was an important step toward creation of the UNFCCC.

The Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC) was established in the month following the WCC-II under the auspices of the UN General Assembly and supported by UNEP and the WMO. Its mandate was to prepare "an effective framework convention on climate change, containing appropriate commitments, and any related instruments as might be agreed upon" to be ready

for signature at the 1992 UNCED (UN General Assembly December 21, 1990). The INC would go on to meet for six sessions prior to completing negotiations for the UNFCCC.

America's position on climate change and international environmental regulation

The first session of the INC was hosted by the US in February 1991. The US had called for a framework treaty on climate change, but rejected any form of targets and timetables based on projected economic impacts. In contrast, environment ministers from other members of the Organization for Economic Cooperation and Development (OECD) were advocating recognition of the precautionary principle, and a number of European states were calling for targets and timetables (Park 2000).

The Republicans held power under presidents Ronald Reagan and George Bush, Sr. (who succeeded Reagan in 1989) in the US from 1981 to 1993. While the stance of the Bush administration could be classified as less ideologically opposed to negotiations for a climate convention than the Reagan administration, it was nevertheless similar (Park 2000). The response of the Bush administration to climate change politics was shaped by three main principles (Hecht and Tirpak 1995, 373):

I. Actions taken by governments should be based on a 'no regrets' policy, involving policies and programs useful in their own right. This was a reflection of the uncertainty of climate change science.
II. Actions should reflect a 'comprehensive approach', including all greenhouse gases and all sources and sinks. This reflected their support for market approaches to protect the environment.
III. Actions should be voluntary with non-binding targets and timetables. This echoed the Republican ideal of non-government interference in regulating the environment.

American refusal to agree on binding emissions targets was based on their unease at projected economic impacts and the skepticism of much of the scientific work on climate change (Rowlands 1995; Hecht and Tirpak 1995). A study released by the Council of

Economic Advisors in 1990 projected the cost of reducing America's carbon dioxide emissions by twenty percent by 2100 to be between 800 billion and 3.6 trillion US dollars (Rowlands 1995). It was often cited by US officials to justify their national and international stance on climate change regulation. President Bush left the management of international climate change policy in the hands of the Domestic Policy Committee. One of the committee's most influential members, the Chief of Staff of the White House, John Sununu, was skeptical of results generated by the general circulation models (GCMs) used by the US team on the IPCC assessments because of the 500 kilometres grid scale used by these first-generation models. On this basis, he deemed that GCMs were not credible and could not be used in policy formulation (Miles 2002). It has also been argued that Sununu and other members of the Domestic Policy Committee were motivated first and foremost by limiting economic consequences to domestic industries, such as manufacturing and energy, in their stand against targets for reduction of greenhouse gas emissions (Park 2000). Despite international criticism, the US maintained its position against binding emissions targets throughout the sessions of the INC. In fact, the Bush administration threatened to boycott the UNCED if a climate convention containing specific targets was forwarded at the conference (Rowlands 1995). In the end, American preferences prevailed, and the UNFCCC required no specific commitments of its signatories.

Changes and challenges in Canadian climate change politics

Canada's role as leader for a Law of the Atmosphere and climate change diminished following the 1989 Ottawa Meeting (Smith 2001). Between 1989 and the first INC session in early 1991, domestic climate change politics in Canada were marked by increasing

marginalization of Canadian scientists in the policy process and activism against international regulation by the provinces and the oil and gas industry.

Canada's stint as an international leader for climate change and advocate of a Law of the Atmosphere had been supported by the considerable technical expertise it held in atmospheric science, especially within the AES (Smith 2001). At the time, most atmospheric scientists employed by the federal government worked in AES, and AES held a prominent position at the intersection between atmospheric science and policy (Parson et al. 2001). The implications of scientific knowledge on the atmosphere on the policy making process were being examined by bodies such as the AES Advisory Committee on Stratospheric Pollution and the Canadian Climate Program Board. These senior advisory committees, made up of scientists and officials, reviewed and prioritized research efforts, and drew implications for policy (Parson et al. 2001). However, as the issue of climate change became increasingly political and driven by economics, scientists in Environment Canada were marginalized in the policy process (Bernstein 2003). The senior atmospheric scientists comprising the Canadian team at INC sessions were replaced after 1991 when the international affairs section of Environment Canada responsible for climate change negotiations began to fill delegations ranks with economists and international relations specialists (Bernstein 2003).

The landscape of climate change politics in Canada was also being influenced by the domestic forces that had mobilized against international climate change regulation following the call made at the Toronto Conference for a reduction in carbon dioxide emissions by 2005. The Canadian economy is energy intensive, and relies heavily on exports, which produces both internal and external constraints in emissions-reduction policies (Bernstein 2003). Internal constraints involved relative costs and benefits of abatement measures, and external

constraints involved concerns over trade and competiveness, especially in relation to the US, Canada's largest trading partner. The oil and gas industry, which the federal government consulted during negotiations, aimed to sway Canadian support away from international regulation of greenhouse gas emissions (Macdonald and Smith 1999/2000). Canadian provinces were another significant domestic political actor mobilized by the call made at the Toronto Conference and were consulted during negotiations. The complexities of Canadian federalism and interdepartmental competition severely complicated the issue of climate change regulation (Smith 2001). Conflict of interests emerged between Environment Canada, the traditional leader on climate change, and Natural Resources Canada, the leader on domestic implementations (Bernstein 2003). Environment Canada advocated global action, while Natural Resources Canada focused on economic implications for energy and resource industries. In addition, there was conflict over the division of federal and provincial powers in climate change regulation. Many elements implicated in climate change fell under provincial jurisdiction or under joint federal/provincial mandates (Bernstein 2003). The provinces increasingly sought inclusion on Canadian negotiating teams, but the federal government usually refused (Parson et al. 2001). Canadian provinces were reluctant to support any emissions reduction strategies they perceived would come at a high economic cost.

The changes and challenges in Canadian climate change policy between 1989 and 1992 help explain the transformation of Canada from a leader for a Law of the Atmosphere to a "laggard" in climate policy both internationally and domestically after 1992 (Bernstein 2003, 85). During the INC sessions, Canada sought to narrow the divisions between the US

and European Community, and opted to travel the middle road in supporting a comprehensive stabilization commitment (Smith 2001).

UNFCCC opens for signature at UNCED

At the UNCED, Canadian Prime Minister Brian Mulroney signed the UNFCCC and his government became one of the first to ratify the treaty. Although Mulroney had made the first call for a Law of the Atmosphere on the world stage and expressed his desire to see a Law of the Atmosphere completed for the UNCED, he made no mention of the idea at the conference. The step-by-step approach had prevailed: the UNFCCC, one of the crowning achievements of the UNCED, was signed by 154 states at Rio de Janeiro. Its ultimate objective was to achieve "stabilization of greenhouse gas concentrations in the atmosphere at a level at would prevent dangerous anthropogenic interference with the climate system" (United Nations 1992, 4).

Even though the UNFCCC did not contain binding targets, some European and OECD states chose to unilaterally declare specific and sometimes aggressive targets and timetables. Canada opted for a more moderate goal to stabilize carbon dioxide and greenhouse gases at 1990 levels by 2000. American President George Bush, Sr. signed the treaty and committed the US to early ratification. He also pledged to develop a national climate change action plan by January 1993 (Hecht and Tirpak 1995). The US ratified the UNFCCC on October 15, 1992.

Summary

The Law of the Atmosphere faded from the international stage during Period 4 (1989-1992). Canada's ability to lead was compromised by domestic constraints and the

marginalization of its atmospheric scientists in policy. Regulation for acid rain and stratospheric ozone depletion continued to develop, as did plans for a framework convention on climate change. The UNFCCC eventually forwarded for signature at the UNCED reflected American preferences and marked the closing of the window of opportunity for a Law of the Atmosphere.

Conclusion

In this chapter, a timeline of events, key to understanding the birth and death of the idea for a Law of the Atmosphere, was presented. The timeline began by tracing the rising international regulation and politicization of atmospheric issues in the late 1970s and 1980s. In 1986, the idea to bring all the interrelated problems of the atmosphere under one comprehensive treaty was conceived, and in 1988, the idea of a Law of the Atmosphere was presented to the world. The goal was to have a Law of the Atmosphere treaty prepared for the 1992 UNCED. Between 1988 and 1989, a Law of the Atmosphere was drafted and debated at various international meetings, but after 1989 it was eclipsed by work on the climate change convention. The 1992 deadline for a Law of the Atmosphere came, and went. In the next chapter, key factors that explain the failure of the Law of the Atmosphere to become reality are identified, organized, and analysed. The key actors related to these key factors are displayed in Table 3. Only actors that help explain the nonregime outcome are listed in the table.

