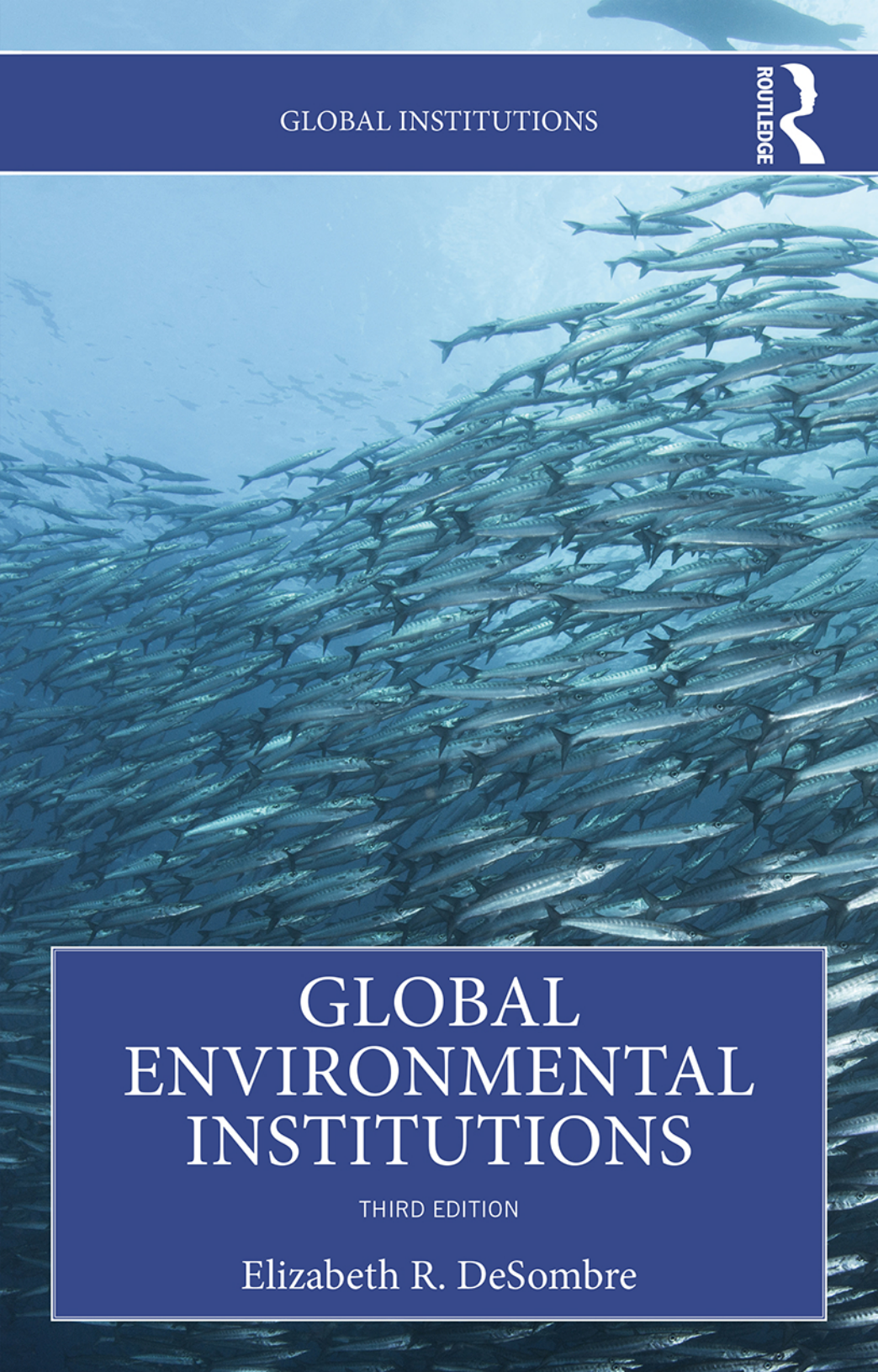




GLOBAL INSTITUTIONS



GLOBAL ENVIRONMENTAL INSTITUTIONS

THIRD EDITION

Elizabeth R. DeSombre

Global Environmental Institutions

Global Environmental Institutions provides the most accessible and succinct overview of the major global institutions attempting to protect the natural environment, describing their creation and operation, decision-making processes, interactions with other institutions, and impact. Fully updated throughout, this third edition maintains the clear structure of previous editions, examining the

- underlying causes of global environmental problems
- creation of global environmental institutions
- effectiveness of action undertaken by these institutions.

Providing an overview of the United Nations Environment Programme alongside other entities that play important roles in global environmental governance, this book examines institutions by issue area and introduces organizations with a specific focus on protecting endangered species and biodiversity, the atmosphere, the ocean environment, and regulating the transboundary movement of hazardous substances. Drawing on the latest scholarship, and written by an acknowledged expert in the field, this study is essential reading for students of environmental politics and international organizations.

Elizabeth R. DeSombre holds an endowed chair in environmental studies at Wellesley College, where she teaches courses in ES and political science, primarily focusing on international environmental politics. She has published eight books, most of which focus on international environmental politics.

Global Institutions

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The “Global Institutions Series” provides cutting-edge books about many aspects of what we know as “global governance.” It emerges from our shared frustrations with the state of available knowledge—electronic and print-wise—for research and teaching. The series is designed as a resource for those interested in exploring issues of international organization and global governance. And since the first volumes appeared in 2005, we have taken significant strides toward filling many conceptual gaps.

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Global Environmental Institutions

Third Edition

Elizabeth R. DeSombre

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Elizabeth R. DeSombre
Wellesley College
December 2023

Acronyms and Abbreviations

ABS	Protocol on Access and Benefit Sharing
ACFR	Advisory Committee on Fishery Research
AEAP	African Elephant Action Plan
AIA	Advanced Informed Agreement
BAT	Best Available Technology
BBNJ	Biodiversity Beyond National Jurisdiction
BEP	Best Environmental Practices
BRS	Basel-Rotterdam-Stockholm Conventions combined secretariats
CBD	Convention on Biological Diversity
CCAMLR	Convention (or Commission) for the Conservation of Antarctic Marine Living Resources
CCOL	Coordinating Committee on the Ozone Layer
CCP	Cities for Climate Protection
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CDM	Clean Development Mechanism
CFCs	chlorofluorocarbons
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLRTAP	Convention on Long-Range Transboundary Air Pollution
CMS	Convention on the Conservation of Migratory Species
CO ₂	Carbon dioxide
COP	Conference of the Parties
CPR	Committee of Permanent Representatives
CPRs	common pool resources
CSD	Commission on Sustainable Development
DEWA	Division of Early Warning and Assessment (of UNEP)
DGD	Decision Guidance Document
DNAs	Designated National Authorities
DDT	dichlorodiphenyltrichloroethane
EANET	East Asian Acid Deposition Monitoring Network
ECOSOC	Economic and Social Council

EEAP	Environmental Effects Assessment Panel
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMEP	Cooperative Program for Monitoring and Evaluation of Long-Range Transmission of Air Pollutants in Europe
ENFORCE	Environmental Network for Optimizing Regulatory Compliance on Illegal Traffic
ETIS	Elephant Trade Information System
EU	European Union
ExCom	Executive Committee
FAO	Food and Agriculture Organization
GBF	Kunming-Montreal Global Biodiversity Framework
GEF	Global Environment Facility
GEMS	Global Environmental Monitoring System
GEO	Global Environmental Outlook (Yearbook)
GFCM	General Fisheries Commission for the Mediterranean
GMOs	Genetically Modified Organisms
GNP	Gross National Product
GRID	Global Resource Information Database
HBFCs	hydrobromofluorocarbons
HCBs	hexachlorobenzenes
HCFCs	hydrochlorofluorocarbons
HFCs	hydrofluorocarbons
HLPF	High-Level Political Forum for Sustainable Development
IATTC	Inter-American Tropical Tuna Commission
IBSFC	International Baltic Sea Fisheries Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
ICFS	Intergovernmental Forum on Chemical Safety
ICLEI	International Council for Local Environmental Initiatives (originally; now simply uses the acronym)
ICPs	International Cooperative Programs
ICRW	International Convention for the Regulation of Whaling
IFCS	Intergovernmental Forum on Chemical Safety
IIASA	International Institute for Applied Systems Analysis
IJC	International Joint Commission
ILO	International Labour Organization
IMO	International Maritime Organisation
INC	Intergovernmental Negotiating Committee
IOMC	Inter-Organization Program on the Sound Management of Chemicals
IOTC	Indian Ocean Tuna Commission
IPCC	Intergovernmental Panel on Climate Change

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IPEN	International POPs Elimination Network
IRPTC	International Register of Potentially Toxic Chemicals
ISA	International Seabed Authority
ISM Code	International Safety Management Code
ISPS	International Ship and Port Facility Security Code
ITLOS	International Tribunal for the Law of the Sea
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUCN	International Union for Conservation of Nature
IWC	International Whaling Commission
LMOs	Living Modified Organisms
LULUCF	land use, land-use change, and forestry
MAP	Mediterranean Action Plan
MARPOL	International Convention for the Prevention of Pollution from Ships
MAT	Mutually Agreed Terms
MDGs	Millennium Development Goals
MeBr	methyl bromide
MEPC	Maritime Environment Protection Committee
MIKE	Monitoring the Illegal Killing of Elephants
MOP	Meeting of the Parties
MOU	Memorandum of Understanding
MPA	Marine Protected Areas
MSC	Maritime Safety Committee
NAFO	Northwest Atlantic Fisheries Organization
NAFTA	North American Free Trade Agreement
NASA	United States National Aeronautics and Space Administration
NASCO	North Atlantic Salmon Conservation Organization
NEAFC	Northeast Atlantic Fisheries Commission
NGOs	Non-governmental organizations
Nox	Nitrogen Oxides
NPAFC	North Pacific Anadromous Fish Commission
OAU	Organization of African Unity
ODP	Ozone Depletion Potential
ODS	Ozone Depleting Substance
OECD	Organisation for Economic Cooperation and Development
OEWG	Open-Ended Working Group
OPS	overall performance study
PCBs	polychlorinated biphenyls
PFAS	Per- and Polyfluorinated Substances
PIC	Prior Informed Consent
PICES	North Pacific Marine Science Organization
POPs	Persistent Organic Pollutants

RFMOs	regional fishery management organizations
SAICM	Strategic Approach to International Chemicals Management
SAP	Scientific Assessment Panel
SBSTTA	Subsidiary Body on Scientific, Technical, and Technological Advice (of the CBD)
SDGs	Sustainable Development Goals
SO ₂	Sulphur Dioxide
SOLAS	Convention for the Safety of Life at Sea
STCW	International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers
TCC	Technical Cooperation Committee (IMO)
TEAP	Technology and Economic Assessment Panel
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCHE	United Nations Conference on the Human Environment
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEA	United Nations Environment Assembly
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
VOCs	Volatile Organic Compounds
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development
WCMC	World Conservation Monitoring Centre
WCPFC	West and Central Pacific Fisheries Commission
WCS	World Conservation Strategy
WHC	World Heritage Convention (Convention Concerning the Protection of the World Cultural and Natural Heritage)
WHO	World Health Organization
WMO	World Meteorological Organization
WRI	World Resources Institute
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization
WWF	World Wildlife Fund/World Wide Fund for Nature; usually goes only by its acronym



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1 Introducing Global Environmental Institutions

The global environment is threatened. Species are becoming extinct at levels not experienced except during major global catastrophes. Most major commercial fisheries are depleted, and ocean ecosystems are disrupted. The problem of acid rain is spreading to newly industrializing areas, plastic pollution is causing major threats to ocean ecosystems and elsewhere, and we are regularly discovering the harms of pervasively used substances like mercury and per- and polyfluorinated substances (PFAS). The continued generation of toxic waste and the global movement of toxic substances cause harm to vulnerable populations far away from where these substances are initially used. Global climate change threatens to intensify many existing environmental problems and cause new ones, with rising sea levels and changing patterns of temperature and precipitation that will affect ecosystems worldwide.

Many of the efforts to address these problems have taken place within international institutions, the focus of this book. An examination of institutions that govern the protection of the global environment is a daunting task. Unlike some issues, such as international trade, in which one large centralized organization provides most of the governance internationally, there is no centralized governance on international environmental issues. The United Nations plays an important role; the United Nations Environment Programme (UNEP) has facilitated the negotiation of many international environmental agreements, acts as the secretariat for some, and plays a role in coordinating international scientific research. But even the organizations UNEP oversees have their own internal governing processes, and there are numerous institutions without UNEP involvement.

The number of international institutions addressing global environmental issues is large and rapidly growing. One study identified 125 distinct international environmental regimes (most of them creating organizations) existing in 1992 and another suggested that by 2011 there were more than 200;¹ even more exist today. This volume focuses on a

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subset of these institutions. It first considers UNEP and the other institutional entities within the United Nations that play important roles in global environmental governance. It then examines institutions clustered by issue area, looking at those that focus on protecting endangered species and biodiversity, those that govern the ocean environment, those focusing on the atmosphere, and a recent set of institutions that focus on the trans-boundary movement of hazardous substances. The volume concludes with an examination of international efforts to fund the activities overseen by global environmental institutions, the recalcitrance of the United States toward full participation in these institutional processes, and the efforts of organizations with overlapping goals, or intersecting mandates, to cooperate.

The number and variety of existing global environmental institutions also makes impossible a consideration of all of them in one volume. The ones examined here are those deemed particularly important and also those that fit into thematically organized chapters that focus on specific issue areas. There are some important emerging issues, such as forest management and desertification, that have institutional structures that are not discussed here at length, despite their increasing prominence.

A word should also be said about what is considered an "institution." Though there are some free-standing organizations, such as UNEP or the International Maritime Organization, that focus on multiple issues, most of the issue-based entities discussed in this volume are organized around a specific international agreement. These agreements, or treaties, designate secretariats and have headquarters and voting procedures for making decisions within their area of competence. By that broad definition there are hundreds of global environmental institutions in existence. In choosing ones to examine here, priority was given to those institutions that are empowered with independent decision-making ability. Fisheries commissions set annual quotas and policies for the fisheries they oversee. The Conference of the Parties for the Convention on Migratory Species decides which species will be listed for protection. The Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer can adjust the control measures parties have to follow. Weaker institutions such as the Convention on Wetlands of International Importance Especially as Waterfowl Habitat have no provision for changing the obligations of the parties. The independence of the stronger institutions should not be overstated: most regional fishery management organizations have a process by which states may opt out of commission rules they do not wish to follow, and states may always choose not to ratify an amendment or may even withdraw from an agreement altogether. Nor should the weaknesses of the others: the wetlands convention organization has found ways to adapt to the concerns of its parties over time. Ultimately, though, it is the ability to act to govern the issue areas on

which they focus that makes the institutions considered here especially important.

Examining institutions, the focus of the series in which this book appears, of necessity leaves out some important action on international environmental issues. Perhaps more than in other international issues, much of what happens of relevance to environmental protection happens alongside, and sometimes completely apart from, institutions. Action undertaken by activist organizations, national or multinational industry actors, and national or subnational governments has a dramatic impact on the issues explored here. In some cases this extra-institutional activity helps motivate the creation of institutions, or influences action within existing institutions. And in some cases, such as the innovative non-state action undertaken on climate change,² this activity occurs when international institutions appear unlikely to succeed in addressing the problem. Those interested in global environmental politics would be wise to pay attention to these types of actors and the broader issue of global environmental governance.

The institutions addressed in this volume play a major role in addressing environmental issues on the global level. International cooperation is both necessary and difficult for mitigating environmental problems, and the institutions described in this volume work to address the specific types of difficulties faced in international environmental cooperation.

On the one hand, cooperation to address some environmental issues has some structural advantages. Most environmental resources regenerate, so in many cases successfully managing the environment can benefit everyone involved. If fishers can cooperate in limiting the number of fish they catch to a sustainable level, they can continue to fish indefinitely. Pollutants put into ecosystems are eventually removed or made inaccessible by natural processes, so eliminating the source of damage can often improve an environmental amenity. Environmental harms often are externalities of other activities: almost no one sets out to destroy the environment. But a set of incentive structures, some inherent and others the result of political and economic processes, can result in environmental degradation if international action is not taken.

The fact that environmental damage is not intentionally created ironically provides some of the difficulties in preventing it. Because there is often no direct economic cost to harming the environment (at least to the actors undertaking the harm), changing behavior to avoid doing so may be costly. Those whose behavior would have to change are likely to resist action, and important economic actors whose behavior damages the environment tend to have a disproportionate influence politically.³ States, as sovereign entities under international law, do not have to accept international agreements or join international institutions they do not wish to participate in. But environmental damage is often experienced

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internationally regardless of the location of the activity that causes it, so many problems require widespread participation to be addressed successfully. Moreover, even when states know they benefit from cooperative action to protect the environment, they may prefer to let others undertake costly action and gain from the environmental benefits generated by others without having to bear the costs themselves. If enough states take this approach, international cooperation will fail.

These difficulties are augmented by two additional problems faced by efforts to sustain cooperation on environmental issues: time horizons and uncertainty. Environmental protection works to ensure long-run benefits for those who sacrifice in the short run. For a hunter, for example, the cost of ensuring a perpetual ability to harvest seals (or bears or antelope) may be to take fewer of them this year than that hunter would have otherwise chosen to do. But this tradeoff is only worthwhile if the species is successfully protected and the hunter is able to continue to hunt in the reasonable future. If other actors do not successfully restrict their behavior (either because they have not agreed to do so or because they do not live up to their agreements), the hunter has given up access to resources for no eventual gain. Actors are not likely to restrict their behavior unless they can be reasonably certain they will gain in the long run from their sacrifice.

An essential role of international institutions is to increase the likelihood that states will make, and then live up to, commitments to protect the environment. An institution can do so by increasing transparency; in other words, by making it easier for others to know when actors are, or are not, living up to their obligations. Reporting requirements, for example, make it easier to determine when states are not doing what they have agreed to do. Increasingly intrusive types of monitoring (such as mandating observers on fishing vessels) have recently been created within existing institutions to overcome the potential unreliability of self-reporting. The European agreements on acid rain include a monitoring process that is able to evaluate the accuracy of emissions data reported by states. Institutions can also increase the likelihood of implementation by establishing penalties for those who do not follow the rules set by the institution. Though strong enforcement mechanisms are rarely found in international environmental institutions, the Convention on International Trade in Endangered Species has called for the cessation of all species trade with some states that have poor records of upholding the requirements of the agreement.⁴ And if states are unable to live up to their obligations because they lack the capacity to do so, institutions can help with that as well; a recent trend in "compliance mechanisms" within international environmental institutions has been to make them nonconfrontational, focusing on funding and technical assistance rather than punishment.

If the information underlying the cooperative effort – how many members of a given species exist, how (and how quickly) restrictions on hunting or harvesting will impact the regeneration of the species, what other factors are implicated in the decline of the species – is uncertain, even restricting harvesting may not have the promised payoff. So even in protecting renewable resources, which from the perspective of incentive structures is easier to address than many other global environmental problems, uncertainty increases the difficulty of doing so. For pollution issues uncertainty may cause even greater problems: it may not be clear what the cause of a polluted ecosystem is, and since those actors causing pollution will frequently not directly benefit from preventing it, they will resist action as long as the cause can be questioned. (They may even contribute misleading information to perpetuate the uncertainty, as has been central in the efforts to address climate change.) For problems like ozone depletion or climate change, where the long residence time of the chemicals hypothesized to cause environmental damage requires that action be taken long before effects are clearly manifest, uncertainty is magnified and cooperative action more difficult.

International institutions can work to decrease uncertainty. Most environmental agreements begin by creating scientific assessment bodies as a part of the institutional structure of the agreement. These scientific committees study the resource in question, determining the level and cause of environmental harm. Associated requirements that states examine and report on their own behavior and environmental conditions generate further information to use in evaluating a given problem. The recent trend toward creating general framework conventions without substantive obligations for states reflects situations in which policymakers argue that there is insufficient evidence of environmental damage or its human causes to justify costly action. In many issues, such as ozone depletion and acid rain, the scientific processes in these institutions informed states that environmental damage was more extensive than they realized and states were willing to change their behavior once they realized the severity of the environmental problems.

International environmental institutions vary in their effectiveness at addressing the problems on which they focus. The following chapters describe the creation and operation of the major global environmental institutions, discussing their decision-making processes, their interactions with other institutions, and the effects they have had. One impact of the multiplicity of existing environmental institutions is the opportunity it provides to consider them comparatively and the likelihood that new institutions created can take account of the lessons learned from the operations of existing ones. This volume attempts to provide information for those who wish to do so.

Notes

- 1 Sebastian Oberthür and Thomas Gehring, "Reforming International Environmental Governance: An Institutional Perspective on Proposals for a WEO," in Frank Biermann and Steffen Bauer, ed., *A World Environmental Organization* (Aldershot: Ashgate, 2005), 206; E.D. Dellas, P.H. Pattberg, M. Kok, S. Frantzi, M. de Vos, P.Janssen, F. Biermann, and A.C. Petersen, *Modelling Governance and Institutions for Global Sustainability Politics (ModelGIGS). Theoretical Foundations and Conceptual Framework* (IVM-report (W-11/05)). IVM Institute for Environmental Studies and PBL Netherlands Environmental Assessment Agency, 10 June 2011, 5.
- 2 See, for example, Matthew J. Hoffmann, *Climate Governance at the Crossroads: Experimenting with a Global Response after Kyoto* (Oxford: Oxford University Press, 2011).
- 3 David Vogel, "Representing Diffuse Interests in Environmental Policymaking," in R. Kent Weaver and Bert A. Rockman, ed., *Do Institutions Matter? Government Capabilities in the United States and Abroad* (Washington DC: The Brookings Institution, 1993), 237–271.
- 4 Peter H. Sand, "Enforcing CITES: The Rise and Fall of Trade Sanctions," *Review of European, Comparative & International Environmental Law* 22 (2013), 251–263.

2 United Nations Environment Machinery

UN Overview

In order to examine the environmental machinery of the United Nations it helps to begin with a basic understanding of how the organization as a whole works. The core of the United Nations is composed of six principal organs: the Secretariat, General Assembly, Security Council, Economic and Social Council (ECOSOC), the International Court of Justice, and the Trusteeship Council, the latter of which has functionally ended since all territories it oversaw have achieved self-governance or independence. The United Nations has a number of component parts that focus on the environment, almost all of them either under the rubric of the General Assembly (where resolutions are passed to set up the institutional structures described in this chapter or to approve their work product) or of ECOSOC. Decisions by the General Assembly do not, on their own, bind states, but they reflect and can influence international opinion. When the General Assembly votes to approve the work of subsidiary institutions, states gain no new obligations. The United Nations machinery pertaining to the environment is thus weak from the perspective of compelling action from states.

Much of the actual action undertaken by the United Nations is conducted through Programs and Funds of the organization. These entities of the United Nations officially report to the General Assembly but have their primary working relationship with ECOSOC. The United Nations Environment Programme (UNEP) is the program most directly involved with environmental issues within the United Nations. Other programs, most prominently the United Nations Development Programme (UNDP), sometimes work with UNEP on environmental issues.

The UN also makes use of Commissions, which report directly to ECOSOC. The High Level Political Forum on Sustainable Development (formerly the Commission on Sustainable Development) is the primary organization of this type addressing environmental issues. Regional commissions are also in this administrative position; the United Nations

Economic Commission for Europe (UNECE) is also engaged in environmentally relevant work, primarily related to air pollution, energy, and municipal planning. The United Nations Forum on Forests is another UN body affiliated with ECOSOC that undertakes environmentally relevant action.

UN Specialized Agencies function largely as independent organizations but work under the broad umbrella of the United Nations and coordinate with each other and the United Nations under ECOSOC. Though not required to, they often submit reports to the General Assembly. Of these, several have contributed in important ways to environmental protection. The United Nations Food and Agriculture Organization (FAO) is concerned with food safety including the role of pesticides, which has led to its involvement in international governance of hazardous chemicals (see Chapter 6). Its concern with the international food supply has led it to play a strong role in the study, if not the regulation, of international fisheries (see Chapter 4). The United Nations Educational, Scientific and Cultural Organization (UNESCO) oversees agreements protecting the common heritage of humankind. The World Health Organization (WHO) has played an important role in examining the health consequences of environmental issues. The World Meteorological Organization (WMO) conducts research relating to climate change and ozone depletion.

Also of central importance in the development of institutions that oversee international environmental issues are several large international conferences organized by the United Nations to develop principles and institutions for environmental governance. The most influential of these have been the United Nations Conference on the Human Environment (UNCHE) held in 1972 in Stockholm, and the United Nations Conference on Environment and Development (UNCED) held in 1992 in Rio de Janeiro, as well as the follow-up conferences related to each of these. These are created by the General Assembly, but have been more directly overseen and negotiated by UNEP and other sustainable development governing processes.

United Nations Environment Programme

UNEP is the closest thing there is to an overarching global institution for the environment. The organization is intended both to coordinate the environmental aspects of United Nations operations and to catalyze further environmental action. UNEP has played active roles in environmental monitoring and scientific research on environmental issues; has worked to build the capacity of states, non-state actors, and other international institutions to negotiate and implement international environmental agreements; and has coordinated and supported the negotiation of international environmental agreements. In addition to playing a coordinating

function in global environmental governance generally, it has undertaken specific programs to address international environmental issues; notable among these is its regional seas program.

UNEP was founded by Resolution 2997 of the General Assembly of the United Nations in 1972. It was created as a specialized agency of the United Nations, reporting to the Economic and Social Council (ECOSOC). The General Assembly was acting on a recommendation from the United Nations Conference on the Human Environment in Stockholm that year (see below), which advocated the creation of a secretariat, governing council, and environment fund, all of which would work for the "protection and improvement of the human environment."¹ UNEP was intended to play a catalytic role, coordinating the environmental activities of other UN agencies.

From the beginning there were arguments about what kind of body within the UN should be created to address environmental issues. Opinions differed about whether it should be a UN agency or a (weaker, in UN governance) program, how independent it should be, and how it would be funded. UN Secretary General U Thant had expressed an interest in creating an agency that would act as a "switchboard" to bring together existing capacities within the UN system, rather than creating a strong and purely independent agency.² Thant's view did, however, involve an organization that could "police and enforce its decisions."³

Some, primarily small European states, preferred an entirely independent agency within the UN, with strong enforcement powers. One idea that was floated before the Stockholm conference was that the Trusteeship Council, having carried out its intended function, should be transformed into an Environment Council. Related proposals would have created an organization separate from, but on equal footing with, ECOSOC.⁴

At the other extreme, there were those who argued that the task of addressing the environment could be conducted within existing UN organizations (such as UNDP) or that different environmental issues could be divided up to be addressed by organizations such as the World Meteorological Organization, the International Maritime Organization, the Food and Agriculture Organization, or the World Health Organization simply by modifying their mandates. Developing countries were also wary of the creation of a global environmental institution within the United Nations, expressing a preference for regionally based approaches focusing on specific environmental problems or locations.⁵

Some of the strongest states in the system – the United States, the United Kingdom, and France – also strongly opposed the creation of a strong and independent agency. They preferred the creation of a program and argued that its funding should be voluntary.⁶ The compromise position was close to that advocated by the powerful states: to create UNEP as a program, funded through voluntary donations. From the beginning the

role of this new institution was downplayed: the General Assembly resolution creating UNEP notes that “responsibility for action to protect and enhance the environment rests primarily with Governments and, in the first instance, can be exercised more effectively at the national and regional levels.”⁷

UNEP’s main office is in Nairobi, Kenya, making it the first major United Nations organization to be headquartered in a developing country. The decision to locate the organization in the developing world was deliberate but somewhat contentious. Many supported the idea of widening the reach of the United Nations, especially because of the important connection between environment and development and the need to persuade developing countries that a UN focus on the environment could benefit them.⁸ Some negotiators from developed states, however, expressed concern that if the primary role of UNEP was to be coordination among existing UN institutions, then situating it near those institutions would be wise.⁹

The organization also has regional offices focusing on Europe, Africa, North America, Asia and the Pacific, Latin America and the Caribbean, and West Asia. Other UNEP employees serve in the secretariats for international agreements throughout the world or liaison offices with various regional agreements, but the Nairobi office remains the largest.

The choice of Nairobi for UNEP headquarters was applauded for its inclusion of the developing world in UN governance, but it has caused a number of operational difficulties. Because of its distance from most international meetings and secretariats, travel (by UNEP officials to negotiations or by international environmental diplomats to UNEP headquarters) can be costly and time consuming. A report to the General Assembly by the UN Secretary General in 1997 concluded that UNEP personnel spend too much time traveling.¹⁰ The infrastructure available in Nairobi has also at points been unreliable and costly,¹¹ and attracting qualified staff has been made more difficult by concern about security and personal safety.¹²

Governance

For much of its history UNEP was run by a 58-member Governing Council, with regionally designated slots elected in staggered terms. After long-time pressure from the EU and other states to open up membership, and in the wake of the Rio+20 Conference (discussed below), the UN General Assembly voted in 2012 to open the Governing Council to universal participation. At its first meeting in this format, the council decided to rename itself the United Nations Environment Assembly (UNEA) to reflect this new universal representation.¹³

Since 2014 the UNEA has met every two years (though it also had an off-cycle special session in 2022 to commemorate the 50th anniversary of

the founding of UNEP). Each meeting has a theme that frames it; these meetings are followed by a two-day “high level” session (what was once called the Global Ministerial Environment Forum) as an opportunity for government leaders to meet. Like the Governing Council before it, UNEA is the decisionmaking body, passing policy measures relating to UNEP’s activities. The fifth UNEA meeting, for instance, passed a resolution to end plastic pollution and support the international negotiation of a treaty to address the issue (discussed further in Chapter 6).¹⁴ The universal membership UNEA is supported by a ten-member Bureau (one president, eight vice-presidents, and one rapporteur), which is geographically representative, with two members elected from each the five regions. Between UNEA meetings, policy advice and oversight is given by an Open-Ended Committee of Permanent Representatives (CPR), which meets quarterly and also convenes a formal meeting in the years the UNEA doesn’t meet. The CPR is served by a five-member Bureau elected for two years with broad geographical representation.¹⁵

The organization is headed by an Executive Director, the most visible representative of the organization. UNEP’s Executive Directors have been highly visible and bring attention to the organization. The first was Maurice Strong of Canada, who served from 1973 to 1975. He was followed by Mostofa Tolba of Egypt (1976 to 1992), Elizabeth Dowdswell of Canada (1992 to 1998), Klaus Töpfer of Germany (1998 to 2006), Achim Steiner, with both Brazilian and German citizenship (2006–2016), Erik Solheim of Norway (2016 to 2018), and Joyce Msuya of Tanzania (2018 to 2019). The current Executive Director, Inger Anderson of Denmark, has served since 2019.¹⁶ Tolba, especially, became the public face of the organization, and his energy is widely credited with making possible the organization’s successes, especially pertaining to the Rio conference. There is some concern, however, that the importance of the role of Executive Director masks – or perhaps even helps to create – other organizational weaknesses.¹⁷

Box 2.1 UNEP Executive Directors

UNEP EXECUTIVE DIRECTORS:

Maurice Strong (Canada)	1973–1975
Mostafa Tolba (Egypt)	1976–1992
Elizabeth Dowdswell (Canada)	1992–1998
Klaus Töpfer (Germany)	1998–2006
Erik Solheim (Norway)	2006–2018
Joyce Msuya (Tanzania) (acting)	2018–2019
Inger Anderson (Denmark)	2019–present

Financing UNEP

UNEP faced financial difficulties from the start. One of the main implications of being a “program” within the United Nations, rather than a specialized agency, is that it is primarily reliant on voluntary donations rather than required contributions for its funding. The voluntary nature of the funding means that the organization must spend time and effort courting donations. There is always a degree of uncertainty about how much funding will materialize; in the mid-1990s when more than \$100 million promised by donor states was not delivered, the organization faced shortfalls and had to decrease its budget.¹⁸

The organization’s operational budget has grown dramatically, from \$20 million in its first year to \$920.7 million in fiscal year 2020–2021.¹⁹ A small portion of the funding comes from the regular UN budget, but most comes from voluntary contributions from states and other actors to the Environment Fund as well as earmarked contributions for specific programs.²⁰ Since UNEP’s founding at least 181 states have contributed to this fund, with the most significant contributions coming from the United States, Japan, United Kingdom, Japan, and Germany, followed by the Nordic countries, Russia, and the Netherlands.²¹ The amount of these contributions varies considerably however. In 2021, 79 states contributed to this fund, but only 39 of those states met their voluntary “fair share” commitment (discussed below).²²

Much of the organization’s funding is placed in trust funds to address particular environmental issues, and UNEP even asks for targeted donations for specific issues. An extreme example of this approach came in 1998 during the negotiation of the Stockholm Convention on Persistent Organic Pollutants (discussed further in Chapter 6) in which the UNEP office overseeing the negotiation sent a letter to governments, industry leaders, and nongovernmental organizations to ask for donations to allow it to continue the negotiations.²³

The Governing Council became concerned in 2003 that funding had not increased commensurately with the program’s needs and began an effort to increase donations. This effort included creating a “voluntary indicative scale of contributions” in which the organization suggests to states what their contributions should be. In addition to concerns about insufficient funding, UNEP is also criticized for the way its funding is spent. An Internal Oversight review found that the organization spent excessively for advisors and consultants.²⁴

These financial shortcomings have caused problems. Not only have they meant that the organization cannot conduct the activities it believes it should, but also (as the 1997 external assessment of the program noted) that managers and staff have had to focus on how best to cut programs, leaving them “less time to do environmental work.”²⁵ Some go so far as to

suggest that UNEP's lack of a reliable financial base is the primary reason for its lack of influence internationally.²⁶

Monitoring and Scientific Research

UNEP's founding resolution indicates that one of its primary roles is "to keep under review the world environmental situation in order to ensure that emerging environmental problems of wide international significance should receive appropriate and adequate consideration by Governments."²⁷ To that end, one of UNEP's principal activities is the coordination of monitoring and assessment of environmental conditions. It does this review through a number of programs, gathering information on issues relating to water, ecosystems, climate change, toxic substances, land degradation, and other issues in an effort to identify environmental problems and provide information about environmental conditions to policy makers. These programs are coordinated out of the Division of Early Warning and Assessment (DEWA), but much of the information gathering and presentation was reorganized in 2014 into a system called UNEP Live and has since been transformed into what is now called the World Environment Situation Room.²⁸

UNEP's monitoring activities include a Global Resource Information database (GRID) and a network of regional data collection centers, as well as some regionally specific projects to collect environmental information. UNEP also promotes the Global Reporting Initiative, which encourages companies to voluntarily report environmental information; this process involves a set of guidelines for corporate reporting on issues of sustainability. The organization collaborates with the quasi-governmental World Conservation Monitoring Centre to assess biodiversity. In addition, the organization has produced a Global Environmental Outlook (GEO) Yearbook, beginning in 1997, though it is no longer produced every year. These volumes give overviews of environmental trends internationally and are widely available. UNEP also has worked with other UN organizations such as FAO, WMO, and WHO to conduct monitoring on air and water quality.

One of the major difficulties found across UNEP's efforts to coordinate data gathering and analysis has been incompatibilities in methods and processes. Initially after the creation of UNEP there was enthusiasm by governments at all levels "for monitoring virtually everything," but most of these efforts at monitoring did not bear fruit. Some were too vague in their purposes, other entities didn't have the background or training to undertake serious monitoring efforts, and data, once collected, was often not usefully aggregated (or even comparable).²⁹ Even now, data collected for other purposes by individual states or researchers are often either not comparable or not representative. It is in this area that UNEP's

coordination is most sorely needed but occasionally lacking. And ironically, one of the criticisms of the organization is that it does not do sufficient monitoring of its own programs to determine their impact or even their progress. The effort to build different information portals over time suggests that UNEP has not quite solved the information transparency problem.

Regional Seas Program

From the beginning one important negotiating focus of UNEP has been on protecting oceans; to this end, it runs a program on Regional Seas that oversees agreements to protect shared ocean resources by states surrounding largely enclosed seas. The problem of ocean pollution was prominent at the Stockholm Conference, at the behest of Maurice Strong who later became UNEP's first Executive Director.³⁰ The negotiations before Stockholm launched the idea of focusing on individual seas one at a time, rather than working primarily on global initiatives. The Regional Seas program under UNEP began in 1974 and is headquartered in Geneva. The first of the agreements negotiated under its auspices was the Mediterranean Action Plan in 1975 and its related Barcelona Convention and Protocols, and many regions have negotiated similar agreements since then.

Currently there are 146 states involved in programs to protect 14 regional seas. Six of these arrangements are directly overseen by UNEP: those pertaining to the Mediterranean, Caribbean, East Asian Seas, North-West Pacific, Eastern African, North-West Pacific, and Western African regions. The Caspian Sea is overseen by the Regional Office for Europe of UNEP.³¹ An additional seven programs are under the regional seas program but managed by independent secretariats. These are the programs for the Black Sea, the North-East Pacific, The Red Sea and Gulf of Aden, the Kuwait Region (also referred to as the ROPME Sea Area), the South Asian Seas, the South-East Pacific, and the Pacific. There are other regions that have set up programs completely apart from the UNEP process that still participate in the overall global coordinating process on regional seas (that includes international meetings for regional seas programs) run by UNEP. There are another four programs in this category.

The centerpiece of a given regional seas program is its action plan, in which states surrounding a sea agree on the basic process for studying and protecting the affected sea. The next step is (most frequently) the creation of an international agreement (Convention) on the general protection of the area that functions in conjunction with protocols that contain the specific measures states need to take in order to protect the sea. The protocols attempt to address the wide variety of sources of pollution, including land-based pollution, responsible for most ocean pollution but has been too frequently ignored in efforts to address ocean quality. The general

approach that was developed in the earlier regional seas agreements has been used in subsequent ones, avoiding the need to begin negotiations from scratch. Also central to the entire process is monitoring, undertaken primarily by the surrounding states themselves, and information exchange.

Box 2.2 Regional Seas Agreements

Administered by UNEP

Caribbean Region
East Asian Seas
Eastern African Region
Mediterranean Region
North-West Pacific Region
Western African Region

Administered by UNEP Regional Office for Europe

Caspian Sea Region

UNEP-Affiliated

Black Sea Region
North-East Pacific Region
Pacific Region
Red Sea and Gulf of Aden
ROPME Sea Area
South Asian Seas
South-East Pacific Region

Independent

Arctic Region
Antarctic Region
Baltic Sea
North-East Atlantic Region

Source: <https://www.unep.org/explore-topics/oceans-seas/what-we-do/regional-seas-programme>

The first, and highest profile, effort in the regional seas program was the Mediterranean Action Plan (MAP), agreed to in 1975.³² The MAP called for joint monitoring and research of ocean conditions, a program

to integrate issues of development with the need for environmental protection, and a set of legally binding agreements limiting polluting activities by states. All the states in the region (except Albania, which has since joined) met the following year to negotiate the Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution and two protocols – one to prohibit dumping of hazardous substances, the other on addressing emergencies that result from unintentional discharges into the sea. Five additional protocols were negotiated in the following years on conservation, pollution from land-based sources, hazardous wastes, offshore exploration and exploitation, and integrated coastal zone monitoring.³³ States ratifying the Convention must simultaneously adopt at least one of the Protocols (and all parties to the Protocols must also be parties to the Convention).³⁴ The entire Convention and Protocol structure was renegotiated in 1995 to try to streamline it and incorporate principles of sustainable development³⁵ while keeping essentially the same substantive obligations. Although it is under the UNEP Regional Seas program, the Mediterranean Action Plan and associated agreements has its own secretariat, with UNEP personnel, located in Athens.

The Mediterranean is both deep and small, relatively enclosed geographically but with a densely populated coastline. These characteristics, along with specific activities (such as irrigation) by surrounding states led to a high degree of pollution. The efforts by UNEP to gather a set of scientists and begin the process of research to better understand the condition of the sea was central to the process of cooperation to protect it. The idea was that international cooperation would deepen as the problems were better understood. At least initially this process worked: new protocols were negotiated to address problems that were more fully understood. And there have clearly been positive impacts from these agreements: states in the region have built sewage treatment plants, established marine protected areas, and taken steps to decrease the dumping of waste into the sea. In 2008, a non-adversarial compliance committee was created with the goal of helping states implement the convention and its protocols. But lack of funding from UNEP has hampered cooperation, and monitoring has been weak. While it is likely that the condition of the sea has at least not worsened – itself an accomplishment in an area with a growing population and increasing industrial activity – assessment is difficult,³⁶ and it is not clear that it has improved as much as the negotiated agreements intended.

The regional seas program overall was, at least initially, considered to be a great success. The organization itself refers to the program as the “most important regional mechanism for the conservation of the marine and coastal environment.”³⁷ It required coordination among many UN organizations and thus represented precisely the kind of organizational and catalytic role UNEP was designed to take on.³⁸ The individual programs have indeed achieved some degree of success in terms of widespread participation and awareness.

Politically, the level of cooperation within the individual agreements has been impressive. Many of the regional seas surround states that have hostile relationships with each other (Israel, Libya, and Egypt together in the Mediterranean agreements; the United States and Cuba together in the Caribbean Region agreements) that nevertheless work together in this context. In most agreements most of the relevant states are members. Many of these agreements also involve states with radically different levels of development and they have been able to agree on basic principles of environmental protection.

But the regional seas program has also run into both institutional and environmental difficulties. As has come to be common within UNEP, financing has been a perennial problem. The funding for the individual agreements as well as for the overall program is voluntary. The promised funding has been uneven, with some states shouldering most of the responsibility, and promised funding coming in late. The lateness of promised funding left the Mediterranean Action Plan almost broke at points in the 1980s.³⁹ Similarly, the trust fund for the Kuwait Region (ROPME Sea) program had a \$2 million shortfall in promised funding in early 1981.⁴⁰

Monitoring, the central element of coordination, has also been problematic. An early evaluation of the regional seas program found that many national monitoring and research capacities do not meet the scientific standards UNEP requires. Many of the facilities provided by states are inadequate, and data reports are late and incomplete. States do not submit information they are required to, or fail to do so in a timely manner. Different UN agencies have not fully supported the program, and have not made use of regional seas-generated data, preferring to use other sources of data.⁴¹

More importantly, it is difficult to point to solid evidence of improvement in the environmental condition of many of the seas in the program. In some cases this lack of evidence may be due to missing data, but in other cases it appears that environmental conditions have not necessarily improved. A 1990 study commissioned by UNEP commented that, other than in the Mediterranean, none of the programs “has had much success in combating pollution.”⁴² A 2020 UNEP report found “gaps in implementation and enforcement.”⁴³ It is important to consider the counterfactual, however: even in places where the environmental conditions may not have improved, it is possible that they have deteriorated less quickly than they would have without the programs. This result does not match the optimism with which the program began, but may accurately reflect the useful but not dramatic work that UNEP has been able to do in this area.

Ultimately, the problems faced by the regional seas programs are similar to those experienced by other global environmental institutions: the difficulty of trading short-term sacrifice for long-term gain, especially when the longer-term advantages depend on continued cooperation by all relevant states. And, to be fair, the problems addressed in these plans are

difficult, and they often involve collaboration among states with widely differing levels of development and sometimes-contentious political relationships. Nevertheless, it is hard to regard the regional seas programs as the significant achievement that UNEP believes them to be.

Overseeing International Agreements

One of the other central roles of UNEP has been its role in the process of negotiating international environmental agreements, calling for and coordinating international negotiations on a range of issues. This role of UNEP is discussed in this volume in the context of the specific agreements it has played a role in negotiating. Once the agreements are operational, however, UNEP also takes responsibility for overseeing their daily operations, providing secretariat functions for many international environmental agreements. These secretariats are located around the globe.

Box 2.3 UNEP Secretariat Services

Global Organizations/Treaties:

- Convention on Biological Diversity (CBD)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- Convention on the Conservation of Migratory Species of Wild Animals (CMS) and associated agreements
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Convention)
- Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC)
- Stockholm Convention on Persistent Organic Pollutants (POPS)
- Vienna Convention for the Protection of the Ozone Layer & Montreal Protocol on Substances that Deplete the Ozone Layer (Ozone Convention & Protocol) and Multilateral Fund for the Implementation of the Montreal Protocol
- United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa
- Minamata Convention on Mercury

Regional Organizations/Treaties:

- Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa (Bamako Convention)
- Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention)

Regional Seas Treaties:

- Convention for Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West, Central and Southern African Region (Abidjan Convention)
- Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention)
- Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)
- Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Western Indian Ocean (Nairobi Convention)
- Framework Convention for the Protection of the Marine Environment of the Caspian Sea (Tehran Convention)

Compiled with information from: <https://www.unep.org/about-un-environment/why-does-un-environment-matter/secretariats-and-conventions>

It is not always clear what it means to have UNEP as the secretariat: in practical terms, the people working in a given office spend all their time working on the treaty organization they are connected to, rather than working for UNEP in any broader sense. Nevertheless, this connection both means that UNEP bears some funding responsibility for the secretariat offices and, ideally, allows communication across issues and treaty organizations since ultimately they are all coordinated by UNEP.