Table 3: Key actors in the Law of the Atmosphere nonregime

Individual actors	**State actors**	**Organizational actors**
Howard Ferguson	Canada	UNEP
Brian Mulroney	United States	UN General Assembly
Tom McMillan		AES (Environment Canada)
Mostafa Tolba		IPCC

Chapter 4: Analysis of the Law of the Atmosphere nonregime, 1988-1992

Introduction

In this chapter, I answer my research question: *What factors explain why a Law of the Atmosphere failed to become a regime during its 1988 to 1992 window of opportunity?* I return to the table of regime formation summary factors from Chapter 2 (Table 2), and, using the timeline presented in Chapter 3 as backdrop, seek to explain the Law of the Atmosphere nonregime. I identified what summary factors were important and their relative importance. I conducted a subjectively quantitative analysis to determine relative influence using document analysis and interviews with participants who were active in the policy and/or science process during the 1988-1992 time period.

I started with the assumption that all summary factors had no influence. If a summary factor was identified as influential in a document or interview, its influence on the Law of the Atmosphere nonregime was assumed to increase each time it was mentioned. I divided the relative influence of summary factors into three categories: high influence, moderate influence, and low or no influence (Table 4). This chapter is divided into three sections based on this categorization scheme. In the first section (high influence), the three most important summary factors that contributed to the Law of the Atmosphere nonregime are discussed in order of influence. I chose to identify only three as high influence because they were mentioned in documents and interviews far more often than moderate influence factors. In the second section (moderate influence), four summary factors that had modest influence are discussed. Moderate influence summary factors were mentioned, but substantially less often than the three high influence summary factors. In the third section (low influence), the two summary factors that had little or no influence are discussed. Low influence summary factors

were not mentioned at all. For each summary factor, only the (sub-) factors that I found to be relevant to the Law of the Atmosphere nonregime are listed and addressed.

Table 4. Rating of factor influence on the Law of the Atmosphere nonregime

Factor	High influence	Moderate influence	Low influence
Available solutions	X		
Leadership	X		
Issue characteristics	X		
Policy area		X	
Resource-user characteristics		X	
Knowledge		X	
Context		X	
Interest and payoff			X
Power			X

High influence factors

Available solutions

In the 1980s the international community was confronted with four known international atmospheric problems, two of which were regional in scale (acid rain and Arctic haze[2]) and two of which were global in scale (stratospheric ozone depletion and climate change). This triggered a debate on how best to deal with this collection of problems from a political rather than scientific perspective—with a Law of the Atmosphere, or something else? "Something else" was chosen.

The most important summary factor explaining the failure of the Law of the Atmosphere to form between 1988 and 1992 was available solutions relative to this collection of atmospheric problems, which refers to solutions, specifically institutional

[2] Arctic haze was not discussed in Chapter 3 because it did not contribute to the Law of the Atmosphere debate. However, it was a regional-scale air pollution problem subject to intense research efforts in the 1980s (Soroos 1992, 1993).

options, available to combat a problem. One sub-factor related to available solutions influenced the Law of the Atmosphere nonregime.

> **Salient solutions:** The existence and appeal of simple or familiar solutions helps regime negotiations to succeed. Salient solutions offer uncomplicated formulas that are intuitively appealing or borrow familiar formulas from prior cases. They can also be easily explained to policymakers and the general public.

Salient solutions in the case of the Law of the Atmosphere refered to institutional structures that could facilitate solving international problems related to the atmosphere, not solving the problems themselves. Two options emerged by the late 1980s: non-integrated, single-issue conventions to tackle individual problems, and an integrated, umbrella convention to protect the atmosphere as a whole. Both options were familiar solutions in that the international community had experience with both types.

Comprehensive approach

The Law of the Sea was the only comprehensive convention that could provide a model for governing the atmosphere as a whole. The 1988-1992 window of opportunity for a Law of the Atmosphere falls in the decade long gap between the end of the Law of the Sea negotiations in 1982 and its entry into force in 1994. The legacy of difficulties encountered in the marathon Law of the Sea negotiations cast a long shadow over the idea for a Law of the Atmosphere and significantly contributed to its failure to become a regime.

Two interviewees expressly commented on the negative influence. One stated that the "main obstacle [to a Law of the Atmosphere] was the experience to the time with the Law of the Sea, i.e. that major players had not become parties to or ratified the Law of the Sea, so even a long time after it had been negotiated, it was not legally binding." Another pointed out that the Law of the Sea was just "sitting there, it wasn't going anywhere [when the Law of

the Atmosphere was introduced]. Even a country like Canada, which had been such a promoter of the Law of the Sea ... it took Canada decades to ratify it." A third did not refer to the Law of the Sea specifically but to the experience with an umbrella convention generally: "the idea of an umbrella agreement was considered too complicated for people who wanted to focus particularly on the climate warming problem."

In an address to the Second North American Conference on Preparing for Climate Change, British UN ambassador Sir Crispin Tickell (1988) used an analogy with the Law of the Sea to argue against a Law of the Atmosphere. Similarly, Edward Miles (1998) referred to the decade of his life spent in Law of the Sea negotiations to urge the US not to pursue a Law of the Atmosphere. The head of UNEP, Mostafa Tolba (1989, 307), also cited "the frustrations and difficulties in the elaboration of the Law of the Sea." The timing and problems of the Law of the Sea and its negotiating process were viewed as warning against a Law of the Atmosphere.

Single-issue approach

All interviewees commented on advantages of the single-issue approach. One explained that a "specific, narrower convention could be negotiated and implemented" faster than a comprehensive convention. A second said that negotiations for single-issue conventions were faster since the topic would be narrow and focused, and that "things could actually get through and done." A third claimed, "What we've done internationally and nationally is to focus on the individual problems rather than looking at the overall situation. I guess the isolated solutions are preferred by that level of policy making and politics rather than the integrated solutions that would be represented by a Law of the Atmosphere." A fourth said that a climate convention was chosen over a Law of the Atmosphere because "we

needed something more specific. If you look at the Law of the Sea convention you'll realize it deals with a whole range of issues ... and the movement from Law of the Sea to climate change was just a more functional focus." And the fifth explained that the dominance of the climate convention can be explained by the fact that "you can handle [atmospheric problems] on piecemeal, issue-by-issue basis. That's what we've done, so that's the evidence [supporting this approach]."

The model for a single-issue, atmospheric-related global convention came from the highly successful 1985 Vienna Convention and its 1987 Montreal Protocol. The shadow cast over the Law of the Atmosphere process by the Law of the Sea experience appeared even darker when compared to the speed and success of the Montreal Protocol (Sebenius 1991, 117). Negotiations for the Montreal Protocol were concluded relatively quickly, and it was implemented ahead of schedule (Zaelke and Cameron 1990). The Montreal Protocol was supported by key developed states and hailed as international cooperation at its finest. The Montreal Protocol seemed to illustrate and validate the effectiveness of a step-by-step approach to protection of the atmosphere.

The Montreal Protocol was also the pet project of Mostafa Tolba, Executive Director of UNEP. Tolba drew on the success of the Montreal Protocol to strengthen his argument against the proposed Law of the Atmosphere. Despite the express purpose of the 1989 Ottawa Meeting to elaborate on the plan for a Law of the Atmosphere, Tolba, in his address to participants, actively sought to dissuade them from creating a Law of the Atmosphere: "If we had reached too far at Montreal, we would almost certainly have come away empty-handed. Instead, UNEP shaped a protocol ... which is proving to be quite a radical instrument" (Tolba 1989, 305). He went on to argue that in light of the experience with the

Montreal Protocol, specific and separate agreements and action plans would be a more prudent choice than a comprehensive convention.

The single-issue approach to protecting the atmosphere was further supported in various international forums. At the international Woods Hole workshop, participants decided that pursuit of a climate convention was the most prudent choice, and that a Law of the Atmosphere would prove too ambitious a goal and could inhibit real action on climate change. The single-issue approach was also the solution of choice for the IPCC. At a meeting in October 1989, the IPCC's Working Group III (policy responses panel) was expressing full support for a climate convention based on the framework-protocol approach taken for protection of the stratospheric ozone layer. In the same month, it presented a draft list of elements for inclusion in the future framework convention at a plenary meeting of the IPCC (Zaelke and Cameron 1990).