UNEP's Difficulties and Successes

Criticisms of UNEP abound. Its role is a bit haphazard. It is not the only source of assessment and monitoring, it is only one source of many for funding, coordination, and secretariat services, and – though this is not

unique to UNEP – some of the negotiations it has overseen have produced weak measures.

Some of these difficulties are structural. UNEP was created with a small staff and budget compared to most UN agencies.⁴⁴ The vast number and scope of international environmental agreements, many of which are discussed in the rest of this volume, make UNEP's coordinating role particularly difficult. Each of these agreements has its own conference of the parties, which acts as the primary decision-making body. Though UNEP provides secretariat services for some (which thus gives it a more central involvement than it would otherwise have in these issues), they each operate independently.

In other ways, UNEP has been a victim of its own success. Since the early 1970s the number and variety of environmental issues addressed on the international level has grown dramatically, due at least in part to UNEP's role in gathering and dissemination information about environmental problems, raising awareness, and galvanizing action. But the result is a set of environmental institutions that are too numerous and varied for UNEP to be able to control. As David Downie and Marc Levy point out, this degree of success has increased the need for UNEP to be able to coordinate.⁴⁵ As will be seen in the following chapters, various issue areas have multiple distinct agreements and organizations governing state activities, and the level of coordination is often not what it could be. Other UN-related processes in recent decades, such as the World Commission on Environment and Development in 1987 and UNCED in 1992, have called for a strengthening of UNEP's role. An external review of UNEP in 2013 by ECOSOC praised its information-generating and disseminating accomplishments and its role in the development of global environmental norms. At the same time, the review noted the problems that came from overlapping roles and mandates.⁴⁶ The creation of a joint Basel-Rotterdam-Stockholm secretariat (discussed in Chapter 7) to oversee the Basel, Rotterdam, and Stockholm Conventions is one step in responding to this type of criticism.

Other successes of the organization should not be overlooked, however.⁴⁷ It truly has acted as a catalyst for the negotiation of important international environmental agreements. It is essential to remember that there is only so much that structure can accomplish if the political will to implement strong international environmental management is absent. Many of the shortcomings attributed to UNEP should be more accurately ascribed to the unwillingness of states to undertake stronger environmental action.

United Nations Environment Conferences

One of the ways that the United Nations has worked toward the development of international institutions for the protection of the global environment has been by holding major international conferences to discuss

emerging environmental issues. These conferences themselves create no new institutional structures or binding law, though they often result in resolutions and action plans that lead to the eventual creation of institutional structures to oversee them. They also provide a timing peg around which new international agreements may be negotiated so that they can be signed at the conferences themselves, or provide the impetus for future negotiation of international agreements. There is widely differing opinion on the usefulness of these conferences, with some scholars arguing that they are essential to the international governance of the environment and others suggesting that they deflect energy and attention from other important efforts.

The major conferences on environmental issues began in Stockholm in 1972; later dates for conferences were chosen to occur in 10-year intervals from this first conference. But these were not the first or only efforts of the United Nations to address environmental issues through global conferences. As early as 1949, ECOSOC convened the United Nations Scientific Conference on Conservation and Utilization of Natural Resources. This conference was attended by representatives of 49 states and eight international organizations. Its function was more the exchange of information between experts and those in government responsible for managing resources than the creation of any international consensus.⁴⁸

Other early UN-sponsored conferences with environmental implications include the Symposium on Patterns of Resource Use, Environment and Development Strategies sponsored by UNEP and held in Cocoyoc, Mexico, in October 1974. The Cocoyoc Declaration from the conference emphasized the need to improve the economic and social system for the poorest states without relying on market mechanisms. Environmentally it focused on the implications of unequal levels of north-south development as a cause of environmental degradation and pointed to poverty as a cause of environmentally destructive behavior.⁴⁹ A set of population conferences, most notably the International Conference on Population and Development held in Cairo in 1994, also addressed aspects of environmental protection. The plan of action from the conference acknowledges that "meeting the basic human needs of growing populations is dependent on a healthy environment."⁵⁰ A 1995 World Summit on Social Development in Copenhagen focused on human needs, including the importance of protecting "the integrity and sustainable use of our environment."⁵¹

United Nations Conference on the Human Environment

The first UN conference entirely focused on environmental issues was the United Nations Conference on the Human Environment (UNCHE), which was held in Stockholm, Sweden, from June 5–16, 1972. Sweden first suggested to ECOSOC in 1968 the idea of having a UN conference to focus on human interactions with the environment. ECOSOC supported

the idea with resolution 1346. General Assembly Resolution 2398 in 1969 decided to convene a conference in 1972 and mandated a set of reports from the UN Secretary General to focus the scope of the conference. The Secretary General suggested that the conference focus on “stimulating and providing guidelines for action by national governments and international organizations” facing environmental issues.

Maurice Strong, the head of the Canadian International Development Agency, was appointed Secretary General of the Conference. He commissioned Barbara Ward and René Dubois to write a document that would provide the intellectual framework for the conference; their work, *Only One Earth*, argued in favor of an international responsibility for studying the relationships between humans and the natural environment and called for a shared “loyalty to the earth” and policy, coordinated internationally, to address global environmental issues.⁵² More than 80 individual states submitted national reports on their environments as well as reports on particular environmental problems. The process of gathering and submitting this information gave some states the first overview of the conditions of their domestic environments.

The General Assembly created a preparatory committee composed of representatives from 27 states to advise the Secretary General on the preparation of the conference. This committee held four preparatory meetings between 1970 and 1972. These meetings discussed the issues to be examined in the conference and drafted the declaration and action plan. Among other issues, these meetings addressed the concerns of developing countries that protection of the environment would interfere with their ability to develop and that since existing environmental problems were primarily caused by industrialized countries, the costs of addressing them should be borne by these states as well. They also emphasized their sovereign rights over natural resources and their determination to make their own environmental policies.

The concerns of developing countries were most directly addressed in a meeting by 27 experts convened in the village of Founex in Switzerland in 1971. This meeting produced the Founex Report on Development and Environment and elaborated the concerns of developing countries with respect to environment and development. These concerns helped to broaden the agenda of the conference to bring in issues of poverty in addition to issues of industrialization.⁵³ They also set the stage for later conferences to focus more directly on the link between environment and development.

States from most parts of the world – 113 in all – sent representatives to the Stockholm conference. The one notable exception was Soviet bloc states, most of which boycotted the conference in protest of the voting status of East Germany in the conference. Though these states participated in most of the preparatory meetings, a UN General Assembly

decision in 1971 at the behest of states from the West (most notably the United States) required that participation in the Conference would only be open to states that were members of the United Nations or its specialized agencies, which excluded East Germany.⁵⁴ Maurice Strong, however, communicated consistently during the conference with Soviet representatives and brought their perspectives into the debates at the conference despite their absence from the meetings.⁵⁵

Nongovernmental organizations were invited as well, to a UN-sanctioned Forum for NGOs that was held outside the official negotiations. Though NGOs voiced concerns about their separation from the governmental negotiating process, the Stockholm conference is credited with beginning the trend of recognizing the importance of NGOs and creating access for them at official conferences.

The official products of the conference consisted of the Declaration of the United Nations Conference on the Human Environment (generally referred to as the Stockholm Declaration) and an Action Plan for the Human Environment. The conference also passed several resolutions. The most important of these was the Resolution on Institutional and Financial Arrangements, which recommended the creation of several pieces of UN environmental machinery to oversee a continuing process within the United Nations of addressing environmental issues. Other resolutions from the conference recommended the creation of a second conference on the human environment (to be coordinated by the new UN environmental processes set up), called for the creation of a World Environment Day, and condemned nuclear weapons tests.

As a direct response to these resolutions, the General Assembly created UNEP. Other international agreements reached in the 1970s had their roots in the Stockholm conference, most notably the Convention on Long-Range Transboundary Air Pollution (see Chapter 5), the Convention Concerning the Protection of World Cultural and Natural Heritage (see Chapter 3), the Convention on International Trade in Endangered Species (see Chapter 3) and a number of the international maritime pollution agreements (see Chapter 4).

The conference is credited with bringing international attention to environmental issues, which previously had been addressed in uncoordinated and mostly local efforts. In particular it clarified important conflicts between rich and poor countries over how to consider the relationship between environment and development. It also helped to codify international legal principles that had been developing in international law but had not been elaborated in a specifically environmental context. And it prompted states to undertake action domestically on environmental issues.

Ten years after the Stockholm Conference, UNEP held a special Governing Council session in Nairobi to evaluate the impacts of the conference. This session, open to all UN members, is sometimes referred to as

Stockholm+10. It was attended by representatives of 134 states. Reports commissioned for the meeting indicated that implementation of Stockholm goals were mixed, noting in particular the difficulty of people in developing countries to meet their basic needs and the increase in various forms of environmental degradation.⁵⁶ The declaration from this session, referred to as the Nairobi Declaration, reaffirmed support for the Stockholm declaration and the Action Plan for the Human Environment and called for the strengthening of UNEP. Most importantly, however, it expressed “serious concern about the present state of the environment worldwide” and called for an intensification of efforts to improve it.⁵⁷

United Nations Conference on Environment and Development

After UNEP's creation, it took on the role of coordinating high-profile international conferences for the United Nations. The most prominent of these was the United Nations Conference on Environment and Development (also called the Earth Summit), held from 3–14 June 1992, in Rio de Janeiro. The timing of the conference was chosen to be the 20th anniversary of the Stockholm conference that had led to UNEP's founding. The focus of the Rio conference was the relationship between environment and development, motivated in part by the 1987 publication of *Our Common Future*, the report of the United Nations Commission on Environment and Development. The Secretary-General of the Conference was Maurice Strong, former UNEP Executive Director (and Secretary-General of the Stockholm Conference).

The idea of a second major United Nations conference on environmental issues was first brought up in the UN General Assembly in 1986, with the ending of the Brundtland Commission, discussed below. A resolution in December 1989 officially called for a conference to “elaborate strategies and measures to halt and reverse the effects of environmental degradation” in the context of “sustainable and environmentally sound development in all countries.”⁵⁸

The negotiation process was contentious. The UN held four preparatory committee meetings between March 1990 and April 1992, and much remained undecided at the final meeting. The negotiations revealed the depth of the north-south divide on issues of environment and development. Developing countries were concerned that international environmental regulations would impact their ability to develop. They wanted acknowledgement that most of the damage to the global environment had been done by the developed countries and assurance that they would not be prevented from developing, using the same technology their predecessors had. They pushed for new development assistance, as well as technology transfer, and influence in determining how it would be allocated, no

linking of trade to environmental behavior in developing states, and the idea that developed states must act first on environmental protection.

Developed states, on the other hand, wanted acknowledgement of the role of population growth in environmental degradation and an equal allocation of responsibility for addressing environmental problems. Some, led by the United States, argued against creating new aid obligations, suggesting that using resources more efficiently and bringing in the resources of industry would be sufficient.⁵⁹ There were disagreements among developed states as well. The United States played largely a limiting role, trying to prevent the creation of specific new obligations. The Nordic countries generally supported the concerns of developing states, and Japan and the European Union fell somewhere in the middle.

The conference was considered at that point to be the largest gathering of world leaders anywhere. Representatives (often heads of state) of 178 states attended, along with representatives from agencies of the United Nations and other international organizations. The conference featured a parallel "Global Forum" for NGOs. Approximately 1500 NGOs were accredited to the conference, and another 800 sent individuals to the conference. The forum allowed the NGOs and individuals to exchange information, plan strategies, and build alliances. While some were pleased with the opportunity to meet with so many activists from around the world, others were unhappy that this event was kept separate from the official meeting.

Two international agreements, the Convention on Biological Diversity (discussed further in Chapter 3) and the Framework Convention on Climate Change (addressed in Chapter 5), were negotiated separately from the UNCED preparation process but specifically timed so that they could be signed in Rio. Efforts were made to negotiate a global treaty on forests as well, but states could not reach agreement; the result was a Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation, and Sustainable Development of All Types of Forests.

The conference produced two other nonbinding statements. The Rio Declaration on Environment and Development elaborated 27 principles that states should use in integrating environment and development. These include a reiteration of the right of states to sovereignty over their natural resources, support of the precautionary principle and polluter pays principle, and broad principles pertaining to participation in decision making on issues relating to environment and development. The second statement, Agenda 21, is a much longer document intended to serve as an action plan for the implementation of the principles and goals of the conference. In each of its 40 chapters it suggests ways to prioritize the issues discussed and estimates the costs of addressing them.

Reactions to Rio were mixed. UNCED is credited with bringing new attention internationally to issues of environment and development. Though efforts to negotiate a forest convention failed (and have continually failed since Rio), negotiating two binding conventions on difficult issues in the context of an international conference is acknowledged as an impressive accomplishment. The conference gave an international voice to thousands of nongovernmental organizations and gave these organizations new avenues for cooperation. It also created a number of new institutions. These included institutions created within the climate change and biodiversity conventions, the Business Council on Sustainable Development (which later added "World" to the beginning of its name), and the Commission on Sustainable Development (see below, also eventually renamed and reconstituted), created after the conference to oversee implementation of its decisions.

It also receives much criticism. The profound disagreement between developed and developing states led to weak language in the Rio declaration and *Agenda 21* that satisfied neither bloc. Even those weakened commitments (such as a reaffirmation by developed states to the goal of providing 0.7% of their GNP in development assistance) have gone largely unfulfilled. And though the involvement of NGOs was extensive, those from the developed world were much more prominent than those from developing countries, and critics decried the northern dominance within the NGO process.

Most fundamentally, Rio is criticized as the pinnacle of what Steven Bernstein calls "the compromise of liberal environmentalism."⁶⁰ The declarations and agreements at UNCED largely reflect the dominance of the liberal international economic order in pointing toward a compatibility of economic growth and environmental protection in the context of a market economy. Those who believe that true environmental protection requires a fundamental shift from business as usual decry the extent to which the Rio conference fully institutionalized the shift from seeing industry and wealth as the cause of environmental degradation to viewing them as the solution to environmental problems.⁶¹ Whatever one believes about this relationship, the conference at Rio helped to cement an international policymaking process in which industry and economic growth are central to the way environmental protection is negotiated.

Several follow-up meetings have been held as well; the first, five years after Rio (often called the Earth Summit+5), was a special session of the General Assembly to evaluate the implementation of its obligations and goals, held in New York in June 1997. Though the two binding agreements had entered into force by this point, this session indicated that progress on many of the Rio goals was sorely lacking. Negotiators had also hoped to be able to complete a forest treaty in time for this special session but were not able to. Preparations for this meeting involved the presentation of

reports on state action and specific environmental problems, many of them emphasizing the distance between Agenda 21's goals and its implementation. A General Assembly resolution reaffirmed the commitment of states to the implementation of Agenda 21.⁶²

World Summit on Sustainable Development

UNEP also coordinated the World Summit on Sustainable Development as a follow-up ten years after UNCED. It took place between 26 August and 4 September 2002, in Johannesburg, South Africa. It was attended by representatives of 191 states (including 104 heads of state). As has become the norm, there was also a parallel NGO forum with more than 40,000 participants,⁶³ more than 21,000 accredited to the conference itself. The World Business Council on Sustainable Development held a business forum during the conference, showcasing environmental actions.

The preparations for the conference were much less focused than those for preceding UN environment conferences. The General Assembly resolution establishing the meeting called for a summit "to reinvigorate the global commitment to sustainable development,"⁶⁴ but did not provide specific guidance on the agenda though it listed a set of issues for consideration that were both broad and vague. The Commission on Sustainable Development (see below) was responsible for organizing the preparation, but moved slowly during the preparatory meetings, with little resolved until shortly before the actual conference.

In the negotiations before the conference there were disagreements on whether to seek new obligations. Most agreed that the main shortcomings on issues of sustainable development were that existing agreements and goals from the 1992 Rio Conference had not been sufficiently implemented. Even then, much discussion took place before the meeting about whether to seek specific commitments for implementation and funding. The General Assembly resolution creating the summit had called for "specific time bound measures to be taken and institutional and financial requirements,"⁶⁵ but the United States and others strongly resisted specific new commitments.

The Summit produced a weak Johannesburg Declaration on Sustainable Development that adds little to the declaration from Rio. The conference also produced a Plan of Implementation of the WSSD. Even the modest goals in this document were controversial and few issues had been resolved before the conference began.

The conference focused thematically on water and sanitation, energy, health, agriculture, and biodiversity. On water, the Plan of Implementation identifies the goal of reducing the number of people without access to sanitation by 50% by 2015. Individual states also pledged more than a billion dollars in investments and loans for projects on water and sanitation.

On energy, states made vague commitments to phase out energy subsidies “where appropriate” and to increase energy efficiency, use of renewable energy, and access to modern energy services. Health results included the commitment that by 2020 chemicals should be used and produced in ways to avoid damage to the environment and to human health; states also agreed in principle to cooperate to reduce air pollution and to improve developing states’ access to substitutes for ozone-depleting substances. Discussions on agriculture included the agreement by the Global Environment Facility (discussed further in Chapter 7) to consider including funding for the Convention to Combat Desertification in its funding areas. The Plan of Implementation noted vague commitments to protect biodiversity: to reduce biodiversity loss by 2010, to reverse trends in degradation of natural resources, to restore fisheries and create marine protected areas.⁶⁶ Many of these points reflected commitments already made in the context of the UN Millennium Development Goals (see below).

The Summit made an effort to integrate private industry into the governance of environmental issues. One approach is what came to be known as “Type II agreements” – a set of public-private partnerships for sustainable development involving national governments, civil society, and business actors. The UN notes 220 partnerships (involving a commitment of \$235 million) reached before the summit and an additional 60 announced during the event.⁶⁷ These ranged from a gas exploration project in the Philippines to an agreement among Brazil, the GEF, the World Bank, and the World Wide Fund for Nature (WWF) to create a regional protected area in the Amazon. Many observers were concerned, however, that these types of initiatives had no clear guidelines or oversight, channeled pressure for action away from official government commitments, and had no clearly stated rationale.⁶⁸

The United States was singled out for disapproval at the meeting. Not only did US President George W. Bush decline to attend, but the United States was the primary opponent of strong and specific obligations for states from the conference. The negotiators from the United States weakened or blocked most proposals.⁶⁹

Most observers were not impressed with the Johannesburg Summit. James Gustave Speth called it “a huge missed opportunity.”⁷⁰ The Vice President of Palau pointed to the “failure of key nations to recommit to the goals of the Rio Earth Summit.”⁷¹ The Executive Director of Oxfam Community Aid referred to the outcomes of the conference as “a number of major defeats.”⁷² The weaknesses of the conference certainly reflect the lack of international pressure for strong action. An anonymous UN officer suggested that the popular mood was not focused on deep environmental commitments: “If we had negotiated Rio at Johannesburg we would have gotten half of what we got ten years ago.”⁷³ Those whose primary concerns were development were happier with the outcome of

the conference than those whose focus was environmental action. The conference has nevertheless been praised for fully integrating economic issues, environmental issues, and social issues on an equal footing⁷⁴ and for generating experimentation and innovation in governance processes.⁷⁵

Rio+20

A second follow-up UN Conference on Sustainable Development, 20 years after the Rio conference, took place in Brazil from 13–22 June 2012, bringing together 44,000 participants. Its two primary themes were building a green economy (including support for developing countries) and improving international coordination for sustainable development. Representatives from 191 UN member states, including 79 heads of state, attended, though the leaders of the United States, Britain, and Germany were notably absent. The governments attending unanimously approved the nonbinding central conference document, *The Future We Want*, which ended up as a fairly bland compromise document with few specific proposals for advancing sustainable development.⁷⁶ Steven Bernstein characterized the underlying themes of the conference as “integration, implementation, and coherence.” Rather than an effort to transform the governance of sustainable development, states simply hoped to make the process work a bit more smoothly.⁷⁷

Several outcomes from the conference did make a difference in environmental governance, including the recommendation to make the UNEP Governing Council into a universal membership organization. The conference also led to the creation of the High Level Political Forum on Sustainable Development and supported the development of Sustainable Development Goals to replace the Millennium Development Goals, both discussed further below. And the conference process encouraged attendees from governments, civil society, and industry to make voluntary commitments of actions to implement the conference’s goals, with nearly 700 such pledges collected before the end of the conference. Ultimately, though, the results from the conference were even more modest than many had hoped for.⁷⁸

UN Commissions

World Commission on Environment and Development

As the 10th anniversary of the Stockholm conference in 1982 neared, UNEP prepared to examine environmental approaches looking toward the year 2000. It recommended the creation of an independent commission made up of distinguished individuals to raise awareness of and frame these issues. Prompted by the pessimistic assessment ten years after the

Stockholm Conference, the United Nations General Assembly accepted this recommendation and called for the creation of a commission to address the intersection of issues of environment and development.⁷⁹ Its mandate was to suggest long-term strategies for sustainable development, propose mechanisms for bringing developing countries into international environmental cooperation and increasing environmental cooperation between developed and developing states, and to examine ways to foster effective international environmental action.⁸⁰ Gro Harlem Brundtland, the former (and future) Prime Minister of Norway, was appointed by the UN Secretary General to chair the commission with Mansour Khalid, the former Minister of Foreign Affairs of Sudan, as co-chair. These two appointed the 21 remaining members, all serving as individuals rather than as representatives of their states. Established in 1983, the Commission (often referred to as the Brundtland Commission) met from 1984 to 1986, held public meetings in regions across the globe, and consulted with individuals, scientists, nongovernmental organizations, and representatives of industry. The commission also appointed a set of special advisors on particular issues.

The primary output of this process was the report *Our Common Future*, published in 1987. This volume gave an overview of the difficulties facing the common and intersecting desires for economic development and environmental protection. It identified as specific challenges the issues of population and food security, the protection of species and ecosystems, and energy, industry, and urban issues. It also proposed specific legal principles and institutional structures extending existing principles. Most prominent of these are the idea of intergenerational equity, the necessity for states to conduct environmental assessments and to notify affected individuals before undertaking activities that might impact the environment, the need to limit risk and accept liability and the idea that states share “common but differentiated responsibilities” in protecting the environment.⁸¹ Though it did not coin the term, the WCED is responsible for popularizing the concept of sustainable development and defining it in its most often used formulation: development that meets “the needs of the present without compromising the ability of future generations to meet their own needs.”⁸²

Commission on Sustainable Development

Agenda 21 at the Earth Summit called for the creation of a Commission on Sustainable Development (CSD) to ensure that the decisions from the conference were fully implemented. The 47th Session of the UN General Assembly in December 1992 created the organization and its composition, terms of reference, and guidelines.⁸³ The organization was charged with ensuring the effectiveness of UNCED by monitoring and reporting

on implementation of the agreements from the conference and to facilitate dialogue among all the groups identified in Agenda 21 as important nongovernmental actors. After the World Summit on Sustainable Development the CSD also took on responsibility for monitoring the execution of the Johannesburg Plan of Implementation.

At the same time the CSD was created, the UN undertook a major structural reform to give it oversight, creating the Division for Sustainable Development to serve as the secretariat for CSD and related activities. The CSD reported to ECOSOC in the UN hierarchy, which required CSD decisions to be approved by ECOSOC before they were presented to the General Assembly for action. Fifty-three states were elected as members of the CSD by ECOSOC with regional representation. The CSD requested the submission of national reports to fulfill its monitoring role. This gathering of information was controversial, with developing states insistent that reporting should be voluntary and that comparison should not be made across states. As a result the organization issued guidelines for reporting but no requirements, and comparisons across reports made with differing frequency and formats is difficult.⁸⁴

It is difficult to determine what the influence of this institution was. It was not charged with creating any new obligations for states and had no legal authority to compel states to act. Its primary impact was in the generation of information, the creation of norms, and the development of capacity. One set of scholars described it as “long on dialogue and speech-making but short on stimulating action.”⁸⁵ The importance of its dialogue should not be entirely dismissed, however: it can play an important role in bringing non-state actors into the otherwise largely intergovernmental focus within the United Nations, and increases access by these actors in UN discussions and negotiations.⁸⁶

Some argue that the CSD increased concern about sustainable development internationally, though of course such an effect is difficult to measure. It perhaps succeeded in helping governments to make links across the many issues it considered under its mandate, and it gave focus to NGO activities locally, nationally, and internationally.⁸⁷ But on the whole it did not have a major impact at placing concern about sustainable development onto the agenda of states or international organizations not already interested in discussing it. Its weaknesses suggest that it was created as a way to avoid, rather than institutionalize, action.

High-Level Political Forum for Sustainable Development

The Rio+20 meeting agreed to replace the Commission on Sustainable Development with a High-Level Political Forum for Sustainable Development (HLPF). Negotiations prior to the conference debated the possibility of creating an autonomous council, but opposition from powerful

developed and developing states alike scuttled that idea. Negotiations for what format the new entity would take continued after the conference concluded and the resulting institution is a hybrid. It is an interstate forum with universal membership that meets under the auspices of the General Assembly every four years at the head-of-state level and under the auspices of ECOSOC, at the ministerial level, annually, though – unlike the CSD – it is not subsidiary to ECOSOC. As a forum, rather than a commission, it lacks a secretariat or an autonomous bureau,⁸⁸ but the involvement of ministers and heads of state gives it, at least in theory, the potential for influence.⁸⁹ Its first meeting was in 2013, and its most important action thus far has been to adopt the newly created Sustainable Development Goals.

Goals

Millennium Development Goals

The UN in 2000 adopted a set of aspirations called the Millennium Development Goals. These nonbinding goals refer to eight accomplishments to aim for by 2015. They include reducing by 50% the proportion of people who have an income of less than \$1 per day, suffer from hunger, and do not have access to safe drinking water or sanitation, as well as working to promote gender equality, reduce child mortality, and improve maternal health. One goal specifies the need to “ensure environmental sustainability.”⁹⁰

What was the result of the MDGs? None of these goals were entirely met, but lack of completion should not be surprising: they were ambitious (and occasionally vague) goals in a complex world. Progress was made toward all of them, though the extent of that progress varied. Extreme poverty has declined significantly worldwide, primary education enrollment has improved (including, importantly, among girls), mortality rates of those under five declined by 45% and maternal mortality rates were cut nearly in half, new HIV infections declined by more than 40%, and official development assistance increased by more than 66%. Within sustainability goals, many countries met the drinking water and sanitation goals, with 1.9 billion people gaining access to piped drinking water.⁹¹ A variety of other environmental improvements, as detailed throughout this volume, have transpired. Even if many aspects of the goals were not fully realized – and the poorest countries were the least likely to meet the targets – this is progress, indeed.

The bigger question was how influential these goals (and the processes they represented) were in leading to those changes. Evidence there is mixed. The intent of specifying concrete goals in specific areas was to mobilize both attention and effort. This attention followed, and new sources of funding were contributed in the effort to meet the goals.⁹²

Because they had been declared to be MDGs, regular and transparent review of efforts was conducted in a way that kept these issues in the spotlight. On the other hand, the MDGs represent priorities that the UN system and individual states have been working on for decades; some progress would undoubtedly have continued to be made even in the absence of the MDG focus.

At worst, some scholars argue that the goals were poorly chosen and that they diverted attention from other, perhaps more important, development efforts. Things that could be measured (like numbers of students enrolled) crowded out things that couldn't (like quality of education), and things that were easier to accomplish (vaccinations against measles, for instance) were chosen as indicators even when they didn't account for major health risks.⁹³ That these goals were followed by another set of goals, taking a similar approach, suggests that the UN system and participating states found some value in pursuing them.

Sustainable Development Goals

The successor to the MDGs are the Sustainable Development Goals (SDGs). These were developed and formally adopted in the UN General Assembly in September 2015. They became effective 1 January 2016, and focus on the time period between then and 2030. There are 17 goals (with 169 targets and a larger number of indicators). They present a framework for action across all countries (unlike the MDGs, which focused primarily on conditions in developing countries), and include some strictly environmental goals that were not present in the MDGs. The goals are general, and the targets specific. For instance, a general goal (#14) to "conserve and sustainably use the oceans, seas and marine resources" is accompanied with somewhat more specific targets that include things like conserving 10% of marine areas by 2020, eliminating certain forms of fishing subsidies by 2020, and (a bit less specifically) "prevent and significantly reduce marine pollution of all kinds" by 2025.⁹⁴

Box 2.4 Sustainable Development Goals

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
3. Ensure healthy lives and promote well-being for all at all ages
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

5. Achieve gender equality and empower all women and girls
6. Ensure availability and sustainable management of water and sanitation for all
7. Ensure access to affordable, reliable, sustainable, and modern energy for all
8. Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation
10. Reduce inequality within and among countries
11. Make cities and human settlements inclusive, safe, resilient, and sustainable
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts
14. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development
15. Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

Compiled with information from: <https://sdgs.un.org/goals>

Within the context of the HLPF, the goals are now reviewed annually in Sustainable Development Goals Reports. These report on progress toward, and challenges of, implementing the SDGs. The 2022 report, for example, focused on the difficulties the COVID-19 pandemic created in working toward the SDGs.⁹⁵ In addition, the organization has held summits, the first in 2019 and the second in 2023, with the explicit goal of increasing the political will toward achieving the SDGs. The goals have been criticized for not being sufficiently ambitious or including contradictory objectives, but there is evidence that they are being taken up in ways similar to the MDGs, and, for better or worse, may expect a similar level of achievement. Ultimately, the resources and the political will to implement them will come from the UN member states, so their success or failure rests on that level of commitment.

Conclusions

The United Nations environmental machinery has grown dramatically in the last several decades. It now consists of a program, a forum, and a large number of activities and goals within the organization. UNEP itself is a multifaceted institution with a hand in running many of the treaty organizations discussed in the following chapters, most of these under separate organizational structures. The number and extent of specifically UN-based institutional structures to focus on the environment is both a strength and a weakness of the system. On the positive side, the continuing integration of environmental concerns into increasing numbers of UN organs and agencies is an accurate reflection of the pervasiveness of environmental problems and their central connection to issues such as development and human rights.

On the other hand, the organic growth of these structures leads to duplication of effort and confusion about mandate. The simultaneous existence of both UNEP and the (now former) CSD, for instance, led to confusion about their relationship,⁹⁶ and the same is likely true with the universal membership UNEA and the High-Level Political Forum on Sustainable Development. Multiple sources for the collection of data mean that effort is duplicated and sometimes information collected for one purpose is not available or not appropriate for other uses. And since funding for most environmental issues is both scarce and voluntary, many of the UN initiatives have run into funding problems that have only increased as there have been more UN-based activities competing for funding.

Ultimately the activities within the UN environmental machinery should be seen as the background that enables or supports much of the other institutional activity to address international environmental issues described in the rest of this volume. These UN processes have clearly been instrumental in raising the level of attention paid to environmental issues internationally, but specific action taken to address environmental problems within international institutions happens more prominently at the level of treaty institutions, discussed by issue area in the following chapters.

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3 Species and Biodiversity Conservation

The conservation of species makes sense as a focus for international institutions. Species that are under threat from individuals in multiple states cannot be adequately protected by any one state alone. The incentive structure for species management should be conducive to efforts at conservation: most species harvested for use have the ability to reproduce if sufficient numbers remain. Successful management can thereby ensure the future of harvesting by simply making sure that enough of a population remains to perpetuate itself. In other words, those who make use of a given species benefit in the long run by its conservation because they will be able to continue to harvest the species indefinitely if international institutions can successfully conserve species.

It is therefore not surprising that many of the earliest multilateral agreements protecting resources of any type pertain to the protection of potentially threatened species. The 1911 Convention for the Preservation and Protection of Fur Seals is one of the earliest examples of this type of treaty; the 1946 International Convention for the Regulation of Whaling (ICRW) (preceded by two other whaling treaties in the 1930s) is another. Even under these simple incentive structures, however, international cooperation for species protection has proved exceedingly difficult.

In international efforts to protect endangered species and conserve natural resources, cooperation has focused primarily on species that exist internationally or that migrate across jurisdictions. Early species protection agreements focused on the concept of using a species sustainably (though that terminology would not have been used at that time); the first types of agreements protecting endangered species were centered around ways to ensure that a sufficient breeding population would be left in the wild so that harvesting the species could continue indefinitely.

The idea of the protection of species and the conservation of natural resources has grown more complicated, in a number of ways, since the early idea agreements. The first is the idea that there may be some cases in which human use of species may not always be justified. Some species are particularly intelligent, show signs of suffering, or play an especially

important role in their ecosystems (these types of species are known as “keystone species”). It is argued by some that species in these categories should not be hunted under any circumstances. At the extreme there are those who suggest that the relationship of humans to their environment needs to change even more dramatically and that it is never justified for people to kill other species for their own use.¹

The second source of complexity is the evolution from a focus on a specific organism to a focus on the ecosystem in which that organism (and many others) operate. This evolution began as a consideration of how to best protect resources. The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (1968) (referred to as the Ramsar Convention) protects migratory birds, in part, by ensuring that the places to which they migrate will be conserved. Though the initial focus of negotiation efforts in this agreement was to protect specific species, it was acknowledged that without protecting the habitats on which they depend, other efforts at species conservation would fail.

The evolution of conservation away from a focus on individual species toward the idea that the ecosystem and the diversity of species (rather than the perpetuation of any one species) is of the greatest environmental value also reflects a genuine recalculation of what is important from a conservation perspective. Though these approaches are different they are in some ways compatible; protecting an ecosystem may be the best way to ensure the survival of a given species within it.

Early Species Conservation Agreements

Early species conservation agreements focused on specific species and were negotiated among a small number of parties. These agreements followed the “sustainable use” approach discussed above (without that terminology), in which efforts were made to ensure that species were not overhunted so that hunting could continue into the future. There were informal agreements between Russia and the United States as early as 1893. The North Pacific Sealing Convention (1911) among the United States, Great Britain, Russia, and Japan prevented seal catching beyond three miles from land (along with other conservation measures) to prevent seal populations from declining. States negotiated similar agreements to protect migratory birds, including a 1936 agreement between the United States and Mexico and the 1950 International Convention for the Protection of Birds among primarily European states.

A number of agreements to protect whales were negotiated in the first half of the 20th century as well. The Geneva Convention for the Regulation of Whaling (1931) was negotiated under the auspices of the League of Nations (the predecessor to the United Nations) to limit high seas whaling of depleted whale species and prohibit the harvesting of

whale calves. Some of the most important whaling states, notably Japan, Germany, and the Soviet Union, did not sign this agreement so there was a limit to how much it could accomplish. Another effort at restricting whale catches multilaterally was made in 1937 with the International Agreement for the Regulation of Whaling. This agreement designated a whaling season and set catch size limits, but it did not set limits on the number of whales that could be caught, and had little effect at protecting whales.² After World War II (and the interruption of whaling it caused) the main whaling states were able to pass the International Convention for the Regulation of Whaling (1946), which remains the governing agreement for the protection of whale species today and is discussed further in Chapter 4.

There were several attempts early in the 20th century to create general agreements on wildlife protection, but they did not succeed. The first was the London Convention Designed to Ensure the Conservation of Various Species of Wild Animals in Africa Which Are Useful to Man or Inoffensive (1900), which was an agreement among colonial powers. A second, similar, agreement came in 1933: The London Convention Relative to the Preservation of Fauna and Flora in Their Natural State. Both these agreements listed protected species in annexes, limited hunting of species considered to be threatened, and provided for licenses to export certain wildlife products. The 1900 Convention did not enter into force, but the 1933 agreement did (in 1936). The 1933 agreement lacked a broader institutional structure and thus the ability to make and oversee decisions to expand protection. It was therefore also unable to adapt to the end of colonialism and the changes in wildlife management this dramatic political change necessitated.³

A regionally focused general agreement was the Washington Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (1940), which contained an annex of species that parties were required to protect and controlled trade in protected species by requiring certificates authorizing export or import. Parties were required to create national parks and other wildlife conservation areas, including those where wildlife could not be hunted. This agreement was never fully implemented, at least in part due to the lack of secretariat or other institutional mechanisms to govern the treaty.⁴

Box 3.1 Selected International Agreements Protecting Species and Nature

The Convention for the Preservation and Protection of Fur Seals (1911 – no longer in force)

The London Convention Relative to the Preservation of Fauna and Flora in their Natural State (1933)

Washington Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (1940)
International Convention for the Protection of Birds (1950)
International Convention for the Protection of New Varieties of Plants (1961; revised 1978)
African Convention for the Conservation of Nature and Natural Resources (1968)
European Convention for the Protection of Animals During International Transport (1968)
BENELUX Convention Concerning Hunting and the Protection of Birds (1970)
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (1971)
Convention for the Conservation of Antarctic Seals (1972)
Convention for the Protection of the World Cultural and Natural Heritage (1972)
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1973)
Agreement on the Conservation of Polar Bears (1973)
Convention on the Conservation of Migratory Species of Wild Animals (1979)
Convention on the Conservation of European Wildlife and Natural Habitats (1979)
Convention on the Conservation of Antarctic Marine Living Resources (1980)
World Charter for Nature (1982)
Convention on Biological Diversity (1992)
Convention on the European Forest Institute (2003)
The Framework Convention on the Protection and Sustainable Development of the Carpathians (2006)
Agreement on the Establishment of the ASEAN Centre for Biodiversity (ACB) (2009)
Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable use of Marine Biological Diversity of Areas Beyond National Jurisdiction (2023)

Convention on International Trade in Endangered Species of Wild Fauna and Flora

One of the first truly global species conservation agreements still in effect is the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), signed in 1973. Pressure to create the agreement

began in the 1960s when species trade increased dramatically and the International Union for the Conservation of Nature (IUCN) began to ask its member states to restrict such trade. The IUCN General Assembly called in 1963 for the creation of a treaty to regulate trade in rare and threatened wildlife (and the skins thereof). It drafted an initial proposal for a convention, which circulated in the late 1960s, but negotiations stalled over disagreements between importing and exporting countries. In particular, developing countries led by Kenya wanted to be able to determine their own lists of species that could be traded, rather than relying on one collective list. The Action Plan agreed to at the Stockholm Conference in 1972 (see Chapter 2) included a resolution recommending that a conference be convened to negotiate "a convention on export, import and transit of certain species of wild animals and plants."⁵ Following Stockholm the United States convened a negotiating conference in Washington in February and March of 1973, armed with a US draft that attempted to include both the IUCN and Kenyan approaches.⁶

This agreement focuses on protecting endangered species through limiting trade, since it is often demand in one part of the world that affects conservation status in another part of the world. If trade in the most endangered species could be prohibited, the species might be better able to be protected because the incentive for killing or capturing these species would be diminished. Regulating trade is also easier, from an international relations perspective, than trying to influence what states do within their own borders. CITES requires almost no domestic obligations, only a commitment to follow the trade restrictions in question.

Each party to the treaty must designate a national management authority and a scientific authority responsible for determining whether conditions for trade have been made and issuing permits that allow trade to take place. States are also prohibited from trading in protected species with states that are not party to the convention, unless these non-party states meet all the requirements of the convention with respect to trade.⁷

The agreement operates by listing species on three appendices to the treaty. Appendix I consists of species that are the most seriously endangered. Commercial trade in these species is prohibited and trade for other purposes can only take place if it can be shown not to be harmful to the species' survival. A species listed on Appendix I can only cross borders when issued both an export permit from the country from which it originates and an import permit from the country for which it is bound, each indicating that the species was not taken in contravention of any conservation regulations and that the trade in this specimen will not harm the overall survival of the species.⁸ More than 1100 species are listed on Appendix I.⁹

Species are listed on Appendix II if they would be likely to become endangered if trade is not controlled. In other words, the whole purpose of Appendix II is to avoid having to engage in the level of restriction in

Appendix I. For Article II species, trade is tightly regulated. In order to trade in these species, or their parts, exporters must have an export certificate from the state indicating that trade will not harm the survival of the species, that any specimen was not obtained illegally under domestic law, and that shipment of living specimens will not harm them. The designated Scientific Authority in each state must examine the export permits granted generally, to limit them for the purposes of protection of the species in its range. Anyone who wants to import an Article II species must show a valid export permit.¹⁰ This appendix lists by far the bulk of the species regulated by CITES; nearly 40,000.¹¹

A third appendix allows states to list species within their jurisdiction that are protected domestically. If a species is listed on Appendix III, trade from the state that has listed it requires an export permit granted with the state's Management Authority's assurance that it was not taken in contravention of any domestic conservation regulations. In other words, this appendix serves primarily as international recognition of domestically protected species and allows states to seek international assistance in regulating trade in species they have protected but others may not have. There are currently just over 500 species listed on Appendix III.¹²

Institutionally, the Convention creates a Conference of the Parties (COP) that meets biennially to make decisions. While individual states may list species within their borders on Appendix III, species can only be listed on the other two (more restrictive) appendices with the approval of the COP. A proposal that a species be listed on Appendix I or II requires approval by two-thirds of the parties and after that becomes binding. Once a proposal is passed, any state has 90 days to decide whether to lodge a reservation, indicating that it will not be bound by the provision. (If any state enters a reservation the other states have an additional 60 days during which they can decide to do so as well.) After the reservation period has expired, all states that have not made reservations are bound by the provision, and no new states may enter reservations to the listing of that species. States may also remove reservations later.¹³

UNEP was chosen to serve the secretariat function for CITES, and the Conference of the Parties set up additional institutional structures. UNEP provided initial funding for the treaty operations, but a UNEP Governing Council decision in 1978 to phase out UNEP financing for CITES necessitated the creation of a CITES trust fund, with contributions from member states following the UN scale of assessment.¹⁴ CITES also runs a number of subsidiary bodies to allow the institution to function in between biennial meetings of the Conference of the Parties. These include a Standing Committee and committees on animals, plants, identification manuals, and nomenclature. Unlike many wildlife conservation agreements (or broader environmental institutions), CITES does not have a scientific committee, though there were – ultimately unsuccessful – efforts

in the late 1980s to create one.¹⁵ Instead, issues of the status of species are addressed by the relevant national scientific authorities (as created under CITES Article IX), and reviews by the Animals and Plants Committees help bring together information about species that are, or might become, protected by CITES.