Indirect support for the single-issue approach also came in the form of endorsements of the work of the IPCC. The IPCC's efforts toward a climate convention were approved in a resolution by the UN General Assembly in December 1989, and endorsed in the 1989 Declaration of the Hague, the 1989 Noordwijk Ministerial Declaration, and by the G7. IPCC's push for a climate convention and its high-profile endorsements helped doom the idea for a Law of the Atmosphere. The pursuit of a climate convention had gained too much momentum to be slowed down by an unwieldy umbrella agreement.

Summary: Salient Solutions

Two salient solutions were available to address the problem of atmospheric change: comprehensive and single issue. Each was evaluated in part based on experiences to date. The comprehensive approach was heavily defined by the recent experience with the Law of

the Sea and the complexity of governing the entire global oceanic commons under a single umbrella convention. Opponents of the Law of the Atmosphere argued that governing the global atmospheric commons using the same approach would have the same undesirable results. The timing of the 1988 proposal for a Law of the Atmosphere—it fell between the 1982 conclusion of the final Law of the Sea conference and its 1994 entry into force—also contributed to the failure of the Law of the Atmosphere. The second salient solution available was the single-issue approach. There were prominent supporters of a climate convention, most notably the IPCC. Preference for the single-issue approach was reinforced by the recent success of the Montreal Protocol, which was lauded as one of the most successful instances of international environmental governance. Both the Law of the Sea and the Montreal Protocol were used to argue against creating a Law of the Atmosphere. These agreements were significant in a world experiencing its second—or internationalization—wave of environmentalism, and timely relative to the introduction of the Law of the Atmosphere. All interviewees and most documents forwarded arguments related to the available solutions summary factor; hence, I rated this summary factor as the most significant in explaining the Law of the Atmosphere nonregime.

While the two salient solutions, comprehensive and single-issue, may appear mutually exclusive in this analysis, they were not. According to the Canadian architects of a Law of the Atmosphere, a climate convention could have been developed alongside a Law of the Atmosphere, and the climate convention could have been later brought under the umbrella convention. Toronto Conference Director, Howard Ferguson, explained that this distinction—that the two solutions could complement rather than compete with one another—was not made clear at the 1988 Toronto Conference. The failure to clarify and

define the Law of the Atmosphere during the idea's initial introduction on the world stage may have led to later widespread interpretations that the two solutions were in competition (Sebenius 1991; Zaelke and Cameron 1990) and that climate change would continue unchecked through long-winded negotiations for a Law of the Atmosphere. Although the two solutions were not designed to be mutually exclusive, they were generally treated as such. The remaining eight summary factors fed into the 'competition' between the climate convention and the Law of the Atmosphere.

Leadership

The second most important summary factor that inhibited the Law of the Atmosphere from forming was leadership. The leadership summary factor refers to the presence of a strong and consistent leader who champions an issue for regime formation. Leadership can be exercised by an individual or a state. Two factors were incorporated into this summary factor and both influenced the Law of the Atmosphere nonregime.

> **Individuals as leaders:** The presence of strong and consistent individual leadership leads to regime formation. Individuals who exercise leadership aim to overcome collective-action problems by promoting regime formation to involved parties. There are different forms of individual leadership that can be exercised (even simultaneously) in regime negotiations, but only the emergence of some form of individual leadership is necessary to increase the likelihood of regime formation.
>
> **Strong leadership:** Strong leaders help establish and encourage collective action to govern a commons. Leaders, or mobilizers, issue empowerment messages that emphasize the value of collective action and the importance of individual efforts coordinated with others. Empowerment messages raise expectations of the contribution that others will make, and can help jump start collective action to govern and protect a commons.

The three individual leaders who were most prominent in supporting a Law of the Atmosphere were Canadians who were active in the policy arena. The most notable individual leader who opposed it (because he supported a climate convention) was Mostafa

Tolba. The only state leader for a Law of the Atmosphere was Canada. There were no states that were actively opposed to a Law of the Atmosphere. The US resisted the idea but was not actively lobbying against it.

An interviewee who attended the Ottawa Meeting said, "I didn't get the feeling that the suggestion [of a Law of the Atmosphere] was unwelcome on the part of most the participants, possibly excepting the Americans representatives there who weren't interested in doing anything about the environment ... The American policy people that attended that meeting were reflecting the view of the US government at that time. Reagan was president, and his Republican administration was not enthused at any action on the environment." The same interviewee expressed the belief that "the [Law of the Atmosphere] involving an international umbrella convention or treaty, really needed a prominent international sponsor such as Al Gore, Tolba, Obama – these are the sorts of people that would need to pick up the ball and run with it for it to fly internationally." Such sponsors appeared but their leadership was short lived. The Law of the Atmosphere was a Canadian idea, and it had a number of influential Canadians promoting it on the world stage. By tracing the fate of these Canadians and Canada itself as a leader, the nonregime outcome of the Law of the Atmosphere can be better understood.

Initial leaders for a Law of the Atmosphere

Howard Ferguson, head of Environment Canada's AES, was the first person to introduce the idea for Law of the Atmosphere. He did so at the First North American Conference on Preparing for Climate Change in 1987, and went on to promote the idea at various international conferences until the Ottawa Meeting in February 1989. Thereafter, he left Environment Canada in June 1989 to organize the WCC-II held in Geneva in late 1990.

He was the most active individual leader for a Law of the Atmosphere, but he did not continue to press for it after the Ottawa Meeting because he became totally preoccupied with the task of organizing the conference (interview with Howard Ferguson, October 27, 2009).

Tom McMillan, Canadian Minister of the Environment, was also a leader for a Law of the Atmosphere for a short period of time. He proclaimed at the 1988 Toronto Conference that "The Government of Canada is passionately committed to the concept of an International Law of the Air" (WMO 1988, 34). However, he was voted out of office in a general election only five months after his speech. The new Minister of the Environment, Lucien Bouchard, made no public reference to a Law of the Atmosphere.

Prime Minister Brian Mulroney, representing Canada as a whole, was another ephemeral leader for the Law of the Atmosphere. He pitched the idea at the 1988 Toronto Conference, and announced that Canada would host a follow-up meeting in 1989 to further develop it. Despite his apparent enthusiasm, Mulroney did not continue to promote a Law of the Atmosphere after the Ottawa Meeting. His failure to maintain Canada's role as leader for a Law of the Atmosphere was due to both domestic and external constraints.

On the domestic front, the recommendations of the Toronto Conference alerted the provinces, oil and gas industries, and other domestic actors that they would be negatively affected by regulation of greenhouse gas emissions and began mobilizing in opposition (Macdonald and Smith 1999/2000). Smith (2001) and Bernstein (2003) have argued that Canada's claim to leadership on climate change was tempered by domestic sources of foreign policy, in particular the provincial governments. MacDonald and Smith (1999/2000, 116) have observed that Canada's commitment to stabilize emissions at UNCED in 1992 instead of pursuing aggressive reductions in the manner of a number of European Community is

"testimony to the fact that domestic and international forces had coalesced to constrain overly enthusiastic initiatives." Domestic opposition in Canada weakened the country's ability to push for a comprehensive treaty.

Another domestic constraint on Canada's role as leader for a Law of the Atmosphere was the gradual sidelining of science. As the issue of climate change became more politicized, Canadian scientists were increasingly marginalized in shaping climate change policy. Canada's year-long stint as an international leader for a Law of the Atmosphere was made possible by the technical expertise housed in AES (Smith 2001). The idea for a Law of the Atmosphere had come from atmospheric scientists in AES, but during climate change negotiations, they were cut from the Canadian negotiating team.

The US comprised the strongest external constraint on Canada's leadership for a Law of the Atmosphere. An interviewee flagged the Canada-US relationship as a stumbling block, stating that "Mulroney was certainly trying to be the best of friends with Reagan, and the Reagan attitude toward any action on climate change (or other international agreements on environmental concerns) was very cool, which probably influenced Mulroney not to push the issue." Smith (2001) and Parson (2001) point out that Canada's economy is closely tied to the economy of the US, and Canadian policy development is constrained by US parameters. Smith also observes that the Mulroney government compromised its position on environmental issues in order to maintain a friendly relationship with the US.