As with most international environmental agreements, information on compliance comes mostly through self-reporting; states are obligated to generate annual reports with export and import data (as well as submit biennial reports on other measures they have taken to protect species under the agreement). These mandated reports, however, are often late or missing, and many of the ones that are submitted do not contain necessary information. The percentage of states reporting in a given year has ranged from a high of 80% in 1987 to a low of 30% three years later. The Secretariat began to address this problem directly in the early 1990s, and sent letters informing parties that failure to report would be considered a “major implementation problem” under the treaty. Reporting did increase following this effort but is still nowhere near complete, and many reports still contain missing information.¹⁶ Beginning in 2002, CITES adopted the practice of calling for trade restrictions with states with egregious problems submitting reports; that practice was formally adopted in the Guidelines for Compliance in 2007.¹⁷

One of the reasons for the importance of reporting in this process is that the information in the reports can be used as an additional way to check how well the overall system is functioning. Numbers of exported species to a country should match the number of imported species, and if they do not it is indicative of a problem of enforcement somewhere in the process. CITES does not provide a standardized reporting process for information at the species level, and variety in what information states report can make this comparison impossible to do. Late and incomplete reports contribute to the difficulty of this kind of analysis. Many species of concern involve trade with states with weak governance or significant corruption.¹⁸

Evolution of processes over time has made it easier for CITES to keep track of compliance-related information. The secretariat publishes an Infractions Report at each COP, listing those states that have breached trade rules. The organization also helps to increase the level of enforcement through training officials in member states who will be charged with implementing CITES rules. A more recent effort to improve data gathering and its role in enforcement include the 2010 creation of a working group to gather and analyze data on illegal trade, which began operation in 2011.¹⁹

CITES provides few direct consequences for noncompliance, but the Standing Committee, which reviews allegations of noncompliance, has frequently recommended that CITES member states restrict trade with those

states seen to be persistently flouting CITES rules. These trade restrictions can involve all commercial species trade, trade in all listed species for any reason, or trade in specific CITES-protected species. At the end of 2023 there were 30 states subject to trade restrictions. Afghanistan, Djibouti, Grenada, Libya, and Sao Tome and Principe were subject to restriction on trade in all species (and Liberia and Somalia to restrictions on commercial trade). Others, for example, included restrictions on specific species like certain skinks, butterflies, and clams with the Solomon Islands, West Africa seahorses with Senegal, and the African Kino tree (*Pterocarpus erinaceus*) with Cameroon, the Central African Republic, Chad, Gambia, Guinea-Bissau, Mali, Nigeria, and Togo.²⁰ Similar restrictions in previous years have encouraged non-member states to join the agreement and member states to implement previously ignored provisions.²¹

The best-known efforts under CITES are those to protect the African elephant. It is hunted for its ivory, which is primarily used for ceremonial and decorative purposes in countries in Asia. This species was listed on Appendix II in 1977 but population levels declined precipitously. In 1989 the COP voted to move it to Appendix I, amid much controversy. Many of the African states that opposed the Appendix I listing entered reservations, hoping to continue to sell ivory. But Japan, the largest importer of ivory, yielded to US and NGO pressure to support the Appendix I listing. Once on Appendix I the populations of elephants in some African countries stabilized and grew, such that in some areas the elephant populations were too large, in the assessments of those managing them, to coexist with human populations. In other states, however, the elephant population numbers remained low. Some of the states where elephants had been well protected argued in favor of “downlisting” the species to Appendix II to allow managed trade. These states argued that limited trade would allow them to earn money (including by selling off stockpiles of confiscated ivory) that could support their successful conservation programs financially. Zimbabwe threatened to leave the agreement and trade outside the system if CITES would not allow for renewed trade in elephant parts.²²

The tenth meeting of the COP in Zimbabwe in 1997 agreed to allow a partial downlisting; Botswana, Namibia, and Zimbabwe would be allowed to sell ivory internationally in a tightly managed program. Sales could only be to specified countries, which initially meant Japan. Trade would happen in conjunction with a system that would monitor both trade in elephant species and elephant killing overall, the creation of which was also authorized at that meeting. The program that resulted, Monitoring the Illegal Killing of Elephants (MIKE), collects and analyzes data on illegally killed elephant and social factors that contribute to the inability to protect elephants. It also helps elephant range countries enforce their own and international elephant-protection laws. A related CITES program, the Elephant Trade Information System (ETIS), compiles data

from law enforcement around the world on seizures of illegal ivory. This program is managed by the nongovernmental organization TRAFFIC. CITES also added “inadequate controls on ivory trade” to the conditions that can trigger trade suspensions.²³

After the 1997 decision to allow carefully monitored “one-off” ivory auctions, one collective ivory sale was allowed in 1999, involving Japanese purchases of raw ivory from Botswana, Namibia, and Zimbabwe. Namibia was allowed to sell some worked ivory but not raw ivory in 2004. In 2008 another auction allowed China and Japan to purchase raw ivory from stockpiles from South Africa, as well as Botswana, Namibia, and Zimbabwe.²⁴

In the wake of this renewed legal ivory trade, there was strong evidence of an increase in poaching. A 2019 study found that the sales in 2008 increased illegal ivory production by 66% and increased ivory smuggling from Africa by 71%.²⁵ In 2010 CITES created an African Elephant Action Plan (AEAP) along with the African Elephant Fund that gives grants to range states to support their elephant conservation efforts. The AEAP supports the creation of regional implementation plans and National Ivory Action Plans.

Since then, the extent of elephant poaching has varied by year and location; it remains high though it has likely decreased from the peak poaching period of 2008–2011. China is the largest destination for the illegal ivory trade, followed by Vietnam and Thailand. Populations of African elephants, meanwhile, are difficult to track systematically, especially because they are the most under threat in areas with low government capacity to monitor. On the whole, African elephant populations are still decreasing.²⁶

Overall, CITES has almost certainly improved the situation for African elephants, even if the populations are currently still under serious threat. The initial Appendix I listing allowed for the initial recovery of some elephant populations, and the current efforts to track illegal killing and provide guidance to range states on conservation is providing useful information that helps states protect elephant populations within their borders. Current CITES rules list the population of African elephants in four Southern African Countries – Botswana, Namibia, South Africa, and Zimbabwe – on Appendix II, allowing managed trade. All other African elephants (as well as Asian elephants) are listed on Appendix I.²⁷ Ultimately, though, as long as there is profit to be made in killing elephants, and corrupt or ineffective governance in states unable or unwilling to prevent it,²⁸ it will be difficult to completely end the illegal trade in ivory.

In assessing CITES more generally, one controversial element is the ability of states to enter “reservations” to the listing of species on CITES appendices. Those who do are not bound by the regulation in question. This approach is part of an effort to allow changes to protection status in a timely manner. Amendments to the appendices become binding on all

parties without having to go through a lengthy ratification process that would normally be required for changes to international obligations; this process allows the agreement to be modified quickly. But states – which have the ultimate decision over whether to join or remain in the agreement as a whole – would not agree to such a system if they did not retain the ability to opt out of decisions they found to be particularly objectionable. Most treaties that allow for changed obligations in this manner include some kind of reservation (also called objection) procedure. States may only enter reservations during the specified time period and are encouraged to remove them over time.

For the most part, the reservations process in CITES has not played a major role in undermining the objectives of the agreement, but there certainly are some instances in which it has prevented or delayed species protection efforts. One example is the efforts to regulate trade in the saltwater crocodile, which is killed to make leather products out of its hide. When CITES listed this species on Appendix I in 1979, France, Germany, Italy, Japan, and Switzerland – which at that point accounted for 80% of the trade in such leather – all lodged reservations.²⁹ In this case, however, the system worked as intended. With time and external pressure most of these states have removed their reservations. Certainly in some instances, states that are important markets or sources for endangered species rely on reservations – Japan for a long time had reservations for many listed sea turtle species – but for the most part the reservations process has not caused major problems for the protection of endangered species under CITES.

Overall, CITES has had mixed success in its efforts to protect species through trade. It faces an inherently difficult task, involving thousands of protected species (many of which look remarkably like unprotected species) at multiple points of export, with border inspections conducted by those untrained in taxonomy and too many inspections to carry out, and many opportunities to transport species across borders undetected. Those who intend to smuggle protected species can often do so without being caught. Major problems have come in developing states that simply lack the capacity to maintain control over their borders. The nature of CITES regulations also means that even when wildlife is protected from international trade there is no guarantee that it will be safe within states, which are not bound by CITES to create any domestic protection of regulated species.

While the treaty's focus is on both plants and animals, animal protection has gained more attention, and verifying the identity of plant products can be especially difficult. The agreement has thus had a greater degree of success restricting trade in endangered animal species than plants.³⁰ It has recently become more serious about trade in endangered timber species, however, adding a number of endangered hardwood

species (most notably rosewoods and ebonies) from Central America, Asia, and Africa to Appendix III at the request of Panama and Madagascar and as part of broader cooperation with the International Tropical Timber Organization.³¹

An additional problem with the implementation of CITES comes from the difficulty in managing Appendix II species. This appendix should be the centerpiece of CITES protections, and species listed on it should be able to be adequately protected by international efforts to manage trade. But the parties have been unable to make meaningful estimates of the potential of the impact of trade on these species because so little information is known on their abundance and population trends. In the face of uncertainty about what level of trade is acceptable, members of the agreement have tended to err on the side of allowing more trade rather than less. In this situation, species can be harmed by trade that is perfectly legal under the treaty but results from insufficient information to set realistic management goals.

To some extent, given the difficulties the CITES structure faces, its successes are all the more notable. Trade in Appendix I-listed species has generally declined, and the popularity of truly endangered species used in luxury goods (ivory in piano keys, fur coats from wild cats) has waned in favor of substitute products. In some cases, domestic ranching operations provide the raw materials (such as crocodile hides) that would previously have been harvested from endangered animals.³² Institutional efforts to protect endangered species by controlling trade have an uphill battle but have managed to accomplish some level of protection in some instances.

Convention on Migratory Species

The Convention on the Conservation of Migratory Species (1979) (CMS, or Bonn Convention) was also negotiated in the wake of the Stockholm Conference call for greater protection of endangered species. Recommendation 32 from the conference urged states, while enacting international species conservation agreements, to give special attention to “those which migrate from one country to another.” West Germany drafted an initial proposal for such an agreement in 1974, working with IUCN, and negotiations followed.³³ Seventy-seven states met for two weeks in Bonn in June 1979 for the final conclusion of the agreement. Difficulties arose over how to define migratory species. A major source of contention as well was whether the agreement would include marine animals, something that was opposed by the United States, the Soviet Union, and others. Similar proposals would have excluded Antarctic species. The final version does include aquatic species and includes “the entire population or any geographically separate part of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictable cross jurisdictional boundaries.”³⁴

The CMS takes a hybrid approach to the protection of endangered species. Like most preceding agreements to protect specific species it begins with lists of species, in appendices, that must be protected by member states. The first appendix lists species considered to be critically endangered; member states must “provide immediate protection for” these species, as well as take steps to conserve and restore their habitats and refrain from taking any action that will impede their migration. There are more than 180 species listed on Appendix I. The second appendix lists species with an “unfavorable conservation status” that therefore require international protection. States have fewer specific obligations with respect to these species but should cooperate to protect them. Nearly 340 species are listed on Appendix II.³⁵

The focus of this agreement, like CITES, is species that move from one place to another, only in the case of the CMS it is species that themselves migrate from one geographic location to another. The innovation of this agreement is that a primary way to protect species on Appendix II is for “range states” – those states through which a given species migrates and that exploit that species – to negotiate specific agreements to protect it. States that are not party to the broader convention but that are range states for a protected species can – and should – be included in these agreements. There have thus far been seven binding agreements negotiated under this process: to protect bats in Europe (EUROBATS); cetaceans in the Baltic and North Sea (ASCOBANS); cetaceans in the Black Sea, Mediterranean Sea, and contiguous areas (ACCOBAMS); African-Eurasian migratory water birds (AEWA); Wadden Seals, albatrosses, and petrels (ACAP); and gorillas in central Africa.³⁶ Each of these agreements creates its own governance structure, usually involving regular meetings, funding, and research and reporting.

In addition to legally binding agreements, states may also negotiate Memoranda of Understanding (MOUs). These informal agreements acknowledge the threatened status of the specific species to which they apply and constitute a nonbinding agreement to attempt to protect them. These types of agreements are largely intended to address short-term coordination and scientific research needs. Nineteen of these MOUs have thus far been negotiated, protecting such species as the Siberian crane, the slender-billed curlew, marine turtles of the Atlantic coast of Africa, marine turtles of the Indian Ocean and Southeast Asia, the Middle-European population of the great bustard, the bukhara deer, the aquatic warbler, West-African populations of the African elephant, the saiga antelope, cetaceans in the Pacific islands region, dugongs, the Mediterranean monk seal, the ruddy-headed goose, grassland birds of southern South America, high Andean flamingos, South Andean Huemul, migratory sharks, and birds of prey in Africa and Eurasia.³⁷ The shorter time it takes to negotiate these agreements (including the avoidance of a ratification

period) along with the higher extent of participation by range states (as compared to the formal agreements under the CMS)³⁸ suggest potential advantages to the use of MOUs for species protection under the CMS. The negotiation of agreements and other forms of specific species protection has increased in recent years.

Institutionally, the Bonn Convention creates a COP that meets approximately every three years to review implementation and make specific conservation recommendations. Decisions, including those to add or remove species from the appendices, require a two-thirds majority vote. After a successful vote to amend the appendices, all states are bound by the decision except those that make a reservation within 90 days after the decision.³⁹ A Standing Committee fulfills necessary governance functions between the meetings of the Conference of the Parties. The first COP created a Scientific Council to coordinate research and recommend conservation measures and species to add to the two appendices.⁴⁰ UNEP provides secretariat services, with the secretariat located in Bonn.

In past years the effectiveness of this agreement has been limited, in part, by lack of participation, but membership has been increasing in the past two decades. There are currently 133 member states, but some important ones (from the perspective of species protection) are still missing: the United States, Canada, China, and Russia are not a part of the agreement.⁴¹ The United States, Russia, and China have nevertheless agreed to participate in specific agreements (all three are members of the Agreement on the Conservation of Albatrosses and Petrels, for instance) and MOUs, as have at least 25 other states not bound by the convention itself, making participation more universal than membership numbers would suggest. Some regions, however, especially Southeast Asia, are underrepresented in the membership of the CMS and in the negotiation of specific agreements.

The more problematic gaps may be in species protection. For good reason the agreement has frequently focused its negotiation of MOUs or Agreements on species that are the most severely threatened, but many other species facing less dire threats in their range states are not yet the subject of Agreements or MOUs. Moreover, species protection within the institution is not geographically neutral: species whose ranges include European states are more frequently protected under CMS processes.⁴²

The functioning of the agreement has been hampered by financial difficulties. A number of parties are in arrears in their contributions, and the COP has periodically reduced the amount of the budget requested by the secretariat in order to decrease the amount required as dues to the organization. At the end of May 2023, 42 (of 133) member states were more than three years behind on their dues.⁴³

Of particular concern is the expanding institutional structure that results from the many agreements under the CMS, each of which has its own secretariat and meetings, and therefore requires additional resources.

Agreements and MOUs for which developing states are the primary range states suffer from the lack of large-scale funding mechanisms to assist with implementation. The institution has taken steps to address these difficulties. There is a small grants program, and the agreements to protect cetaceans and African-Eurasian waterbirds do have Agreement-specific funding mechanisms, the latter of which focuses on helping developing countries with implementation. In addition, the Eurobats agreement has a program that gives grants for small-scale bat conservation projects.⁴⁴

It can be difficult to determine what effect the specific agreements negotiated under the convention have had, largely because so little is known about the populations of these species to begin with. There are additional threats to these species that are not directly attributable to human activity (though in some cases they may be indirectly attributable). For example, in the Wadden Sea (which contains up to 40% of the world's population of seals), seal deaths have come largely from a distemper virus.⁴⁵

Nevertheless, there are some protected species whose populations have rebounded since CMS Agreements were negotiated, including Wadden Sea Seals, albatrosses and petrels, and the Bukhara deer.⁴⁶ Other agreements may be hampered by lack of full participation of relevant range states or by weak obligations. In many other cases, agreements have not been in place long enough to determine their effect. The fact that some of the most significant agreements and MOUs have been recently concluded, and that more states have been joining, suggests that the organization may be beginning to take a more active role in species conservation than it did for its first few decades of operation.

Other Early Species Conservation Agreements

There are other relevant species and nature conservation processes created by international agreement in the 1970s, primarily relating to wetlands and protection of natural heritage more generally. While these agreements do not have strong institutional processes, they have widespread participation by states and have probably have had some impact on nature conservation.

Ramsar Convention

The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (known as the Ramsar Convention) is sometimes considered the first treaty to involve the protection of ecosystems. Its negotiation brought together two different interests: protecting birds and preserving wetlands. The International Committee for Bird Protection, the International Waterfowl Research Bureau, and the IUCN proposed a treaty on this topic; negotiations toward an agreement began in 1963.⁴⁷

States party to the agreement must designate at least one wetland within their territory that they agree to safeguard from human encroachment; they can make changes to the boundaries of or remove a listed wetland as long as they replace it with a new one.⁴⁸

Institutional structure is weak, however. The original agreement did not provide for a funding mechanism (though a "small grants program" was added in 1990) and there is no provision for making changes to the treaty itself. Decisions in the agreement are made by a Conference of Contracting Parties, made up of representatives from all contracting states. It meets every three years and is in charge of overseeing the implementation of the agreement generally.⁴⁹ A Standing Committee meets annually to conduct business between the meetings of the Conference of Contracting Parties. The governing process also includes a Scientific and Technical Review Panel. IUCN serves as the secretariat.

Individual decisions have improved governance. In 1990 the Convention made the list of protected sites public. It also adopted a monitoring procedure, designed to assist parties in evaluating their protected sites (rather than punishing them for inadequate protection).

Ramsar has reasonably widespread participation, with 170 member states (including most of those with important wetlands). These states have collectively protected 2493 sites comprising more than 256 million hectares of wetlands.⁵⁰

The problem of wetlands destruction (generally associated with development) has not been ameliorated by Ramsar, though wetlands are certainly better protected than they were in the early 1970s, with beneficial impacts for migratory waterfowl as well. The most important development for the protection of wetlands has been the change in the general perception of wetlands. Where once they were seen as problematic swamps in areas that could otherwise be developed, they are now understood as beneficial ecosystems that provide useful ecological services. That change is likely more important than the specific protection of sites under Ramsar, but to the extent that the agreement has helped create that change it has had a diffuse impact nevertheless.

World Heritage Convention

The Convention Concerning the Protection of the World Cultural and Natural Heritage (generally referred to as the World Heritage Convention, or WHC) protects far more than wildlife; it takes as its purview the protection of sites of particular cultural or natural importance. States party to the agreement may propose sites within their boundaries that they deem worthy of international recognition. The World Heritage Committee, comprising 21 member states elected for six-year terms, decides whether a site may be placed on the list. States commit to the protection

of sites on the list and have access to a modest amount of funding in pursuit of this goal. One hundred and ninety-one states in the world, including all the most prominent ones, are members of the agreement.⁵¹

Box 3.2 Examples of Natural World Heritage Sites (and date first protected)

Galápagos Islands (Ecuador – 1978)
Virunga National Park (Democratic Republic of the Congo – 1979)
Tikal National Park (Guatemala – 1979)
Everglades National Park (United States – 1979)
Great Barrier Reef (Australia – 1981)
Serengeti National Park (Tanzania – 1981)
Río Plátano Biosphere Reserve (Honduras – 1982)
Rocky Mountain Parks (Canada – 1984)
Yosemite National Park (United States – 1984)
Hawaii Volcanoes National Park (United States – 1987)
Lake Baikal (Russia – 1996)
Mount Kenya National Park/Natural Forest (Kenya – 1997)
New Zealand Sub-Antarctic Islands (1998)
Pantanal Conservation Area (Brazil – 2000)
Chiribiquete National Park (Colombia – 2018)

Compiled with information from <https://whc.unesco.org/en/list/?type=natural>

The World Heritage Committee also maintains the list of “Word Heritage Sites in Danger,” identifying those protected sites that are threatened by such factors as war, pollution, urbanization, and tourism. For example, national parks and wildlife preserves in the Democratic Republic of Congo were placed on the list in 1994 because of the toll of years of war. The Río Plátano Biosphere Reserve in Honduras was also listed on the “sites in danger” list as between 1996–2007 to reflect “commercial and agricultural intrusion” into the area, and re-listed in 2011 at the request of Honduras.⁵² There has been controversy over whether a site could be inscribed on the “sites in danger” list without the acquiescence of the state in which it was located. This issue came up when some nongovernmental organizations proposed designating the Florida Everglades in the United States as endangered, over US opposition. The World Heritage Committee concluded, however, that sites could only be given that designation

with the approval of the state. Sites on this list – currently 55 out of 1157 sites protected by the process generally⁵³ – have access to additional funding.

One of the major difficulties faced by the efforts to protect “world heritage” is that the agreement is inherently contradictory in nature. It aims to protect the world’s most important natural sites by publicizing them, and states agree to list their sites primarily for the recognition, and resulting tourism, that accrues from being designated as a World Heritage Site. Income from tourism almost certainly helps contribute to the protection of listed sites, but the tourism that the list encourages inevitably decreases the ecological health of these locations, sometimes dramatically. It is a contradiction the WHC cannot address because it is at the core of the agreement’s operations.

Convention on Biological Diversity

The negotiation of the United Nations Convention on Biological Diversity (CBD), signed at the United Nations Conference on Environment and Development in 1992, represented a shift in conservation strategy from the previous approaches reflected in most of the organizations described thus far in this chapter. Instead of attention to individual species, it focuses on the whole of biodiversity conservation; the idea that it is the diversity of species and genetic material that must be protected, rather than specific species or locations.

Even before the negotiation of the CBD there had been some steps in this direction in international institutions. One such move came in the negotiation of the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) in 1980. CCAMLR is in many ways a traditional resource management agreement in that its goal is to ensure that the marine resources of the Antarctic are used sustainably so that they can continue to be harvested indefinitely. But the approach it takes, at least theoretically, is one of ecosystem management rather than a focus on individual species of concern. The idea is to take the entire ecosystem into consideration when setting catch limits for species in the area. The impact that a decrease in the population of one species has on its predator or prey species, for example, should be considered when setting catch limits. In practice this approach has been hard to implement, and CCAMLR has often functioned in ways sometimes indistinguishable from a traditional fisheries management organization. But it was important in introducing the concept of taking broader ecosystemic effects into consideration in global environmental governance.

The negotiations toward the CBD were initiated by IUCN, beginning in 1988. The UNEP Governing Council then called, in 1989, for the drafting of a convention that would address the conservation of ecosystems

and genetic material as well as species. From the beginning the goal was to create an “umbrella” agreement that would bring together existing international protections of species.⁵⁴ Negotiations exposed contradictory objectives between developed and developing states. Developing states prioritized protection of their rights to the benefits from biodiversity within their territory, and wanted protection from multinational corporations and from pressures from industrialized states. They were also concerned about the cost of new international obligations and wanted access to technology and funding. Developed states, on the other hand, wanted to increase their level of access to the world’s genetic material, much of which is located in developing states.⁵⁵ Some also argued that biodiversity should be seen as the “common heritage of [hu]mankind,” though this principle had been advocated inconsistently by developed states, which avoided such principles when their agricultural industries preferred proprietary access to genetic material they developed commercially. Along these lines, the United States and some others were concerned with the protection of intellectual property rights for pharmaceutical and biotechnological developments that come from biodiversity resources.

Because many of the areas with the greatest biodiversity are physically located in the jurisdiction of developing states, acquiescence to their sovereignty and aid concerns was necessary to achieve agreement. And since any funding and technology transfer would need to come from the wealthier states, some of their concerns needed to be met in order for them to agree to a treaty. UNEP Executive Mostafa Tolba personally helped broker the compromises among these positions that allowed the negotiations to be completed in time for the agreement to be signed in 1992 at the United Nations Conference on Environment and Development. It entered into force in December 1993. Currently 196 states are parties to the agreement.⁵⁶ The United States, however, is not among them; it signed the agreement in 1993 but has not ratified it.