Summary: Leadership

The lack of a strong and consistent leader for a Law of the Atmosphere contributed to its demise. The government of Canada and individuals within the government demonstrated leadership, but it was short-lived. No long-term leaders for a Law of the Atmosphere

emerged. A climate change convention, however, did have strong leaders. Mostafa Tolba was one. He announced UNEP's support for a climate convention over a Law of the Atmosphere at the Ottawa Meeting. One interviewee who attended the Ottawa Meeting stated that if a person as influential as Tolba "came in and said [the idea for a Law of the Atmosphere] is crap, you wouldn't need too many interventions like that for everyone to turn around and say 'Oh, absolute crap, I don't know what the hell I'm doing here, waste of time.'" With Tolba leading the movement for a climate convention and no one consistently leading for a Law of the Atmosphere, the competition between the two solutions can be better understood. The leadership summary factor strengthened the single-issue approach, and Tolba's active opposition to a Law of the Atmosphere likely weakened the comprehensive approach.

Issue characteristics

The third most important summary factor that explains the Law of the Atmosphere nonregime is issue characteristics. The issue characteristics summary factor refers to the nature of the issue in question, especially in regard to its ease and likelihood of governance. Two factors were incorporated into issue characteristics and both were relevant to the Law of the Atmosphere nonregime.

> **Resource characteristics:** Successful commons governance is easier when the resource is small, uniform, simple and predictable. A smaller size usually means fewer users and makes the resource easier to monitor. Other resource characteristics that aid in commons governance are a relatively small number of negative externalities from resource use and the ability to discern stable and well-delineated boundaries around the resource. If a resource is part of a complex system, it is more difficult for resource-users to agree on rules to address the numerous externalities. Clear boundaries make identification of resource-users and the extent of their use easier to determine. Resources that are time dependent are less likely to be governed than those that are not. That is, a renewable resource with a replacement rate that grossly exceeds the withdrawal rate, or a resource with a withdrawal rate that grossly exceeds the replacement rate to the current point of near-destruction is less likely to be governed.

Issue properties: In dissensual conflicts, actors disagree on what is desirable for them individually and collectively. A dissensual conflict about values is the most difficult to regulate because values cannot be negotiated, while a dissensual conflict about means to achieve an agreed upon end is more likely to lead to regime formation. In consensual conflicts, actors all desire the same object, but no one can be fully satisfied. A consensual conflict about relatively assessed goods is difficult to regulate because it often sparks intense competition, while a consensual conflict about absolutely assessed goods is more likely to lead to regime formation.

Resource characteristics

The atmosphere is an extremely complex system, and one of the few truly global commons. It has a number of characteristics that make it a challenge to govern. First, the atmosphere is not a small, simple, or predictable resource. It envelopes our planet and the complexity of the interactions between its components (including the human component) make scientific predictions and certainty difficult. Second, the atmosphere has no clear boundaries. Pollution can flow from one state to the next and around the world, and no state can make exclusive use of the atmosphere within its state boundaries. Third, the degradation of the atmosphere is an externality. The atmosphere is used as a sink for the pollution that accompanies transportation, industrial activity, and a myriad of other modern activities. Fourth, the atmosphere has low excludability and high rivalry. Excludability is low because no one can be excluded from using the atmosphere. Rivalry is high because one user's consumption of the atmosphere (i.e. as a sink) comes at the expense of another user's consumption. Fifth, the atmosphere is a relatively assessed good. The value of the atmosphere varies significantly depending on the resource-user. For instance, some prioritize economic development over environmental protection.

Complexity of the atmosphere and the nonregime

One interviewee noted, "you really have to screw up badly before the conclusion is that you need a Law of the Atmosphere." In other words, the atmosphere can be characterized as a complex and resilient system. The same interviewee claimed "climate change is a simpler idea since it deals with a specific issue [instead of all atmospheric problems at once]." Hence, the climate was seemingly being characterized as a less complex system.

Soroos (1998, 34) writes that, "One of the reasons why there has been so little progress toward a law of the atmosphere is that the atmosphere is an undifferentiated mass of gases that is constantly circulating over the surface of the planet." Najam (2000, 4047) argued the case for a Law of the Atmosphere but conceded that the issue-by-issue approach was based on certain substantive conveniences: "the atmosphere is an extremely complex system; and one that is still much less than well understood. Trying to tackle sub-systems ... and the myriad of scientific uncertainties associated with them is difficult enough in itself." In his speech to the Ottawa Meeting, Mostafa Tolba (1989) described how the various problems in the atmosphere are interdependent, noting that CFCs are also greenhouse gases, and that thinning ozone leads to acid rain, the greenhouse effect, and other pollution problems. However, Tolba also drew on the characteristics of the atmosphere to argue against a Law of the Atmosphere. He explained that the range of threats to the atmosphere "differs so much spatially, temporally, and qualitatively that it is difficult – at this stage, effectively impossible – to perceive their being encompassed in a single instrument." Tolba (1989, 305-306) also questioned "the efficacy of an umbrella convention for all atmospheric problems, which include issues as yet unquantified and ill-defined."

Summary: Issue characteristics

The difficulties of regulating the entire atmospheric system under one umbrella convention inhibited the plan for a Law of the Atmosphere. A number of characteristics of the atmosphere make it a difficult resource to govern. The argument that the atmosphere is an integrated whole and should be governed as such made sense on a scientific level but fell apart on the political level. Science could point to the connections and relations of atmospheric components, but policymakers could only see the "procedural nightmare" (Najam 2000, 4047) in negotiating and implementing a Law of the Atmosphere. As a result, the complexity of the atmospheric system worked against formation of a Law of the Atmosphere. Even though climate change was extremely complex in itself and ridden with uncertainties, it was deemed more tractable at this time than an comprehensive approach.

Moderate influence factors

Policy area

A fourth summary factor that inhibited the Law of the Atmosphere regime was the policy area. Policy areas are broad sets of issues and their governing institutions that can be distinguished and categorized by their value and subject (e.g. environment, economy, human rights). The policy area summary factor refers to the influence on regime formation of characteristics of the policy area in which an issue exists. Three factors are incorporated into policy area, and all are relevant to understanding the Law of the Atmosphere nonregime.

> **Integration:** Integration among states usually begins in limited functional and economic areas. Integration generally increases over time and is difficult to reverse. If relevant states are well integrated and process a high density and wide spectrum of transactions, then regime formation is more likely.

Normative-institutional: A regime is more likely to form when an issue belongs to a policy area already structured by international institutions. Existing international organizations influence regime formation by providing a forum for further development and setting a precedent for cooperation. Existing institutions also serve as models or focal points for creating a new regime.

Policy priority: There are two lines of research on the influence that an issue's priority on the policy agenda has on regime formation. The first and more prominent is that an issue's high priority on the policy agenda can contribute to success in regime formation. The second is that a regime is more likely to form when it is not high priority on the agenda of parties.

A Law of the Atmosphere falls into the international environmental policy area. Within this area, the issues and institutions with the most bearing on the Law of the Atmosphere nonregime were those related to either the atmosphere specifically or to global commons in general. From 1988 to 1992, the most relevant issues and their governing institutions were those related to stratospheric ozone depletion and acid rain, and to governing of the ocean commons. During the window of opportunity for a Law of the Atmosphere, work was still in progress to develop further protocols to the LRTAP Convention (acid rain) and amendments to the Montreal Protocol (ozone). As already noted, negotiations for the Law of the Sea had concluded in 1982, but the treaty did not enter into force until 1994. Hence, it is clear that the policy area in which debate over a Law of the Atmosphere occurred was already structured by international institutions involving a high density of transactions between states (normative-institutional and integration). This created conditions conducive to forming a Law of the Atmosphere; however, it was also conducive to forming a climate change regime.

When the policy priority factor is added to the equation, though, the scales were tipped in favour of climate change. From 1988 to 1992, addressing the immediate problem of climate change was a higher priority than addressing all the interrelated problems of the

atmosphere. An interviewee explained that the Law of the Atmosphere was "overtaken by a single issue, which was climate change, and you can't carry too many topics on the agenda at any one time ... You only have so much energy, you only have so many people, and the political agenda as it evolved became focused on climate change and people weren't going to share that limelight with something called Law of the Atmosphere."

The need for international policy on climate change helped opened the window for the idea of Law of the Atmosphere, and the Law of the Atmosphere fed off the momentum of the perceived need for international action on climate change, yet the climate change convention received far more endorsements and international attention. Climate change was a higher priority (Ramakrishna and Woodwell 1989; Ramakrishna 1988).

Resource-user characteristics

A fifth summary factor that inhibited the Law of the Atmosphere from becoming a regime was resource-user characteristics. The resource-user characteristics summary factor refers to characteristics of the users that draw on a common resource that affect the likelihood of regime formation. Three factors from resource-user characteristics had a bearing on the Law of the Atmosphere nonregime.

> **Number of players:** A small number of players are more likely to cooperate to form a regime because they are able to sustain full cooperation in a self-enforcing agreement. An agreement among a large number of players can only improve marginally on the outcome of non-cooperation. Large-scale cooperation is difficult to achieve and usually does not produce significant results. An agreement involving a large number of players is either narrow instead of wide or shallow instead of deep. Issue linkage makes large-scale cooperation more likely.
>
> **Resource-user characteristics:** Resource-users are most likely to create common-property institutions when the number of users is small enough to keep communication and decision-making costs low and when appropriators reside permanently near or in the resource. At the local level, a lower degree of homogeneity among resource-users makes users more likely to organize to govern a commons. At

the global level, heterogeneity in capabilities, preferences, and information and beliefs usually facilitates cooperation but occasionally may not, depending on the context. Resource-users that share a long term vision for the resource and its benefits are more able to successful govern a commons. A moderate to heavy level of resource use also encourages resource-user cooperation, as they attempt to prevent overuse.

History of user organization: Resource users with a history of interaction and prior experience with at least minimal levels of organization are more likely to cooperate to govern a commons. Prior experience can be through the presence of a general purpose organizational structure (i.e. a village council), or a specialized organizational structure related to the resource, but without prior management responsibilities (i.e. an airplane club). Experience with organization can also be fulfilled by the presence of nearby organizations that have helped others govern similar commons issues.

All individuals are resource-users of the atmosphere, and a state is a collection of individual users within a border. However, since states (not individuals) are involved in international regime formation, I treat each state as a single resource-user in this analysis. It is obvious that the number of players involved in regulating the atmosphere would be very high; this made formation of a Law of the Atmosphere less likely. An interviewee pointed out that unlike negotiations for an umbrella convention, with a single-issue convention "you could drive stuff through because it tended to be rather narrow and rather focused and implicated a limited number of countries or people or industrial sectors. That's attractive, because you can actually get stuff done."

All states draw on the atmosphere, but it is not a resource that is shared equally among users. During the window of opportunity for a Law of the Atmosphere, the main responsibility for greenhouse gas emissions lay with developed nations. The US alone was responsible for one-fourth of all anthropogenic greenhouse gas emissions (Energy Information Administration 2006). At the same time, greenhouse gas emissions of states moving toward development (especially India and China) were on the rise due to the high energy demands of vital development (Sebenius 1991). The economic disparity among

resource-users and the unequal use of the atmosphere as a sink for emissions by resource-users are key characteristics that make the atmosphere extremely difficult to govern.

There was a history of cooperation among states to combat global environmental issues—protecting the stratospheric ozone layer, banning nuclear testing in the atmosphere, establishing the Law of the Sea conventions, and safeguarding the Antarctic. These agreements all demonstrate a history of user-organization to protect global common-pool resources. However, in the case of the Law of the Sea, the history of user-organization was not necessarily deemed positive. On the other hand, the history of user-organization to protect *components* of the atmosphere was quite positive, especially with the success of the Montreal Protocol. Therefore, it may be that the history of user-organization made formation of a single-issue climate regime formation more likely and a Law of the Atmosphere less likely.

Knowledge

A sixth summary factor that contributed to the Law of the Atmosphere nonregime is knowledge. The knowledge summary factor refers to the state of scientific knowledge and the level of cooperation in the scientific community that influences regime formation. Four knowledge factors influenced the Law of the Atmosphere nonregime.

> **Epistemic communities:** An epistemic community is a network of professionals with recognized expertise in a particular domain that frames and articulates a problem and its solutions. Regime formation is encouraged when an epistemic community arises in an issue area. The epistemic community communicates with policymakers to convey their understanding of the issue and can often influence the form of regime options. An epistemic community offers consistent, authoritative and informed advice to reduce uncertainty in the issue area.
>
> **Scientific convergence:** A common and widely understood conception of the causes of a problem and suitable responses clears the way to regime formation. Scientific consensus on the cause-and-effect relationship of an environmental issue encourages

international cooperation. Some theorists argue that international cooperation occurs almost spontaneously with scientific convergence on an issue.

Knowledge and information: Successful commons governance is easier when the dynamics of the resource are well-understood, including the stocks, flows, and processes within the resource system and the human-environment interactions that affect the resource system. Information should be verifiable, and it must be congruent with decision-maker's needs and the scale of the particular decision or event. Information must include scientific uncertainties and individual and societal values related to the resource.

Model uncertainty: Model uncertainty occurs when players do not understand a problem in its full complexity and have incomplete information about their payoff relative to others. Model uncertainty can detract from regime formation because states can use it to disguise their true reasons for opposition to regulation (usually based on national interests). Model uncertainty provides a safe haven from which states can oppose regime formation on the grounds of 'not proven.'

The influence of knowledge on the Law of the Atmosphere was mixed. Scientific knowledge on the interrelated character of the atmosphere inspired the call for a Law of the Atmosphere. Najam (2000, 4048) argued that "substantively, science clearly calls for a comprehensive policy response." However, scientific knowledge functioned to both strengthen and weaken the argument for a Law of the Atmosphere. The 1988 Toronto Conference Background Paper on the Changing Atmosphere, prepared by Jill Jäeger, stated that there are "strong links between the major issues of the changing atmosphere" (WMO 1988, 393). She pointed out two links, the first between greenhouse gas emissions and stratospheric ozone depletion, and the second between greenhouse gas emissions and acid rain. Jäeger wrote, "The issues they pose are complex and involve large uncertainties ... these links suggest the need to consider the issues together when priorities are being set for policy" (WMO 1988, 394). The links between atmospheric issues were also briefly addressed by the three keynote speakers and in theme papers. However, these links were not fully emphasized in the conference because scientific knowledge on the synergies between the separate issues

was not well-developed. The conference, including the conference statement, tended to contain brief reference to links between atmospheric issues, then explore acid rain, stratospheric ozone depletion, and climate change individually. Scientific knowledge on component atmospheric issues was (more or less) ample, but knowledge of their links was not sufficient to buttress calls for a Law of the Atmosphere. Mostafa Tolba capitalized on this weakness to argue against a Law of the Atmosphere. In his address to the Ottawa Meeting, he said "the range of known and potential threats [to the atmosphere] differs so much spatially, temporally, and qualitatively that it is difficult – at this stage effectively impossible – to perceive their being encompassed in a single instrument" (Tolba 1989, 306). Thus, there was no "scientific convergence" relative to the interactions between atmospheric components. Related to this, model uncertainty, where players do not understand a problem in its full complexity, also worked against a Law of the Atmosphere.

Knowledge factors fed into the competition between a climate change convention and Law of the Atmosphere. Climate change had the IPCC a strong and formalized epistemic community on its side. The IPCC's Working Group III enjoyed numerous endorsements for its work toward a climate change convention. The science supporting both climate change and a Law of the Atmosphere was ridden with scientific uncertainties; however, the knowledge base for climate change was, relatively speaking, more solid. In contrast, scientific evidence on interactions between atmospheric components was relatively weak.

Context

A seventh summary factor that impacted the Law of the Atmosphere nonregime was *context*. This summary factor refers to issues and events separate from the issue under

consideration that affect regime formation. Two factors are relevant to understanding the Law of the Atmosphere nonregime.

> **Exogenous shocks or crises:** The occurrence of a shock or crises separate from the regime negotiating process increases the likelihood that the regime will form. Exogenous shocks and crises may help promote agreement on the terms of a contract. Crises may be manufactured by non-governmental organizations or the media. The media may also enhance the effects of exogenous shocks or crises on regime formation.
>
> **Contextual factors:** Opportunities provided by events and conditions unrelated to the issue under consideration may influence the likelihood of regime formation both positively and negatively. Large national and international events may influence regime formation even when they do not fall into the same policy area. Contextual factors can affect the timing and content of a regime in the process of formation.