The resulting agreement outlines three basic objectives: conservation of biodiversity, the sustainable use of biological resources, and a “fair and equitable sharing” of the benefits of using genetic resources. It reiterates an increasingly prevalent principle of customary law that states have “the sovereign right to exploit their own resources pursuant to their own environmental policies,” along with “the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states.”⁵⁷

The agreement is a framework convention that outlines a set of general principles states commit to, but contains little in the way of specific obligations. Parties are required to develop national biodiversity conservation strategies, to identify and monitor biodiversity, establish protected areas, and protect important biodiversity resources, and the agreement sets out related, and vague, goals for protection. There are specific obligations for

states to report to the COP on the measures taken to implement the treaty and on the effectiveness of these measures.⁵⁸

The treaty sets up an institutional structure as well. The organization is headquartered in Montreal, Canada, with UNEP fulfilling the secretariat role. The Conference of the Parties is the major decision-making body. It normally meets every two years, though it can meet in special sessions, as it has done during protocol negotiations. Most substantive decisions require a 2/3 majority vote though every effort is made to gain consensus. The exception is that financial rules and any modification to the rules of procedure require consensus and procedural decisions require only a simple majority.⁵⁹

The treaty creates a Subsidiary Body on Scientific, Technical, and Technological Advice (SBSTTA), which assesses biodiversity and the activities undertaken to protect it. It holds regular meetings and reports to the Conference of the Parties. Additional working groups can be created as needed, and at this point include working groups on indigenous knowledge and on protected areas. These working groups are established by the Conference of the Parties.

The CBD designated the Global Environment Facility (GEF) (see Chapter 7) as its interim funding mechanism. In initial negotiations most developing states (except those in Latin America) resisted using the GEF as the funding mechanism for the agreement, fearing that developed states exerted too much control in the institution. Part of the agreement Tolba brokered included designating the GEF role as interim and pressuring the institution for reform to address the concerns of developing countries. In addition, the COP is responsible for determining the extent of contributions to the GEF. The GEF was made the permanent funding mechanism for the agreement in 1994, and a memorandum of understanding was created between the two institutions. This agreement calls for a greater degree of CBD oversight of the GEF than would otherwise have transpired, including a period review of the GEF's effectiveness as the financial mechanism for the agreement.⁶⁰

The Convention allowed for – in fact, the negotiations assumed – the creation of protocols that would provide more specific implementation obligations. The first of these, the Cartagena Protocol on Biosafety, was signed in 2000 and entered into force in September 2003. There are currently 173 parties to this protocol.⁶¹ Negotiations took place beginning 1996 at the behest of developing states concerned about their ability to control the entry across their borders of genetically modified organisms (GMOs) that could harm natural biodiversity, supported by European States who generally favored tight controls on trade in GMOs. But the non-European agricultural exporting countries (including the United States, despite its lack of membership in the CBD) opposed restrictions on trade and held up agreement on the Protocol.

The focus of this agreement is avoidance of possible harms from genetic modification of organisms. The Protocol requires that states intending to export living modified organisms (LMOs; a subset of genetically modified organisms that are “capable of transferring or replicating genetic material”)⁶² assess the possible risks of this export and obtain informed consent from those states to which they are sending these products.

This process of seeking consent from importing states is called “advanced informed agreement” (AIA) under the Protocol; while it is almost indistinguishable from the process of “prior informed consent” (PIC) under treaties relating to trade in toxic and hazardous substances (see Chapter 6) the negotiators of the Biosafety Protocol chose a new term, perhaps in an effort to avoid the connotation that LMOs were hazardous.⁶³

Institutionally the most important aspect of the Biosafety Protocol is the creation of a Biosafety Clearinghouse through which information on potential risks of LMOs can be transmitted among parties. The Clearinghouse is established under Article 20(1) of the Protocol, to “assist governments and other users to fulfill their information-sharing obligations under the Biosafety Protocol.” It exists in electronic form, accessible on the internet, and provides information on national policies of member states and contact information for “national focal points” and “competent national authorities” as well as specific details of which states have, under advanced informed agreement, refused to allow the import of which specific LMOs.⁶⁴

The Biosafety Protocol helps developing states exercise sovereign control over what comes across their borders; as such, it is much more akin to the institutional processes to protect against transboundary hazards (as discussed in Chapter 6) than it is a direct protection of biodiversity. Both mechanisms likely have at least a diffuse beneficial impact on conservation of species, ecosystems, and genetic material, though at this point their benefits come largely through research, increased awareness, and the development of the general principle that protecting biodiversity is a broader task than simply conserving individual species.

One difficulty with the Biosafety Protocol’s operations is that the primary exporters of genetically modified organisms (The United States, Canada, and Argentina) have not ratified the agreement. There is evidence that the protocol is affecting institutional development within developing country member states, however. In particular, it may have helped imbed the use of scientific risk assessment and precautionary discourse into the domestic governing processes for genetically modified organisms. But, perhaps in part because there is no consensus on biosafety criteria, it has not had much direct influence on national biosafety legislation.⁶⁵ Importantly, it has implicitly built scientific capacity, through opportunities to participate within the Protocol’s processes. Along with more explicit

capacity-building activities, it will likely have long-term effects on the abilities of developing countries to make informed decisions about biosafety risks.

The second protocol negotiated under the CBD is the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, frequently referred to as the Protocol on Access and Benefit Sharing (ABS). Its negotiation was completed in 2010 and it entered into force in 2014. One hundred thirty-nine states (including the European Union) are members.⁶⁶ The protocol essentially attempts to prevent what some have called “biopiracy” – the practice by which the genetic resources from plant or animal species in developing countries are harvested, synthesized, and often patented, by wealthier states or corporations for economic gain, sometimes exploiting traditional knowledge about these resources to do so. Although the Convention as a whole affirms the sovereignty of states over their natural resources and the rights to states to benefit from the use of their genetic resources, it does little to address the practical questions of how states with a diversity of biological genetic resources can protect that sovereignty or share in the benefits that would come from sharing access to those resources. The Nagoya Protocol was negotiated to address these concerns.

Because of the inherently different opinions of states that have been either the beneficiaries or targets of prospecting for genetic resources, the negotiations of the protocol lasted for six years, from 2004–2010. The resulting protocol sets out the process by which countries allow for access to the genetic resources of their biodiversity and ensure that processes of “prior informed consent” (PIC) and “mutually agreed terms” (MAT) for accessing these resources, or the traditional knowledge associated with them, have been fulfilled. Parties name a “focal point” and a “national competent authority,” both of which provide information on what the relevant PIC and MAT processes are.⁶⁷ The protocol also creates an international clearinghouse for information relating to state policies on these issues, as well as individual permits issued (and “internationally recognized certificates of compliance”) for access and benefit sharing under this protocol.⁶⁸ States are required to ensure, via their domestic legislation, that the benefit sharing, especially with respect to indigenous populations, is fair and equitable. Many indigenous communities would have preferred that these obligations were spelled out in the protocol itself.⁶⁹ States are also responsible for enhancing transparency about these processes and monitoring the use of their genetic resources.

As specified in Article 31 of the Nagoya Protocol, the parties conducted an assessment of its effectiveness in 2018, four years after it entered into force. At that point, it was observed that not enough parties had established ABS legislation, and the overall conclusion seemed to be that

it was too early to make any broad conclusions about effectiveness of the protocol, especially whether implementation would lead to increased conservation and sustainable use of biodiversity.⁷⁰ A second assessment is scheduled for 2024. The elaborating of the underlying principles for access and benefit-sharing, as well as the creation of a process to implement them, is an important start.

At the same meeting at which the Nagoya Protocol was adopted, the parties negotiated a “Strategic Plan for Biodiversity 2011–2020.” This plan, referred to as the “Aichi Goals,” centered on a set of broad strategic goals, with smaller specific steps, for conserving biodiversity. Independent assessment suggests that indicators relating to the targets have varied, with some surpassing the goals, others moving in the wrong direction, and the vast majority showing some, but not sufficient, improvement.⁷¹ Post-Aichi (but delayed somewhat by the COVID-19 pandemic and ultimately adopted in 2022), the institutional structure of the CBD developed the Kunming-Montreal Global Biodiversity Framework (GBF), which sets four overarching goals with 23 targets, to be reached by 2030.⁷²

The Convention on Biological Diversity has ambitious goals but, as a framework convention, has little in the way of specific obligations or ways to ascertain its impact on biodiversity conservation. The underlying lack of knowledge about the vast array of species that make up the world’s biodiversity is perhaps the major impediment to successful conservation.⁷³ If we cannot even describe most of the world’s species, much less ascertain their health and ecosystemic role, it can be nearly impossible to determine if the convention is serving to protect them. Likewise, the inability of developing countries to control access to, and benefits from, these resources has made them an unequal participant in global efforts to identify and protect biodiversity. The two Protocols to the agreement tackle different aspects of the problem, primarily relating to concerns of developing countries about these aspects of control. What remains to be seen is what effect this strengthening of developing country control over, and benefit from, biodiversity resources has on the overall goal of greater conservation.

Quasi-Governmental Conservation Institutions

In the area of species and nature conservation, much of the institutional activity to monitor, evaluate, and research the status of species or the behavior of actors takes place outside of intergovernmental institutions, in organizations that have some governmental involvement and some involvement of nongovernmental actors. In many cases these organizations were the progenitors of the intergovernmental institutions described above.

International Union for Conservation of Nature

The International Union for Conservation of Nature began in 1948 as the International Union for the Protection of Nature. It was created out of a meeting called in France by UNESCO along with the government of France and the Swiss League for the Protection of Nature. In 1956 the organization changed its name to the International Union for Conservation of Nature and Natural Resources (IUCN), but frequently goes by a shortened version of that name. (In the period 1990–2008 it used the same acronym but the name World Conservation Union).

It is a hybrid organization, with membership from 85 states, 114 government agencies, more than 1500 nongovernmental organizations, and the participation of approximately 18,000 individual scientists.⁷⁴ It serves a variety of functions in the process of international conservation of species and ecosystems. Its complex membership means that it sometimes acts as an intergovernmental organization and sometimes as a nongovernmental organization, though it is really a combination of both; more than anything its role is as a scientific (and legal) advisory institution.

Originally the organization chose Brussels for its headquarters, but moved to Gland, Switzerland in 1961. Every four years the organization holds a World Conservation Congress, where decisions are made on the work program of the organization. This meeting of the full membership also elects a 32-member Council, which meets once or twice a year to conduct IUCN business, including setting priorities for the organization. The organization also maintains six standing commissions of experts that work on the implementation of IUCN priorities and give advice beyond the organization.

The Species Survival Commission (SSC), originally named the Survival Service Commission, is one of the six task forces of the IUCN. It was established in 1949 as a volunteer network of members around the world that work in more than 190 smaller task forces pertaining to specific species or habitats. Since 1966 the SSC has compiled the *Red List of Threatened Species*, generally acknowledged as the most complete list of the status of the world's threatened plants and animals.⁷⁵ The list categorizes more than 150,000 species as extinct, extinct in the wild, critically endangered, endangered, vulnerable, near threatened, or least concern (those that are not considered to be threatened) and also indicates where there is insufficient information to make a conclusion about status ("data deficient") or where a species has not been evaluated.⁷⁶ The organization uses carefully elaborated criteria in making the determination of species status that include population size and trajectory, geographic range and extent of geographic fragmentation, and population viability analysis. Some criticize this process, however, as being insufficiently transparent and overly politicized.⁷⁷ Others suggest that while the lists themselves are

not problematic, they are used by others for purposes for which they are not intended and are not well suited, such as for setting priorities and allocating limited resources for conservation. These lists tend to overrepresent some types of species (large mammals) and underrepresent others (insects and fungi). And it is argued that the level of extinction threat should not be the primary focus of conservation plans.⁷⁸

One of the most important roles of IUCN has been in working on the negotiation of international conservation agreements; doing so was one of its charter objectives. The IUCN Commission on Environmental Law is the main actor on behalf of the organization in this area. It played a central role in the drafting of the Ramsar Convention, the WHC, CITES, part XII of the United Nations Convention on the Law of the Sea (on the high seas, including conservation), the CMS, and the CBD.⁷⁹

It has other official roles with respect to international conservation agreements. For instance, the World Heritage Committee under the WHC is required to “cooperate with IUCN.”⁸⁰ IUCN cooperates closely with CITES and has observer status at CITES meetings. The organization also participates in the role of “expert advisor” to a number of the treaties on the Antarctic Treaty System and as a principal scientific advisor to the Conference of the Parties under the Convention on Biological Diversity.⁸¹ Its most institutionalized role is in the Ramsar Convention, where the IUCN performs secretariat functions.⁸²

IUCN also works with the WWF (itself an offshoot organization, founded by IUCN members but entirely nongovernmental) in the organization TRAFFIC, which monitors trade in endangered species. This organization was founded in 1976 to “ensure that trade in wild plants and animals is not a threat to the conservation of nature.” It was designed from the beginning to help collect information useful for the implementation of CITES, though its purview has since expanded and it issues reports on species trade more broadly.⁸³

World Conservation Monitoring Centre

The World Conservation Monitoring Centre (WCMC) was founded by IUCN in 1979 to “support international programs for conservation and sustainable development through the provision of reliable scientific data.”⁸⁴ A restructuring in 1988 added the WWF and UNEP as partners, and in 2000 the WCMC was subsumed entirely under UNEP as an implementing agency.⁸⁵ It currently maintains a number of databases relevant to protection of endangered species, including the Species Database (with information on conservation status of species) and the CITES Trade Database (with information on trade from annual reports of CITES members). It also manages species databases for the EU Wildlife Trade

Regulation and the Convention on Migratory Species, and helps with assessment of implementation for the Convention on Biological Diversity. Collectively these institutions serve as information sources outside of the specific treaty institutions described earlier in this chapter. As such, they expand the sources of knowledge available and are able to provide information in a way that is less directly tied to the regulatory process.

Conclusions

Species and biodiversity are difficult to protect. Effective conservation requires keeping track of the actions of huge numbers of people and thousands of species and ecosystems across vast spaces. Doing so is impossible without international collaboration, but also requires domestic action, and states are reluctant to yield sovereign control over their resources to international governance processes. Underlying the entire problem is a lack of knowledge – about species and ecosystems, about behavior. The institutions in this chapter, in different ways, have worked to increase the level and transparency of this issue, and have helped states control what happens across, or within, their borders.

There is a fairly high degree of overlap across some of the institutions designed to protect specific endangered species, as discussed further in Chapter 7. It may be that overlapping institutions provide conflicting advice and divide time and resources, increasing the difficulty of conservation. Or it may be that individual species or ecosystems stand a greater chance of successful protection because they are protected in different ways under different institutional structures. Or both.

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4 Ocean Commons

Global governance by maritime institutions has taken two different tacks over the past century. One began with a focus on the legal issues pertaining to international shipping. For centuries, or maybe even millennia, shipping has been the main way that goods have been transported internationally. Even now, 90% of international trade is transported on the ocean by ships.¹ Since the high seas do not belong to any sovereign state, rules about conduct on the high seas can only be implemented by international agreement. Initial efforts to govern ocean spaces involved issues of liability and salvage rights at sea, followed by rules on assistance to ships on the high seas. These evolved over time into agreements to increase the level of safety on ships, with an increasing concern (especially in the wake of the *Titanic* disaster) for those who work or travel on them. The International Maritime Organization is the international institution that addresses these issues.

The second approach involved attention to the resources of the ocean. Beginning in the 1970s, with an increase in global concern about environmental damage, the focus shifted to the prevention and mitigation of ocean pollution. In addition to, and intersecting with, existing regulatory institutions under the International Maritime Organization are those created by the 1982 United Nations Convention on the Law of the Sea and occasioned by the international legal changes stemming from it. Fisheries are another important ocean resource. Collective action to protect fisheries began in earnest by the mid-20th century, with another wave of fisheries organizations created in the 1980s. These institutions are numerous and narrowly focused, and though they have had difficulty preventing global overfishing, they have evolved to address emerging governance issues. Global – but less detailed – agreements have been made since then, but on the whole high-seas fisheries are not well managed, despite the plethora of institutions that attempt this task.

International Maritime Organization

The current institution with the most direct responsibility for ocean governance is the International Maritime Organization (IMO), which represents the culmination of a series of efforts to govern maritime activities, specifically related to shipping. Its earliest precursor was the Comité Maritime International, created in 1897 in Belgium with participation by seven other maritime states. It addressed legal issues related to merchant shipping, via 19 conferences held between 1897 and 1937.² It was involved in drafting a number of international agreements with respect to safety and salvage at sea, including the first version of the Convention for the Safety of Life at Sea (SOLAS) (1914), which has been modified and updated periodically since then and remains in force. Comité Maritime International still exists but as an international nongovernmental organization.³

During the First World War the Allied Maritime Transport Council, which operated between 1917 and 1919, was created to help with the logistics of transporting US troops across the Atlantic Ocean and ensuring the continuation of trade and necessary military uses of shipping during the war. Also important shortly thereafter in maritime governance was the League of Nations' Organization for Communications and Transit, which operated between 1921 and 1946. This organization was created partly to fulfill the mandates of the Treaty of Versailles that required Germany to adhere to any conventions "regarding the international regime of transit, waterways, ports or railways" approved by the League of Nations.⁴ Important effects of this organization included the recognition of the right of landlocked states to have merchant fleets and the elaboration of the principle that ships should be treated equally in maritime ports, regardless of flag. It also began the process of regularizing the measurement of ship tonnage.

Another institution with responsibility for coordinating shipping was created during World War II. In the summer of 1944, eight allied states (Belgium, Canada, Greece, the Netherlands, Norway, Poland, the United Kingdom, and the United States, along with unofficial representation from Denmark and the French Committee of National Liberation) discussed the coordination of shipping during the ending stages of the war and thereafter. These discussions led to the creation of the United Maritime Authority as the war was concluded. It operated in 1945 and 1946.⁵ This organization attempted to manage the transition between wartime and peacetime shipping operations.

The United Maritime Authority was designed to end six months after the official suspension of hostilities in the war. Before it ceased operating it recommended that the new United Nations organization establish an interim consultative council to take up its duties. The first of these successor

organizations, the United Maritime Consultative Council, operated briefly, beginning in March of 1946. The Economic and Social Council of the United Nations created another interim organization to fill this role, the Temporary Transport and Communications Commission, later that year. This commission began by examining existing international institutions pertaining to maritime issues and concluded that there were none that could meet the needs of international coordination. It recommended to ECOSOC that a permanent commission be established, and the United Nations pursued conversations with the United Maritime Consultative Council, which supported (and had already contemplated) the creation of such an organization.⁶

Negotiations to create this permanent organization, the Intergovernmental Maritime Consultative Organization, took place in 1948. Several initial disagreements in the drafting negotiations involved the scope of the new organization: whether shipping issues should be addressed by UN commissions or in a separate UN organization, and whether the mandate would be to address narrow technical issues pertaining to shipping or include broader commercial issues as well. The eventual agreement created a broad and independent organization that can address any shipping issues referred to it by the United Nations or its specialized agencies. The organization only came into being with the entry into force of its founding convention, which took another decade. The cooperative environment at the end of the war had subsided as business returned to normal, and states, and the shipping interests within them, were by then less willing to trust an international institution. Some states feared that the organization was too broad and others thought it was not sufficiently protective of the interests of the shipping industry; still others feared it would not focus on protecting those who worked on ships.⁷ Nevertheless, by 1958 a sufficient number of states had ratified the agreement that it could enter into force.

The organization is headquartered in London, the central location for international shipping regulation. All states that are members of the United Nations may join, and others may apply to become members, which they can do with the approval of two-thirds of existing member states.⁸ It is funded by assessed contributions from member states, based on the UN scale of assessments, with additional technical cooperation funding through voluntary donations. The size and structure of the IMO secretariat have not changed dramatically during the course of its existence, while the number of tasks it has taken on, and the number of member states in the organization, have increased dramatically. There are currently 175 member states. The Faroes, Hong Kong, and Macao have associate membership.⁹

The founding convention has been modified several times. The first modification came in 1977, when Article 2 of the original convention,

which stated that “the functions of the Organization shall be consultative and advisory,” was simply deleted,¹⁰ indicating the view of the member states that the organization was (and should be) doing more than simply advising. The name of the organization was changed in 1982 (to the International Maritime Organization, or IMO) as a further reflection of this change in focus.

The primary decision-making body of the organization is the Assembly, which meets every other year and includes all member states. The Council undertakes the business of the organization when the Assembly is not in session. The number of states on the Council has been increased periodically from the original 16 designated in the founding treaty. It currently consists of 40 states (half of which are states with particular involvement in shipping, and the other half of whom are elected to ensure geographic representation) and meets at least twice a year. Other bodies within the organization include the Maritime Safety Committee (MSC), the Maritime Environment Protection Committee (MEPC) (and its subcommittees), and a Legal Committee and Technical Cooperation Committee (TCC),¹¹ all as established in the IMCO Convention. Other committees (such as the Facilitation Committee) and subcommittees are created by the Assembly as needed.

One of the main difficulties in IMO governance was a change in the practice of ship registration. Ships are registered in states and, until the 20th century, states would only register ships owned by their citizens. For regulatory purposes these ships are considered to belong to the state in which they register and must follow all relevant domestic and international rules adopted by those states. As early as the 1920s, some states began to allow ship registration by non-nationals. Panama, Honduras, and Liberia were the first to register ships belonging to people from other countries and lured ship registrations in part by promising that registered ships would not be held to strict regulatory standards. Shortly after the Second World War the growth in ship registration in open registry states (also known as “flags of convenience”) increased dramatically.¹²

The phenomenon of open registration caused some initial controversy over governance of the IMO that has continued periodically, since representation in the organization and some of its committees were determined in part based on ship registration. For example, the composition of the Maritime Safety Committee originally was to be 14 states with eight of those positions designated for representatives of the eight largest ship-owning nations.¹³ By the time the agreement entered into force the growth in open-registry shipping meant that Liberia and Panama were among the eight largest registries (at third and eighth respectively). These states attempted to claim their place on the MSC. Their bid was opposed by the traditional maritime states, however, and neither was elected to the

Commission. This dispute was eventually decided by the International Court of Justice the following year, in favor of Liberia and Panama.¹⁴ Perhaps as a result, the MSC was expanded first to 16 members by the 1965 Amendments (which entered into force in 1968) and then to the entire IMO membership by the 1974 amendments (which entered into force in 1978).¹⁵

The IMO undertakes two sorts of regulatory activities. The most important of the IMO recommendations are issued as codes, such as the Code of Practice for the safe unloading and loading of bulk carriers,¹⁶ or the International Safety Management Code (or ISM Code; officially called the Guidelines on Management for the Safe Operation of Ships and for Pollution Prevention).¹⁷ While not legally binding, these codes represent IMO wisdom on how best to conduct operations. Most states implement these codes and other recommendations nationally. Often codes provide specific guidelines on how to implement conventions, and sometimes the treaties themselves refer the responsibility for providing such guidelines to the IMO.