The lack of a shock or crisis helps explain why a Law of the Atmosphere was not perceived to be necessary. The Vienna Convention took four years of hard work and negotiations. It was a framework agreement, designed to be strengthened by future protocols. Two months after the Vienna conference, the shock provided by the famous 'ozone hole' paper (Farman, Gardiner, and Shanklin 1985) had a demonstrable effect on negotiations for the Montreal Protocol. Negotiations were completed in a remarkably short amount of time and achieved far more than initially thought possible (Ozone Secretariat 2000). The Law of the Atmosphere did not benefit from a comparable shock.

The timing of the proposal for a Law of the Atmosphere also contributed to its demise. As mentioned numerous times, the idea had the misfortune to be introduced five years after conclusion of the Third Law of the Sea Conference, which resulted in an association of the umbrella Law of the Atmosphere with the long drawn out negotiations and yet to be ratified umbrella Law of the Sea, and the same year as the Montreal Protocol, which resulted in it being set in counterpoint to the efficient outcome of this single-issue agreement. In essence, the Law of the Atmosphere was never completely able to stand on its own merits.

Low influence factors

Interest and payoff

The interest and payoff summary factor was not influential on the Law of the Atmosphere nonregime. This summary factor represents a measure of the best interests and highest payoff of a party in relation to other parties. If regime formation is in a party's interest and offers an acceptable payoff, then a regime is more likely to form. Four interest and payoff factors help understand the Law of the Atmosphere nonregime.

> **Payoff structure:** Game-theoretic analysis deals with strategic behaviour, where a player's success is dependent on the actions of other players. It assumes that there is a unitary actor supplied with a clear payoff matrix. With numerical values, the payoff matrix specifies the benefits of mutual cooperation, mutual defection, unilateral defection, and unrequited cooperation. Each player weighs its choices relative to the potential choices of others and makes a rational decision based on all available information. International cooperation is likely to occur when its payoff is perceived by players as the best and most rational choice.
>
> **Relevant parties:** Every stakeholder must participate or be represented in regime negotiations to help achieve success and a lasting agreement. If all stakeholders are not present in critical stages of negotiations, then an excluded party may refuse to accept or even sabotage negotiations and/or the agreement.
>
> **Cost vs. benefits:** Cooperation to govern a commons is more likely when the cost of collaboration is less than the cost of individual action. If a resource is perceived to be valuable and worth the cost of management, then resource-users are more likely to create an organization for its protection. The perceived benefits of organization must also be higher than the perceived costs of organization. The perception that there are high benefits of organization are most likely to arise when resource-users have full and accurate information about resource dynamics, the benefits and costs of various actions and outcomes, and the history and reliability of other resource-users.
>
> **Issue linkage:** Linking negotiations of disparate issues expands the zone of possible agreement. Issue linkage strengthens incentives for cooperation by linking together different issues, with each issue having a different payoff matrix for each player involved. Issue linkage is most able to promote cooperation when the states involved have markedly asymmetric preferences. Issue linkage works best when one set of players value cooperation in one issue and not in another, while another set of players value the opposite. Linking issues is more profitable than separate negotiations and can deter free-riding while making agreements more stable.

Here I compare the interest and payoff of a Law of the Atmosphere to that of a climate convention. There is a significant overlap in the payoff of both approaches. For simplicity, only factors with different levels of payoff will be discussed.

The payoff for a climate convention would have been higher in terms of participation of relevant parties and ease of negotiations. Heavy emitters like the US and Britain were supporting creation of a climate convention but had little to say about a Law of the Atmosphere. Negotiations for a climate convention would be far less time consuming and complex than negotiations for an umbrella convention.

The payoff for a Law of the Atmosphere would have been higher in terms of opportunities for issue linkage. States could have asymmetrical preferences on acid rain, stratospheric ozone, and climate change regulation, and a Law of the Atmosphere would have facilitated trading across these issues. However, since these links were not well understood by scientists at the time, it would have been hard to pursue them.

Interest and payoff are not weighed heavily in this analysis of the Law of the Atmosphere nonregime because many factors incorporated into this summary factor encourage creation of both a climate convention and a Law of the Atmosphere. Instead, factors with different implications for the two regimes have been discussed. Neither a climate convention nor a Law of the Atmosphere was found to have a significantly better payoff in this limited analysis.

Power

A second non-influential summary factor relative to the Law of the Atmosphere nonregime is power. This summary factor is based in the argument that certain configurations

of power encourage regime formation. In this analysis, it was concluded that power had little influence on the Law of the Atmosphere nonregime. The Law of the Atmosphere never reached the negotiation phase, so power politics did not come into play. Canada was the only significant state actor favoring a Law of the Atmosphere, and while the US was not actively against a Law of the Atmosphere, it simply did not express support. The Law of the Atmosphere did not advance far enough to involve power as a reason for its failure to become a regime.

Summary of factors inhibiting the Law of the Atmosphere nonregime, 1988-1992

I am now in a position to answer my research question: *What factors explain why a Law of the Atmosphere failed to become a regime during its 1988 to 1992 window of opportunity?*

The first and most important factor is available solutions. Two main solutions to atmospheric change were available to policymakers: A step-by-step approach to protection of the atmosphere through a single-issue climate convention, and a Law of the Atmosphere as a comprehensive approach for all atmospheric problems. The step-by-step approach prevailed primarily due to the negative perception of the Law of the Sea, and the positive perception of the Montreal Protocol.

The second most important factor is the absence of leadership. The Law of the Atmosphere did not have any consistent or strong individual or state leaders championing its cause. In fact, it had Mostafa Tolba, a strong and influential leader, championing against it and for a climate convention.

The third most important factor is issue characteristics. The atmosphere is a complex and integrated whole that was not fully understood by scientists. Pursuit of international

regulation of the atmosphere in its entirety under a single umbrella convention was not viewed as a sound use of political resources during the window of opportunity for a Law of the Atmosphere.

Four factors were found to have moderate influence.

The first is policy area. Within the policy area for international environmental issues, global commons issues were darkened by the recent Law of the Sea experience. Also within this area, but specific to atmospheric issues, were the successful Montreal Protocol and ongoing negotiations for further regulation of stratospheric ozone and acid rain issues. In light of this mood and the limited capacity in the policy area, the Law of the Atmosphere was not a welcome addition.

The second is resource-user characteristics. Formation of a regime for a resource with users that include every human on earth is daunting prospect. However, the world has previously cooperated to protect its global commons with varying degrees of success. The perception of positive results from the step-by-step approach contributed to the formation of the climate regime, while the recent and negative perceptions of the Law of the Sea history contributed to the non-formation of the Law of the Atmosphere.

The third is knowledge. Knowledge about the interactions between different atmospheric components was weak and incomplete when a Law of the Atmosphere was under consideration. Knowledge about the dynamics of climate change was also uncertain, but seemingly to a lesser degree. Support for a climate change convention was further boosted by a strong epistemic community, the IPCC.

And the fourth is context. The proposal for a Law of the Atmosphere was not boosted by an unexpected shock on par with the famous ozone hole. No convincing research

suddenly surfaced to affirm the links between atmospheric components and the need for a Law of the Atmosphere. The Law of the Atmosphere was proposed in the same year as the Montreal Protocol and it fell in the gap between the conclusion of UNCLOS III and the treaty's entry into force. By virtue of timing, the Law of the Atmosphere was labeled and judged on the basis of these two treaties.

Two factors were found not to be influential: interest and payoff, and power. The payoff and interests in favour of a Law of the Atmosphere were not significantly different than those of a climate convention. Power was not found to impact the nonregime either because the Law of the Atmosphere did not advance far enough to engage more than one state actor (Canada). There were no power politics to play because most of the world ignored the idea.

Chapter 5: Conclusion

The results of my quest to understand the failure of a Law of the Atmosphere to form during its window of opportunity offers to international relations scholars theoretical insights and to policymakers a new perspective on the complexities and challenges faced in governing the atmosphere.

Contribution of study to nonregime theory

My research helps strengthen nonregime theory, a new area of international relations theory. First, it adds a global-scale case study. Second, it adds an organized methodology. If this methodology were to be applied consistently across a broad array of nonregime case studies, it may prove useful in revealing patterns that explain why certain issue areas fail to become governed by a regime. Dimitrov et al. (2007) suggest six nonregimes for further study: competition policy, information privacy, forest degradation, coral reefs management, tactical nuclear weapons, and small arms control. Third, my research produced at least one surprising theoretical result. According to regime theorists, power and interest are two of the most important considerations in regime formation. Relative to the Law of the Atmosphere nonregime, power was the lowest rated factor and interest was the second lowest. Incorporating commons theory and economic theory of international environmental cooperation allowed a more complete understanding of the Law of the Atmosphere nonregime beyond a simple reversal of regime theory.

Future research efforts to expand nonregime theory could take the preliminary method I offer and conduct a more exhaustive search for factors in the regime, commons, economic theory of international environmental cooperation, and other literatures. In

addition, the interactions and synergies between factors could be explored. I assumed the factors were single units of influence, and did not explore interactions among them. One avenue for exploring interactions would be to use Kingdon's (1995) classic political science study on agenda setting and the policy process. Kingdon argues that concrete policy outcomes are most likely to occur when three streams (political, policy, and problem) converge, and that a policy entrepreneur can be instrumental in facilitating this convergence. Using this model, more careful attention would be paid to the relationships between actors and factors.

What if? Speculations on a Law of the Atmosphere today

Given the nonregime outcome, I initially believed that the Law of the Atmosphere had never been taken seriously by the international community. I held this belief almost to the end of my research, when I finally received a reply from Canada's Department of Foreign Affairs and International Trade to a request I had made for information on the participants and proceedings of the 1989 Ottawa Meeting. I had expected the Ottawa Meeting to be stocked with only Canadians and a few Americans. The breadth of the participant list was totally unexpected, and revealed that the idea was not only well-known but also given serious consideration internationally. Despite this, states other than Canada took the same route as the US, which neither supported nor opposed it. Is it possible, though, that if conditions had been different, that we might today be living under a Law of the Atmosphere?

How would a Law of the Atmosphere fare if it was introduced today? The interpretation of the relative merits of a comprehensive versus a step-by-step approach would likely be different. The comprehensive approach, as exemplified back then by the slow-moving and seemingly stalled Law of the Sea, might be seen in a new light today. To date,

160 states have ratified the convention (Division for Ocean Affairs and Law of the Sea 2009). Two of its biggest holdouts, Britain and Germany, ratified it in the mid-1990s, but the US still has not. However, the Law of the Sea is now generally considered customary international law. The step-by-step approach, as exemplified at the time by the success of the 1987 Montreal Protocol, now has a less successful sister agreement in the Kyoto Protocol. The Kyoto Protocol commits industrialized parties to a reduction in greenhouse gas emissions. The US has refused to ratify the Kyoto Protocol, and many parties to the Protocol are not on track to meet their reduction targets for 2012. Thus, if introduced today, there might be less aversion to a comprehensive agreement and more scepticism of a single-issue agreement. This might enhance the chance of a Law of the Atmosphere succeeding today.

In addition, the early either/or relationship between a climate convention and Law of the Atmosphere might be viewed differently. These two solutions were treated as a choice between one or the other, yet the inventors of the Law of the Atmosphere idea intended for them to be developed concurrently. When viewed from this perspective, one of the key arguments against a Law of the Atmosphere falls apart; namely, the argument that real action on climate change would be delayed by lengthy negotiations for a comprehensive convention. Also, from today's perspective, while the negotiations for the Kyoto Protocol were relatively smooth and efficient, implementation of the protocol's mandate has been anything but smooth and efficient. Parallel work on a Law of the Atmosphere might have provided more opportunities for tradeoffs. For instance, developing countries are experiencing severe urban air pollution. Addressing this under a Law of the Atmosphere framework might make them more amenable to supporting developed country efforts to combat climate change.

Furthermore, from today's perspective, knowledge would play a significantly different role than it did 20 years ago. Knowledge on the interactions and interconnections between various atmospheric components is significantly stronger and more advanced. For example, the phenomenon of intercontinental and hemispheric transport of air pollution, sometimes referred to as "the globalization of air pollution," demonstrates more clearly the synergies between 'single' issues such as climate change, acid rain, tropospheric ozone, and dust in the atmosphere (Akimoto 2003; Stohl 2004; UNECE 2007).

In conclusion, if a Law of the Atmosphere were proposed today, would it be more likely to form? One of the people interviewed for this study speculated on where the world would be if a Law of the Atmosphere had been enacted: "If we had done it then, we would be in a better position than we are now." Another compared the step-by-step and comprehensive approaches to "fast food snacks [step-by-step] versus a large well-balanced meal [comprehensive]." The same interviewee felt that a Law of the Atmosphere is still "a good idea, but probably it was just before its time, and maybe the time will eventually come when we start putting all these treaties and international agreements concerning atmospheric pollution together under an umbrella agreement. I hope so."

A variety of factors worked against formation of a Law of the Atmosphere between 1988 and 1992. A different configuration would apply today. Most notably, available solutions and knowledge would shift in influence. Factors such as leadership and context would be different. Finally, instead of being judged by comparison to a single-issue convention, a Law of the Atmosphere would more likely be judged on its own merits. Thus, I can not argue that formation would be a certainty, but at the very least the factors influencing the likelihood of success would be different.

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Appendix 1: Interviews

Table 5: List of interviewees

Interviewee	Date interviewed	Role in Law of the Atmosphere 1988-1992
Robert Slater	October 23, 2009	• Assistant Deputy Minister of Policy • Participated in 1989 Ottawa Meeting
Jill Jäeger	October 23, 2009	• Organized and reported results of 1987 Bellagio Workshop • Organized and reported results of 1988 Toronto Conference
Howard Ferguson	October 27, 2009	• Assistant Deputy Minister of AES • 1988 Toronto Conference Director • Participated in 1989 Ottawa Meeting • Authored draft Law of the Atmosphere incorporated into 1989 Ottawa Meeting Statement
Edward Miles	November 25, 2009	• Consultant for American government on a Law of the Atmosphere
Nigel Bankes	January 21, 2010	• Consultant for Canadian government on a Law of the Atmosphere • Participated in 1989 Ottawa Meeting

Interview Questions:

1. How were you involved in the Law of the Atmosphere?

2. Why do you think that the Law of the Atmosphere did not become a treaty? Are any of these reasons more or less important than the others?

3. Is there anything else you would like to add about the Law of the Atmosphere?

4. Is there anyone who was involved in the Law of the Atmosphere that you think I should contact for my research project?

Appendix 2: Draft principles for a Law of the Atmosphere

From the Statement of the Meeting of Legal and Policy Experts, February 22, 1989:

A. The following elements should be addressed in any framework "umbrella" convention on protection of the atmosphere:

1. Atmosphere

The following two variants are proposed for the definition of atmosphere:
"Atmosphere" means the resource constituted by the global mass of air surrounding the earth.

"Atmosphere" means all or part of the collection of gases which lie within the limits of the troposphere and stratosphere as defined by the WMO international standard atmosphere.

2. Atmospheric interference

"Atmospheric interference" means any change in the physical or chemical condition of the atmosphere resulting directly or indirectly from human activities and producing effects of such a nature as to appreciably endanger human health, harm living resources, ecosystems and material property, impair amenities or interfere with other legitimate uses of the environment;

"International atmospheric interference" means any atmospheric interference of which not both the origin and the effects are wholly located within the area under the national jurisdiction of one State.

Note: The notion of "atmospheric interference" was found useful as a key to the obligations of the Convention. It should include both the elements of appreciable danger and appreciable harm (or any other adjective such as "significant", "substantial", etc.) depending on the degree of tolerance to harm [threshold] that may be adopted. When the interference affects the atmosphere globally, qualifying it as "international" seems unnecessary.

3. Common resource of vital interest

Without prejudice to the sovereignty of States over the airspace superjacent to their territory as recognized by international law, arid for the purposes of this Convention, the atmosphere, as defined, constitutes a common resource of vital interest to mankind.

4. Obligation to protect and preserve the atmosphere

States have the obligation to protect and preserve the atmosphere.

5. Sovereign right of States to permit human activities and the limits thereto

The sovereign right of States to permit in their territories or under their jurisdiction or control all human activities that they consider appropriate must be compatible (must conform) with their obligations to protect and preserve the atmosphere.

Note: For historical reasons and because it contains a relevant principle of international law, transcription of Principle 21 of the Stockholm Declaration should be included in the preamble.