Sometimes, however, a Code is created by amending an existing convention, as is the case for the International Ship and Port Facility Security (ISPS) Code, which was created as an amendment to the SOLAS Convention in 2002. In these cases the codes are indeed legally binding on states that have ratified the relevant amendments. Other codes may be made legally binding by the Assembly after they have been in operation for a while, as happened with the ISM code in 1998.

The IMO also issues recommendations pertaining to matters that have not yet been negotiated internationally. These sometimes serve as forerunners to the negotiation of legally binding instruments, or modifications of existing agreements. For example, the Recommendation on Basic Principles to Be Observed in Keeping a National Watch came about because of studies performed in the wake of ship collisions. These recommendations were later incorporated into the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) (1978).

The primary regulatory activity undertaken by the IMO comes through the negotiation of international conventions, though technically these are simply intergovernmental negotiations that are convened by the IMO, rather than IMO regulations *per se*. The IMO then also serves as the secretariat for agreements negotiated in this way. The IMO currently oversees more than 50 international agreements and protocols pertaining to ships, plus additional amendments.¹⁸ While some of them, such as SOLAS, were pre-existing agreements that have been periodically updated under the auspices of the IMO, most have been negotiated since the organization came into being. Because these conventions are negotiated individually,

each requires a separate process of ratification by states; not all IMO member states are bound by all IMO agreements.

Most IMO agreements have a double ratification threshold, in which a certain number of states accounting for a certain percentage of registered shipping tonnage must ratify for an agreement to enter into force. For example the International Convention for the Prevention of Pollution from Ships (MARPOL) (1973) required ratification by a minimum of 15 states that collectively accounted for at least 50% of the gross tonnage of the world's registered merchant shipping fleet.¹⁹ That threshold was not met within the first several years after negotiation, so a Protocol that modified the original agreement was created to assuage the concerns of potential member states. It separated obligations for oil discharges from those relating to hazardous chemicals, and adopted different requirements for new tankers versus those already in service. The convention and protocol eventually entered into force as MARPOL 73/78.

Even though members need not accept IMO-negotiated agreements, the organization has a high degree of participation in its conventions, including by the major shipping states. The states party to MARPOL now represent nearly 98% of the world's registered tonnage. The same is true for the STCW and The International Convention on Load Lines (1966). Other agreements that have entered into force represent a lower percentage of registered tonnage among member states, such as International Convention for Safe Containers (1972), whose members account for 65% of registered shipping. Some, such as the 1993 Protocol to the 1977 Torremolinos International Convention for the Safety of Fishing Vessels, have not yet met the minimum threshold to enter into force; others, such as the International Convention for the Safe and Environmentally Sound Recycling of Ships (2009), have only recently done so.²⁰

The IMO classifies its agreements into three categories: safety, marine pollution, and liability and compensation, though some do not fit into this categorization. The organization's initial focus was safety, updating the SOLAS convention, which is considered to be the centerpiece of modern efforts on maritime safety. The original version of the Convention was created in 1914 in the wake of the *Titanic* disaster; it was renegotiated in 1929 and 1948, and by the IMO in 1960. After the 1960 version proved difficult to amend in a timely manner, a substantially revised SOLAS agreement was negotiated under IMO auspices in 1974. It is the 1974 agreement that is the current operational version; it has been amended more than 35 times since then.²¹

The IMO also oversaw the negotiation of the STCW Convention in 1978, which standardized training and qualification requirements across states and allowed those who hired seafarers to be able to determine what training they had undergone. The agreement was completely overhauled

by a 1995 amendment that entered into force in 1997. It was amended in 2010 to include increased requirements for a variety of qualifications and measures to prevent fraud in certification. A similar agreement (SCTW-F) was negotiated in 1995 for personnel on fishing vessels.

The regulation of marine pollution has become one of the most important aspects of IMO governance. MARPOL, which now mandates equipment standards that oil tankers must adopt in order to prevent operational discharge of oil, has fundamentally changed the way ships are built and has dramatically decreased the extent of oil pollution.²² Later amendments added provisions requiring that double hulls be installed on newly built tankers as well as the eventual retrofit of older tankers²³ in an effort to decrease the likelihood of accidental oil spills. The agreement also mandates that specified chemicals only be discharged at designated reception facilities, and forbids discharge under any conditions of these substances within 12 miles of land.²⁴ MARPOL has optional annexes that attempt to minimize pollution by sewage, garbage, and harmful packaged substances. An annex, which entered into force in May 2005, limits air pollution (sulfur dioxide, nitrogen oxides, and ozone depleting substances) from ships,²⁵ and a 2011 modification created a Efficiency Design Index (EEDI) and a Ship Energy Efficiency Management Plan (SEEMP). These latter measures were adopted over strong opposition from some large developing countries like China, India, and Brazil.²⁶

Additional IMO agreements address aspects of oil pollution. Among these are provisions for coastal states to take emergency action “to prevent, mitigate, or eliminate danger to its coastline” when faced with the dangers of an oil spill nearby and the requirement that states create emergency response plans for use in case of oil spills.²⁷ Later agreements included the same measures for noxious and hazardous substances other than oil.²⁸

The IMO oversees conventions that address other pollution issues as well. Most important among these is the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972), referred to as the London Dumping Convention or, more recently, simply the London Convention. Prior to this agreement it was common for states to dispose of municipal and industrial waste by dumping or incinerating it at sea. The London Convention prevents states from intentionally disposing at sea a set of wastes listed on a “black list” in the agreement and requires them to gain permits before disposing of other types of waste intentionally.²⁹ Amendments concern incineration of waste at sea and prohibit the dumping of low-level radioactive waste. A protocol negotiated in 1996 (that entered into force in 2006) replaced the entire convention with an agreement that takes a more precautionary approach, requiring that all dumping be banned unless it can be demonstrated to

cause no harm. The Protocol has been amended to address newer forms of dumping, including precautionary approaches to the climate change management strategies of carbon sequestration on the ocean floor and the possibility of “iron fertilization” of the ocean to take up carbon (though this amendment has not yet entered into force), as well as regulating waste export for dumping; sewage sludge was also removed from the list of acceptable dumping materials. The carbon sequestration one is the only one thus far to have entered into force.³⁰

The IMO did not convene the negotiation of the original London Convention but was made the secretariat for the treaty; in that role it was in charge of the negotiation of the 1996 Protocol. The agreement has reasonably widespread membership but lacks important participation from coastal developing states, and the obligations for states to report on their dumping activities are often unmet. Nevertheless, the level of acceptance of the practice of dumping wastes into the ocean has decreased dramatically under this regime.

Efforts to address both safety and pollution have led to an additional focus on compensation for those that are victims of unsafe ships or oil spills and allocating responsibility for problems that arise. The IMO oversees a number of agreements that assess liability from different angles: some limit the extent of liability that ship owners may face; others create mandatory levels of compensation for victims of accidents or pollution.

Several IMO agreements do not fit into any of these categories. The most important of these is the International Convention on Tonnage Measurement of Ships (1969), which standardized the way that the size of ships was measured around the world. This standard measurement now forms the basis for most of the world’s information about, and regulations pertaining to, ships.

The IMO has been slow to address issues relating to climate change and the greenhouse gas emissions of shipping in particular, but more recently it has begun more serious efforts. In addition to the energy efficiency amendments to Annex VI, the MEPC began in 2018 with an efficiency target of reducing carbon dioxide emissions per mile traveled (initially by 40% by 2030), with a goal of reducing overall greenhouse gas emissions from shipping by 50% by 2050.³¹ Its most ambitious pledge came in 2023, when the MEPC formally adopted a strategy to aim for net-zero greenhouse gas emissions from shipping by around 2050 (with intermediate goals for staged decreases). This pledge is, at this point, a target, without specific legal obligations (and with caveats like “when national circumstances allow”), but it is a major advance over the IMO’s earlier reluctance to promise much more than increased efficiency in shipping, and its opposition to climate rules that resulted in shipping emissions being exempted from regulation under the Paris Agreement on Climate Change³² (see Chapter 5).

Box 4.1 IMO Conventions

Maritime safety

- International Convention for the Safety of Life at Sea (SOLAS), 1974
- International Convention on Load Lines (LL), 1966
- Special Trade Passenger Ships Agreement (STP), 1971
- Protocol on Space Requirements for Special Trade Passenger Ships, 1973
- Convention on the International Regulations for Preventing Collisions at Sea (COLREG), 1972
- International Convention for Safe Containers (CSC), 1972
- Convention on the International Maritime Satellite Organization (INMARSAT), 1976
- The Torremolinos International Convention for the Safety of Fishing Vessels (SFV), 1977
- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978
- International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F), 1995
- International Convention on Maritime Search and Rescue (SAR), 1979
- International Convention on Standards of Training, Certification, and Watchkeeping for Fishing Vessel Personnel (STCW-F), 1995

Marine pollution

- International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)
- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (INTERVENTION), 1969
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (LDC), 1972
- International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990
- Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (HNS Protocol)
- International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS), 2001

- International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004
- The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009

Liability and compensation

- International Convention on Civil Liability for Oil Pollution Damage (CLC), 1969
- International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (FUND), 1971
- Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material (NUCLEAR), 1971
- Athens Convention Relating to the Carriage of Passengers and Their Luggage by Sea (PAL), 1974
- Convention on Limitation of Liability for Maritime Claims (LLMC), 1976
- International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS), 1996
- International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001
- Nairobi International Convention on the Removal of Wrecks, 2007

Other

- Convention on Facilitation of International Maritime Traffic (FAL), 1965
- International Convention on Tonnage Measurement of Ships (TONNAGE), 1969
- Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA), 1988
- International Convention on Salvage (SALVAGE), 1989

Prepared with information from: <https://www.imo.org/en/about/Conventions/Pages/ListOfConventions.aspx>

Criticisms of the IMO abound. There is concern over the mixed level of implementation of IMO conventions, even when states have legally adopted them. Though it is up to individual states to decide whether to adopt IMO-run agreements, the organization has not done much to

persuade states to take on obligations. More importantly, once states have committed to following IMO rules, the organization has not done as much as some advocate to ensure that they are following the rules they have accepted.³³ The organization is also less transparent than many other international environmental institutions in terms of its control over access to information about its conventions and the behavior of member states.

Governance difficulties in the IMO come from the distribution of various types of power and influence across member states. The traditional European and North American maritime states (who are, not coincidentally, the most powerful states in the international system generally) have less influence in the IMO than originally envisioned because of the growth in flag-of-convenience ship registration, most of which takes place in developing states. A tension thus exists in the system between states generally powerful internationally that do not have as much structural influence and those states that are centrally important in determining international ship standards but do not otherwise have much international influence. Another difficulty the organization faces in adopting strong environmental protections is the central role that the shipping industry plays in the IMO governance processes.³⁴

The most important impediments to strong governance on shipping issues, however, are domestic. Shipping is of central importance to most economies, and cheap shipping (without a high degree of external regulation) is of interest to the most powerful constituencies within these states. International trade depends on the availability of cheap shipping, which in turn depends on an international regulatory system that does not demand too many costly standards for ships. Because of the role of shipping in the economies of states, they are loath to do too much to antagonize these constituencies, leading to less regulation and oversight than governments initially call for.

Nevertheless, there is much that the IMO has done well. It has led the negotiation of a vast number and array of international agreements on ocean pollution and safety that have certainly improved conditions. An external review of the organization conducted in 2001 pointed to successes in passing increasingly strict regulations in the wake of major accidents, the ability of the organization to adapt to an increasing international focus on environmental issues, and in decreasing the amount of oil pollution from tankers due both to accidents and other causes.³⁵ Another study suggested that operational oil discharges to the oceans (the first target of MARPOL) decreased from 1.49 million to 0.47 million tonnes between 1981 and 1997.³⁶ In addition, the secretariat has been lauded for providing technical expertise that has influenced ship design and construction and for building the capacity of member states to adopt and implement its regulations.³⁷

The fact that one institution addresses different types of issues pertaining to ships is a major advantage of the IMO framework. These seemingly disparate issues are in fact linked. Agreements to provide for increased

safety on ships decrease the likelihood that they will cause environmental disasters. Design features to prevent pollution may have impacts for the people who work on ships. The issues of compensation and liability are in direct response to problems with safety and pollution that other IMO agreements address. Because the IMO is one forum in which many of these issues can be addressed simultaneously, the interconnections can be accounted for. The IMO has served as a central mechanism for regulatory efforts pertaining to marine pollution and other regulations and has played this coordinating role reasonably successfully.

United Nations Convention on the Law of the Sea

The United Nations Convention on the Law of the Sea was negotiated in the Third United Nations Conference on the Law of the Sea (UNCLOS III; the treaty is often simply referred to as UNCLOS). Discussions began in the General Assembly's Committee on Peaceful Uses of the Seabed in the late 1960s, after Arvid Pardo of Malta brought up the issue of access to deep seabed resources. Increasing pressure came from the United Nations General Assembly more broadly for a universal law of the sea in the wake of the 1972 Stockholm Conference, and negotiations began in 1973. The completed draft emerged, finally, in 1982. As the title suggests, it was not the first effort to create an overarching governance structure for the oceans, even under the United Nations. The first and second United Nations Conferences on the Law of the Sea were convened in 1958 and 1960. The first of these produced four international agreements addressing territorial seas, the high seas, fishing on the high seas, and the continental shelf, though the environmental provisions in these were weak or nonexistent. The second conference attempted but failed to delineate the extent of the territorial sea.

The goal of UNCLOS was to create one legal instrument in which all peacetime ocean regulations could be consolidated, to prevent contradictions among or gaps between existing international laws pertaining to the oceans. The scope of the 1982 agreement is large: its 320 Articles and nine annexes attempt to cover all aspects of ocean regulation. Rather than provide specific substantive obligations, the agreement primarily creates a framework for governance, indicating which entities have authority over which areas. It is most widely known for its role in creating the jurisdictional area of the Exclusive Economic Zone (EEZ), an area extending 200 nautical miles out from a state's coastline in which the state may control access to resources. This process put more than 35% of ocean spaces under some form of national jurisdiction.³⁸ It also redefined the legal nature of the continental shelf and the territorial sea. States were given complete sovereign control over the resources of the natural waters extending 12 miles out (the previously accepted distance was three miles)

from their coasts while still allowing a right of innocent passage by ships in such territorial waters³⁹ and over the "sea-bed and subsoil" that constitutes "the natural prolongation of [their] land territory to the outer edge of the continental margin," that can be delineated at 200 miles from shore or further if the continental margin can be shown to extend that far. If states choose to exploit resources of the continental shelf beyond 200 miles from their coasts they must, after five years of exploitation, pay a small but increasing percentage of their revenue to an international fund (under the International Seabed Authority, discussed below) that will redistribute the wealth to other parties to the convention, taking special consideration of the needs of developing states.⁴⁰

The obligations that UNCLOS creates within specific ocean issues are normative and often vague, and generally require that states participate in existing institutional structures for governance. On ocean pollution, for example, UNCLOS mandates that states reduce and control pollution. States must take any necessary measures to "prevent, reduce and control pollution of the marine environment from any source" and must ensure that "activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other states." States must generally monitor the risks and effects of pollution and publish available data from this monitoring process. Coastal and port states are given new authority to enforce rules against polluting vessels.⁴¹

UNCLOS does, however, create a number of new institutional structures. Among these are the International Seabed Authority (ISA) and the International Tribunal for the Law of the Sea (ITLOS). The International Seabed Authority was created to oversee any extraction of minerals from the deep seabed. This aspect of the law of the sea negotiation was among the most controversial and divisive. Developed countries favored a "first come, first-served" principle of access to these resources. As the only seabed mining entities with the technology to be able to conduct such mining operations in the near future, they wanted acceptance of their rights to do so commercially. Developing countries preferred a "common heritage" approach in which mineral exploitation would be only conducted through an international organization in hopes such an arrangement would ensure their benefit from these resources.⁴² The resulting arrangement represents a creative compromise between these two positions. The deep seabed is considered to be "common heritage," and UNCLOS creates a complicated set of procedures for making use of these resources, governed by the ISA.

The right of an UNCLOS party to explore or exploit the resources of an area in the deep seabed requires a contract from the ISA. A member state of UNCLOS (or a company sponsored by a member state) proposes two areas to explore. One is awarded to the company or state and other is reserved for the ISA to either exploit on its own through its commercial

entity, the Enterprise, or to be designated for mining by a developing country. Any entity conducting mining operations under this system must pay royalties to the ISA, which will “distribute the receipts equitably, taking into account the interests and needs of developing countries.”⁴³

The ISA itself is headquartered in Kingston, Jamaica. It held its first meeting in 1994 and became fully operational in 1996. It includes an Assembly (made up of all members of the ISA, each of whom has one vote) and a Council of 36 members elected for four-year terms. Members are elected within five different categories, to ensure that large consumers, large investors, land-based producers, and developing states (including those with special interests such as large populations or landlocked status) are represented, along with general geographic representation. The Council has the authority to decide issues of seabed exploration by supermajority (two-thirds or three-quarters) or consensus, depending on the specific issue.⁴⁴ The ISA also operates a Legal and Technical Commission and Finance Committee.

Also under the ISA is the Enterprise, the UNCLOS-created entity that is designed to undertake the actual exploitation of deep seabed minerals. This is one of the most controversial elements of the agreement. As of 2023 the Enterprise has not yet been constituted and is not operating.

These provisions on the institutional oversight of mining and the extent to which they are designed to redistribute wealth internationally were the primary reasons given for the refusal of the United States to ratify the agreement. The controversy over these provisions led to the negotiation of an additional agreement, the Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (1994). This agreement modifies a number of the procedures to be followed by the Authority set up under UNCLOS. It ensures US representation in the Council, and modifies several aspects of voting and representation to increase the influence of the United States in decision making in the ISA and the Council. It also removes these bodies from choosing among mining applicants deemed to be qualified, instead allocating access by a first-come, first-served process. An UNCLOS requirement that companies engaged in mining be obligated to transfer technology to developing states and to the Enterprise was deemed by the Agreement to “not apply” in favor of a general duty of cooperation to ease the acquisition of such technology, and the parties are not required, as they would have been under UNCLOS, to fund the activities of the Enterprise.⁴⁵ The Agreement entered into force in July 1996. The United States has signed, but as of 2023 has not ratified, this agreement.

The initial work of the ISA focused on organizational matters, including drafting a set of regulations for mineral exploration. In 1997 it began considering the first proposals from states for mineral exploration.

The first contracts for 15-year exploration were signed in 2001; by 2023 22 different entities have been granted exploratory contracts, some of them for more than one substance. Most of these are geographically situated in the Clarion-Clipperton Zone, located between Mexico and Hawaii, though there is exploration in seamounts and ridges in the Western Pacific Ocean, Indian Ocean, and elsewhere.⁴⁶

Under the rules of UNCLOS, the ISA was supposed to have completed a set of rules governing commercial mining by July 2023; it did not meet that deadline and, given the need for any mining operations to undergo environmental impact assessment, it is unlikely that such mining will start before 2025.⁴⁷ The new UNCLOS agreement on Biodiversity Beyond National Jurisdiction, discussed below, will likely have implications for use of the seabed for mining since it governs any activities in the ocean outside of national jurisdiction that could affect biodiversity.

UNCLOS specifies that states are to settle disputes peacefully and offers them a choice of dispute settlement instruments. The most important of these are the International Tribunal for the Law of the Sea (ITLOS), an arbitral tribunal, and a special technical arbitral tribunal. States are also allowed to make use of the International Court of Justice for the obligation they accept when joining UNCLOS to settle disputes by peaceful means. UNCLOS member states elect by secret ballot the 21 independent individuals who compose the International Tribunal for the Law of the Sea. The tribunal began operations in 1996, headquartered in Hamburg, Germany, and as of mid-2023 had decided 32 cases.⁴⁸

In addition, as part of the UNCLOS effort to bring together ocean regulations generally, the straddling stocks agreement (also referred to as the “fish stocks agreement”) elaborated an obligation on the part of states to conduct their international fishing in accordance with the regulations of regional fishery management organizations and to negotiate international cooperative agreements to protect these resources where none exist. If they do not do so, they lose access to these resources.⁴⁹

The newest agreement under UNCLOS addresses what has come to be known as “biodiversity beyond national jurisdiction,” (BBNJ) which includes all the living and genetic resources of the high seas. Negotiations began formally in 2017, though there had been calls for such an agreement for two decades. The Agreement Under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction, also referred to as the “BBNJ Treaty” and the “High Seas Treaty,” was adopted in June 2023, though it requires 60 ratifications before it enters into force. Geographically, the area it governs accounts for approximately two-thirds of the area of the world’s oceans.

This agreement, which is strongly influenced by the Convention on Biological Diversity and its protocols (see Chapter 3), affects conservation

of marine life on the high seas. It has four main components. First, it addresses access to, use of, and – in particular – the equitable sharing of the benefits from the genetic resources of the high seas, though the agreement specifies that these provisions do not apply to fishing. It requires prior notification of activities that make use of this genetic material, and requires the sharing of scientific data, as well as the profits, from any use of this genetic material; it also creates a “clearing-house mechanism” through which notification and benefit sharing will be managed. This mechanism will also be used for the other purposes of the agreement.⁵⁰

Second, the agreement lays out a process for the use of “area-based management tools,” such as the creation of marine protected areas (MPAs), to protect biodiversity by restricting human activity. Parties can propose such areas, and the agreement requires consultation with potentially affected parties. Although the process aims to adopt such tools by consensus, it does allow for their creation with a three-quarters majority vote if consensus is not reached.⁵¹

Third, the agreement requires environmental impact assessment (EIA) for any activity on the high seas that could affect biodiversity (or even those within EEZs that could affect the biodiversity of the high seas). Any activity that has even the slightest potential to cause harm must go through a screening process to determine whether a full EIA is required. Such an assessment must include social and cultural as well as economic impacts. EIAs conducted under the agreement must include public notification and comment and be made publicly available.⁵²

Finally (along with other structures and processes), the agreement provides for capacity building, transfer of technology, and financial assistance for developing states. Importantly, in addition to envisioning direct transfers of technology and capacity building among states, the agreement creates a funding mechanism to which wealthier states will be obligated to contribute and that will help developing states implement the agreement; funding will also come from profits from exploiting marine genetic resources and voluntary contributions.⁵³ Overall, this agreement has the potential to make a serious difference in how high seas resources are accessed and protected, once it is up and running.