6. Implementation of the Convention through protocols

The contracting parties shall endeavour to enter into protocols for the implementation of the obligations of this convention with contracting parties and non-contracting parties regarding atmospheric interferences.

7. Measures to prevent, reduce or *control*

States shall take all appropriate measures to prevent, reduce or control any international atmospheric interference or significant risk thereof arising from activities under their jurisdiction or control. To this end they shall, in accordance with the best practicable means at their disposal and their capabilities, develop and implement policies and strategies and as a part of them control measures taking into account the nature, extent and effects of the atmospheric interference and the extent to which the atmospheric interference arises from activities under their jurisdiction or control.

8. No transfer of damage or hazards or transformation of one type of atmospheric interference into another interference

In taking measures to prevent, reduce or control international atmospheric interferences, States shall act so as not to transfer, directly or indirectly, damage or hazards from one area to another area or transform one type of atmospheric interference into another type of international atmospheric or other environmental interference.

Note: Accepted, with the proviso that the text should convey the idea that the rule therein contained cannot be applied rigidly, as is recognized in the commentary of the Report by Professor Lammers.

9. Additional domestic measures

The provisions of the Convention shall in no way affect the right of the Contracting Parties to maintain or adopt additional domestic measures, provided that these measures are not incompatible with the obligations of the Contracting Parties under the Convention.

10. Bilateral, multilateral or regional agreements and arrangements

(1) The Contracting Parties may enter into bilateral, multilateral or regional agreements or arrangements with Contracting Parties and Non-Contracting Parties regarding. atmospheric interferences, provided such agreements or arrangements are not incompatible with the object and purposes of this Convention.
(2) The provisions of this Convention shall not affect any agreements or arrangements, referred to in paragraph 1 above, which the Contracting Parties have entered into prior to the entry into force of this Convention for them for the purpose of preventing, reducing or controlling atmospheric interferences, provided the provisions of such agreements or arrangements are not incompatible with the object and purposes of this Convention.

11. General obligation to co-operate

States shall co-operate, directly or through competent international organizations, to protect the atmosphere.

12. Policies and Strategies

States shall, in accordance with the means at their disposal and their capabilities, co-operate in the elaboration, formulation, co-ordination or harmonization of policies and strategies including measures to prevent, reduce or control activities under their jurisdiction or control causing or likely to cause atmospheric interferences.

13. Exchange of Information

States shall exchange scientific, technical, socio-economic, commercial and other information relevant for the protection of the atmosphere, and facilitate and encourage the exchange of such information.

Note: The question of the treatment of *confidential* information will require consideration in the drafting of a conventional provision on this matter.

14. Research and Systematic Observations

(1) States shall, as appropriate, and in accordance with the means at their disposal and their capabilities, undertake, promote and co-operate in the conduct of systematic collection and transmission of data, research and scientific assessments on:

(a) the state of the atmosphere;

(b) activities, practices, processes and substances that may cause international atmospheric interferences;

(c) alternative activities, practices, processes and substances and their socioeconomic and environmental implications, aimed at preventing, reducing or controlling international atmospheric interferences;

(d) the nature and extent of the effects of any modifications of the atmosphere on human health, living resources and ecosystems, material property, amenities and other legitimate uses of the environment.

(2) States shall promote the role of appropriate world data centres in ensuring the validation and transmission of observational data.

15. Development and transfer of technology

In order to prevent, reduce and control atmospheric interferences and taking into account in particular the needs of developing countries, States shall co-operate in promoting the development and transfer of relevant technologies and the provision of technical assistance.

16. Prior notice and environmental impact assessment of planned activities

When a State has reasonable grounds for believing that planned activities under its jurisdiction or control may cause an atmospheric interference outside such jurisdiction, it shall:

(a) give timely notice to the competent international organization [and to the other States concerned];

(b) make an assessment of the potential effects of such activities before carrying out or permitting the planned activities;

(c) on its own initiative or upon request of the competent international organization [or of the other States concerned], provide such relevant information as will permit the competent international organization [or the other States concerned] to make an assessment of the probable effects of the planned activities.

Note: Texts between [] are applicable in the context of the protection of the atmosphere but should be deleted for the purposes of an instrument on climate protection.

This principle would be appropriate for a subsidiary instrument, but would require further consideration for inclusion in a framework convention.

17. Consultations

(1) Consultations shall be held, upon request, at an early stage between, on the one hand, the competent international organization and States concerned and, on the other hand, States under whose jurisdiction or control activities which require prior notice are planned.

(2) Consultations shall also be held, upon request, once such activities are being carried out.

18. Emergency situations

(1) When a State becomes aware of an emergency situation or other change of circumstances arising from incidents or activities under its jurisdiction or control and suddenly giving rise to an atmospheric interference or significant risk thereof causing or likely to cause harm in ail area under the jurisdiction of another State or in an area beyond the limits of national jurisdiction, it shall immediately take appropriate measures, to control the cause of the

emergency situation and immediately notify other States affected or likely to be affected by such an atmospheric interference, as well as the competent international organizations.
(2) It shall provide those States and organizations with such pertinent information as will enable them to minimize the harmful effects of the atmospheric interference and co-operate with them, in order to prevent or minimize the harmful effects of an emergency situation or other change of circumstances referred to in paragraph 1.
(3) States shall develop contingency plans in order to prevent or minimize the harmful effects of such an emergency situation or other change of circumstances referred to in paragraph 1.

Note: This principle would not be suitable for an instrument on climate protection.

19. Liability, compensation or *other relief*

Contracting Parties shall develop appropriate principles of liability, compensation or other relief under relevant protocols.

Note: In relation to a convention on climate change, certain novel ideas concerning liability and compensation were considered in workshop 3 and recommended for further elaboration.

20. Peaceful settlement of disputes

(1) If a dispute arises concerning the interpretation or application of this Convention, the parties to the dispute shall, at the request of anyone of them, consult among themselves as soon as possible with a view to having the dispute resolved by negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to means of peaceful settlement provided for by a competent international organization, or other peaceful means of their own choice.
(2) If the parties to a dispute concerning the interpretation or application of this Convention have not agreed on a means of resolving it within 12 months of the request for consultation pursuant to paragraph 1 above, the dispute shall be referred at the request of any party to the dispute, for settlement in accordance with the procedure determined by the operation of paragraphs 6, 7 and 8 below.
(3) Paragraph 2 above shall similarly apply in the event that the dispute has not been resolved within 18 months after the parties to the dispute agree on a means of resolving the dispute other than through arbitration or settlement of the dispute by the International Court of Justice, unless the parties otherwise agree.
(4) Each Contracting Party, when signing, ratifying, accepting, approving or acceding to this Convention, or at any time thereafter, may declare that it accepts as compulsory one or both of the following means for the settlement of disputes concerning the interpretation or application of this Convention:

(a) submission of the dispute to the International Court of Justice;

(b) submission of the dispute to arbitration in accordance with Annex [X] to this Convention.

(5) A declaration made under paragraph 4 above shall not affect the operation of paragraphs 1, 2 and 3 above;

(6) A Contracting Party that has not made a declaration under paragraph 4 above or in respect of which a declaration is no longer in force, shall be deemed to have accepted submission of the dispute to the International Court of Justice.
(7) If the parties to a dispute have accepted the same means for the settlement of a dispute referred to in paragraph 4 above, the dispute may be submitted only to that procedure, unless the parties otherwise agree.
(8) If the parties to a dispute have not accepted the same means for the settlement of a dispute referred to in paragraph 4 above, or if they have both accepted both means, the dispute may be submitted only to the International Court of Justice, unless the parties otherwise agree.
(9) The provisions of this principle shall apply with respect to any protocol to this Convention except as otherwise provided in the protocol concerned.

21. World Atmospheric Trust Fund

States should consider the possibility of establishing a World Atmosphere Trust Fund. The beneficiaries of the Trust Fund should be developing countries.

22. Co-ordination of existing institutional arrangements

States should consider co-ordinating and integrating the institutional arrangements for the various atmosphere-related regimes, such as the Vienna Ozone Convention and the ECE Convention on Long-range Transboundary Air Pollution, and their protocols.

23. Monitoring

States should consider whether any monitoring system established under the Convention might usefully serve to provide early warning and to integrate and coordinate monitoring systems worldwide.

24. Participation in the convention

The Convention and any protocol shall be opened for signature or accession by States and by regional economic organizations. The question of the form of participation of other international organizations in the Convention requires further consideration.