In addition, UNCLOS reinforces existing institutions and the rules they have created. It refers in multiple locations to the necessity of joining existing organizations. It also refers to the necessity of establishing agreements and standards internationally to control such things as pollution from ships. UNCLOS designates a number of functions to the relevant “competent international organization,”⁵⁴ which most commentators interpret to be the IMO in the contexts in which it operates.⁵⁵ UNCLOS also makes repeated reference to “generally accepted international rules,”⁵⁶ which are generally interpreted as IMO rules. For instance, UNCLOS indicates that foreign ships exercising the right of innocent passage through another

state's territorial sea must comply with "generally accepted international regulations relating to the prevention of collisions at sea,"⁵⁷ a reference to the only existing set of regulations under IMO's COLREG Convention.

Moreover, the IMO is functionally given additional jurisdiction in some contexts to approve rules that states themselves propose. Articles 41 and 53, for example, indicate that states designating sea lanes and similar measures can only do so with approval from "the competent international organization," interpreted as the IMO; the agreement doesn't mention what procedure the IMO should use for this approval process, thus giving a wide degree of autonomy to the institution. These provisions in UNCLOS have the effect of expanding IMO jurisdiction to states that have not ratified individual IMO conventions (but have ratified UNCLOS), since these obligations are accepted in UNCLOS as the relevant governing regulations for using the oceans.⁵⁸

It took a long time for UNCLOS to gain a sufficient number of ratifications to become operational; it entered into force in November 1994, 12 years after its negotiation was complete and more than 20 years after negotiations began. As of mid-2023, there are 168 parties to the agreement.⁵⁹ Some important states, such as the United States, remain outside the agreement. Many of the provisions of UNCLOS, however, are viewed as evolving into customary law through their active use by states and thus are considered to be binding on all states regardless of ratification status. These include provisions pertaining to EEZs, territorial sea, rights to innocent passage, prevention of pollution, and others. Many states that are not UNLCOS members nevertheless follow most of its provisions.

Fisheries Institutions

Institutional arrangements to conserve fisheries were among the earliest efforts to protect natural resources internationally. The Convention on North Sea Overfishing, for example, was negotiated in 1882 to harmonize domestic fishing regulations. Others, such as the Agreement for the Establishment of the Asia-Pacific Fishery Commission (1948) and the International Convention for the Northwest Atlantic Fisheries (1949) followed in the mid-20th century. This early focus is understandable: open-ocean fisheries cannot be conserved except by international cooperation, since no one actually has jurisdiction over the oceans. Fisheries therefore represent the perfect instance of an open-access resource that underpins the notion of a "tragedy of the commons."⁶⁰ These resources create their own incentive for management: if enough fish of a given species remain in the ocean, they will reproduce and thereby create new fish, and they do so on a reasonably short time frame for natural resources. If fishers can successfully cooperate to ensure that sufficient numbers remain, they will be able to

continue fishing indefinitely. Yet even with this incentive structure it has been difficult to manage international fisheries successfully.

Initially the resources of the sea seemed sufficiently inexhaustible that no one considered the need for international governance. That very abundance, however, led to a focus on how to harvest them more efficiently and in greater amounts. Technological advances made possible the use of factory ships that could stay out for more than a year and process their catches on board. At the same time, the increasing availability of refrigeration, coupled with newly efficient forms of travel, meant that catches could be frozen and transported, relatively cheaply, over long distances. Ocean fish thus became a staple food for people in the interior of countries. The decreasing cost and increasing speed of transport also meant that fresh fish could be shipped long distances. Technology was also used in the service of finding and catching fish: first radar and then sonar were used to locate large schools of fish. GPS technology aided ships in navigation to fishing grounds. All of these contributed, along with the increasing use of driftnets and longline fishing techniques, to the alarming decline in the abundance of commercially harvested fish stocks.

Fishery institutions, often referred to as regional fishery management organizations (RFMOs), generally regulate fishing by concentrating on a region, a species, or some combination of the two. Most important are the institutions that set fishing policy for their member states, with decisions that restrict fishing seasons, locations, equipment, and species and amount of fish that can be caught. Most of these organizations share a number of similarities in their regulatory processes. Commissions are empowered to make annual regulatory decisions that change rules for states each year without the requirement that states ratify the new rules. In general these fishery commissions have scientific committees that conduct or gather research and make recommendations to the decision-making body about what a sustainable level of catch would be. This scientific process is separate from the actual political decision making, however, and commissions frequently set catch limits higher than those suggested by their scientific bodies. Most – though not all – commissions are empowered to make their decisions by supermajority voting, rather than by unanimity. For this reason, most also have an objections process, by which states can choose to opt out of a given regulation if they do so within a specified time period.

These processes combine to allow for rapid changes in regulations that can take account of new scientific information and the potential impacts of previous regulatory decisions. But they also allow for political factors (such as the interests states have in supporting their domestic fishers) to trump scientific ones in the setting of quotas and allow for some member states to occasionally operate outside the regulatory system.

There are important differences across commissions as well. One major difference is whether a commission sets a collective global quota or divides its quotas by state. A global quota, used in many of the earliest commissions like those regulating whales and Pacific tuna, often has the unintended consequence of causing a “race” among states in catching the regulated species, creating an incentive for overcapitalization of fishing vessels (to enable more successful catching). This investment can then make it difficult for fishers to exit the fishery even when fishing is not economically productive because they must repay the loans they took out to get equipment so they could compete for fish.⁶¹

The only geographically global fishery commission regulates the catching of whales – mammals rather than fish, but regulated as a fishery – worldwide. The International Whaling Commission (IWC) was formed in 1946 to ensure the sustainable harvesting of whales to enable “the orderly development of the whaling industry.”⁶² For decades quotas were set higher than the whale population estimates justified, whaling states periodically used a legal “objections” procedure to opt out of regulations they did not wish to implement, a global quota created an incentive for overcapitalization as individual vessels attempted to catch a greater percentage of the quota, and the Soviet Union engaged in systematic state-sponsored noncompliance. Whale stocks were decimated. The commission voted to impose a moratorium on commercial whaling beginning in 1986. This moratorium, still in place, remains controversial. Some whale stocks have recovered and Japan, Iceland, and Norway (the latter two of which lodged continuing objections to the moratorium and so are allowed to conduct commercial whaling under the agreement) attempted for years to garner enough votes to lift the moratorium. Other states argue that stocks have not recovered sufficiently or that whale hunting should not be allowed for ethical reasons. Japan engaged in what was designated “scientific” whaling, which is technically permitted but controversial. The International Court of Justice ruled in 2014 against Japan’s scientific whaling program in the Antarctic, and Japan suspended its whaling program for the following season but resumed in 2016.⁶³ After threatening to do so for years, Japan finally withdrew from the IRCW in 2019 and resumed commercial whaling.⁶⁴

Some commissions focus on a species or a set of related species in a specific geographic range. The most prevalent are regional organizations for the management of tuna and tuna-like species (such as swordfish and billfish). The Inter-American Tropical Tuna Commission (IATTC), created in 1959, addresses tuna management in the Eastern Pacific ocean. It implemented catch quotas until the 1980s when much of its regulatory area was brought within state-controlled EEZs after the signing of UNCLOS. Since then it has continued to conduct research and has set

some rules about catches and has focused on reducing dolphin bycatch in the tuna fishery.

The International Commission for the Conservation of Atlantic Tunas (ICCAT) has regulated the catches of tuna (most prominently bluefin tuna) and tuna-like species in the Atlantic since 1969. Quotas have regularly been set higher than scientists advised, and stocks have generally been declining. Three more recent geographically based tuna commissions are the Indian Ocean Tuna Commission (IOTC), established in 1993; the the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), established in 1994; and the Western and Central Pacific Fisheries Commission (WCPFC), established in 2004. The efforts at collaboration among these tuna-management organizations is discussed in Chapter 7.

There are several organizations to manage salmon as well. This species is subject to regulatory challenges because salmon exist for part of their lifecycle in rivers within state jurisdiction in which the fish are born and return to spawn. The fish therefore have a connection to an individual country. Yet adult salmon travel to the open ocean where they may be caught without regard to their country of origin. In addition to bilateral salmon commissions, not discussed here, the North Atlantic Salmon Conservation Organization (NASCO) and the North Pacific Anadromous Fish Commission (NPAFC) address management of salmon that migrate outside of the EEZs in the geographic areas they regulate. One of the major problems these commissions face, however, is that they are only empowered to set catch limits on the open ocean and can do little to mandate conservation and habitat protection in the locations where the salmon reproduce and mature.⁶⁵ While this limitation is not surprising, given sovereignty concerns, it does limit the potential effectiveness of institutions protecting anadromous fish.

Other RFMOs are organized by geographic region and focus on the myriad fish species within a given region. The Northeast Atlantic Fisheries Commission, the General Fisheries Commission for the Mediterranean, the South-East Atlantic Fisheries Commission (SEAFO), the South Indian Ocean Fisheries Commission (SIOFA), and the Northwest Atlantic Fisheries Organization (NAFO) manage the range of relevant fish stocks in their respective regions. The Helsinki Commission, which governs the environment more broadly in the Baltic Sea area, took over from the International Baltic Sea Fisheries Commission after it ceased operating in 2007.

One such regional commission, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), regulates fishing in the Antarctic waters. When created in 1982, the initial primary concern was potential overharvesting of krill, a species near the bottom of the food chain. Demersal fish species were also severely depleted. The collapse of the Soviet Union decreased the extent of krill harvesting and

other fishing in the region and allowed stocks to recover somewhat. Currently the main species of concern is Patagonian Toothfish, which, in addition to being harvested by member states, is subject to illegal harvesting and fishing by ships registered in non-member states that are thereby not bound by the agreement. The most important regulatory aspect of CCAMLR is its intention to create regulations based on an "ecosystem approach," setting catch limits while taking into consideration the overall functioning and interaction of the ecosystem.⁶⁶ In practice, however, the regulatory process does not look dramatically different than in other fishery commissions.

In addition to these management organizations, there are an even greater number of fisheries organizations that provide scientific research and management advice to member states but do not actually determine fishing regulations. These include such organizations as the Regional Fisheries Advisory Committee for the Southwest Atlantic and the South Pacific Forum Fisheries Agency, among many others.⁶⁷

Yet another group of international fisheries institutions conducts scientific research and provides information internationally but does not give advice about how to manage specific fisheries. Several of these institutions operate under the UN Food and Agriculture Organization. The Advisory Committee on Fishery Research (ACFR), established in 1961, is a small group of experts constituted under the FAO to advise its Director-General on all aspects of fisheries.⁶⁸ The Coordinating Working Party on Fisheries Statistics works with fisheries data gathered across fisheries organizations, disseminates this information, and gives advice on the coordination of data gathering.⁶⁹ Other organizations operate outside of the United Nations. The International Council for the Exploration of the Sea (ICES), founded in 1902, coordinates fishery research in the North Atlantic and adjacent seas. It is headquartered in Denmark and operates through more than 100 working groups and other symposia with the participation of 6000 scientists from more than 350 marine research institutes.⁷⁰ The North Pacific Marine Science Organization (PICES) was created in 1992 to serve as a Pacific version of ICES.⁷¹

The profusion of fishery conservation organizations has some benefits: each organization can focus on the specific needs of the geographic area and species it manages. But the intersection of these institutions causes problems as well. Conservation measures passed in one RFMO can affect fishing behavior in other places. Those fishing for one species in a given geographic area, for example, may move to a different ocean during closed seasons or when they have reached their quota. One of the causes of overfishing in the Atlantic tuna fishery in the 1970s was the increasingly strict regulation in the Pacific tuna fishery, after which Pacific fishing vessels chose to fish in the Atlantic instead.⁷² Fisheries commissions have begun to coordinate some of their measures with these behaviors in mind.

UNCLOS also affects in several ways the regulation of high-seas fisheries and the institutions that govern them. First, it changed the rules on what constituted the high seas. Though some, principally Latin American, states had unilaterally declared management authority (or even outright ownership) of the sea hundreds of miles from their coastlines beginning in the 1950s, this principle was contested internationally and not adopted in a uniform format. UNCLOS endorsed the idea of an "exclusive economic zone," extending 200 miles from the coastline of a state. In this area states could not prevent innocent passage of ships, but they did gain the legal ability unilaterally to manage the natural resources found there. Since up to 95% of ocean fish caught are found within 200 miles of coasts,⁷³ this change had a major impact on fisheries management (though many of the largest and highest-value fish are nevertheless found in the high seas).

Several different effects were generated by this major change. The first was the impact on fisheries themselves. One underlying argument in favor of this change from a management perspective was that it would essentially privatize the management of certain parts of the ocean; if states had unilateral control over resources there, they would gain an incentive to manage these resources well. Most commentators, however, regard the period immediately after the creation of EEZs as disastrous for fisheries management. What happened?

The response by many state governments when given control of this new expanse of marine wealth was to exploit it as fully as possible. Governments subsidized the building of more ships and created other incentives to bring their citizens into the fishing industry. At the same time, the new EEZ system replaced one version of the tragedy of the commons on the international scale with a similar structure domestically. What had previously been individual fishers from multiple countries competing for the same fish stock became multiple individuals licensed by one country competing for the same fish stock. The same incentive to use expensive technology to increase efficiency, combined with domestic subsidies in many states, created an overcapitalized domestic fishery within most EEZs and dramatic depletion of fisheries within EEZs.⁷⁴

The second type of impact from the creation of EEZs was on the institutions that governed international fisheries. Most had been created to govern fish caught anywhere with the occasional exception of the (quite small) territorial sea. After UNCLOS, states with large EEZs demanded their right to make use of these resources and to determine the conditions under which others could. A number of long-standing fisheries management institutions had to be renegotiated to take account of the new international rules.⁷⁵

In some cases, the terms of reference of a given institution were simply revised to allow for states to determine fishing practices within their EEZs.

Some of the fisheries organizations – the Inter-American Tropical Tuna Commission and the North East Atlantic Fisheries Commission – remained in effect but changed their rules to reflect this new jurisdiction. In other cases, fisheries organizations simply ceased to exist and new ones were created in their place. What had been the International Commission for North-west Atlantic Fisheries was replaced by the Northwest Atlantic Fisheries Organization (NAFO), for example.

The third implication of EEZs for fishery management involved those fish species that crossed among EEZs or between EEZs and the high seas. UNCLOS directed states with “straddling stocks” in their EEZs to cooperate with each other, and through the relevant regional fishery management organizations, to manage them.⁷⁶ This cooperation was generally lacking, however. The regional fisheries management organizations in their post-UNCLOS incarnations officially abdicated responsibility for fish inside EEZs, and states both inside and outside of these organizations resisted efforts to manage straddling stocks.⁷⁷ Agenda 21 from the 1992 United Nations Conference on Environment and Development had called for an international conference on straddling and highly migratory stocks, and in December 1992 the United Nations General Assembly officially approved the convening of a UN conference on the topic.⁷⁸ The conference met in a number of sessions from 1993 to 1995. During this time some states took unilateral action: Canada, for example, shot warning shots at Spanish vessels taking turbot in NAFO-managed waters just outside of Canada’s EEZ, though Spain had taken pains to conform its turbot fishing to the letter (if not the spirit) of the NAFO regulations.⁷⁹ The aftermath of the “Turbot War,” as it was called, added to the growing call for international agreement to address the issue of straddling stocks.

When the UN conference began in 1993, it was not yet clear whether it would result in a legally binding international agreement or simply a declaration of principles. There was strong sentiment, especially after the Turbot War, in favor of a binding agreement. The result was the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995). This instrument, sometimes referred to as the UN Fish Stocks Agreement, does not itself provide the management for straddling stocks but rather elaborates on the obligations under UNCLOS for states to cooperate to manage such species. All states that have an interest in a given fishery pertaining to these stocks must join existing fishery management organizations (or work to create them where none exist) or must agree to comply with the regulations of these organizations whether or not they are members. There are similar provisions authorizing enforcement of RFMO provisions.⁸⁰ This agreement entered into force in December 2001. It has been formally reviewed within the UN process several times, most recently

in 2023; this review found uneven implementation of the agreement and noted the decline of many of the species it is meant to protect.⁸¹

The overall success of international institutional efforts to conserve ocean fisheries has been low. The FAO estimates that as of 2019, 35.4% of fish stocks are fished at “biologically unsustainable levels,” and that another 57.3% of stocks are fished at maximally sustainable fishing levels, meaning that they can sustain no more fishing effort than they are already experiencing.⁸² A controversial study from 2003 found that, worldwide, populations of large predatory fishes (those, like tuna and swordfish, that are the subject of international management efforts) were at 10% of the levels they were before industrial exploitation.⁸³ Atlantic cod, pollack, halibut, and salmon are nearly commercially extinct, and at least nine of 16 Pacific fish stocks are deemed to be overfished.⁸⁴

Fishery conservation organizations face consistent difficulties in their efforts to manage fishing of these stocks. Most fishery commissions regularly set their catch limits above those recommended by their scientific bodies. Politically, this disconnect is not surprising: decisions in fishery commissions are made by the member states whose domestic fishing industries will suffer in the short term if not able to continue their level of fishing. Any uncertainty in the scientific estimates or causes of fish declines increases the pressure to not take drastic action to cut fishing quotas. Noncompliance with fishery rules is reasonably easy to accomplish because it is difficult to detect. Additionally, an increasing amount of fishing is being conducted under flags of convenience. One estimate suggests that of the refrigerated fishing vessels most involved in large-scale high seas fishing and transshipment of fish, nearly half are registered in flags of convenience.⁸⁵

Bycatch is an increasingly large problem as well that has only recently been addressed in fishery institutions. A 2009 estimate suggested that 40.4% of marine fish catch was composed of species that are not sought and are often simply discarded.⁸⁶ Fishery regulations can, themselves, increase the incentives for bycatch; when catches are limited there is an incentive to “high-grade,” or catch the best quality of the limited number of fish allowed, with smaller or lower quality fish thrown back, unlikely to survive. The segmentation of many fishery management institutions by species also means that those seeking one type of fish may not account for the additional species they catch in their efforts to seek the desired fish. But many RFMOs have included bycatch regulations in the last decade or two.

Conclusions

The ocean commons is particularly difficult to manage. It is hard to monitor what is done in this vast and often unfriendly space, owned by no state, and far from view. Given this difficulty, international institutions

managing maritime issues have done a surprisingly effective job of changing the way ships are built and operated. The IMO has overseen a wide range of international agreements that have led to increased safety on and decreased pollution from ships.

Many of the institutions created under the Law of the Sea are still recent and evolving, but have, for those states that accept their mandates, shown some sign of effective governance. At minimum, they have changed the way the oceans are governed internationally. How well they fare over time, and whether UNCLOS can help remedy some of the difficulties with maritime governance, remains to be seen. The new BBNJ treaty has given many scholars reasons for optimism.

Institutions protecting fisheries have had the most difficulty gaining the participation of relevant actors and persuading states to accept strict limits on their fishing. In the face of uncertainty over stock estimates, causes of declines, and the behavior of others, it can be difficult to accept certain current restrictions for the sake of uncertain future benefits. The many different regional fishery management organizations have varied levels of success in protecting the stocks they manage, but have, over time, evolved strategies for better managing the behavior of fishers. The protection of the oceans will remain a difficult institutional challenge.

Notes

- 1 OECD, "The Ocean," 2023, <https://www.oecd.org/ocean/topics/ocean-shipping/>.
- 2 Eula McDonald, "A Half Century of Developments in Ocean Shipping," *Towards a World Maritime Organization* (United States Department of State, Publication 3196, 1948), 1.
- 3 Comité Maritime International, "History," <http://www.comitemaritime.org/histo/his.html>.
- 4 Treaty of Versailles (1919), Article 379.
- 5 McDonald, "A Half Century of Developments," 5.
- 6 McDonald, "A Half Century of Developments," 5–11.
- 7 Cleopatra Elmira Henry, *The Carriage of Dangerous Goods by Sea: The Role of the International Maritime Organization in International Legislation* (London: Frances Pinter Publishers, 1985), 39.
- 8 Convention of the International Maritime Consultative Organization Articles 6 and 8.
- 9 IMO, "Member States," 2023, <https://www.imo.org/en/OurWork/ERO/Pages/MemberStates.aspx>.
- 10 This was accomplished by Resolution a.400 (X) of 17 November 1977. Henry, 43.
- 11 These began as subcommittees but were promoted between 1975 and 1977 to subsidiary bodies of the organization. Henry, *The Carriage of Dangerous Goods by Sea*, 44.
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5 Atmospheric Commons

The institutions addressing atmospheric commons are all reasonably recent, but quite well developed. There are compelling reasons for international approaches to addressing these issues. The atmosphere is not controlled by any one state, and actions taken by states in one location affect the atmosphere in other locations. States thus cannot protect their own populations from environmental problems of the atmosphere simply by controlling their own domestic behavior.

These problems can be dramatic. Acid rain has caused damage to forests, lake ecosystems, and human health across Europe and North America and has been more recently emerging as a serious problem in rapidly industrializing areas in Asia and Latin America. A depleted ozone layer leads to increases in skin cancer, cataracts, and immune system disorders among humans and other species, and damages plant and animal life and agricultural and oceanic productivity. The threats from climate change are dramatic and potentially catastrophic. Rising sea levels will inundate populated areas inhabited by millions of people, and changing patterns of temperature and rainfall will affect food production, disease vectors, and affect the health or even survival of species or ecosystems. Already, the World Health Organization estimates that 250,000 lives will be lost annually from 2030–2050 as a result of the effects of climate change.¹

In some cases, such as acid rain and other forms of transboundary air pollution, the effects are directional: where a state lies in the atmospheric currents determines the environmental effects it will have on, or receive from, others. But in other cases, such as ozone depletion and climate change, the impacts do not depend on the location of the emissions. In this kind of pollution problem the atmosphere acts as a true commons, and the need for all potential sources of emissions to be controlled to address these problems influences the characteristics of the institutional rules and processes developed to address them.

This chapter discusses the institutions created to address three major problems of the atmospheric commons. Transboundary acid rain has been the focus of regional institutions, most prominently the Convention

on Long-Range Transboundary Air Pollution, focusing on Europe and coordinated through the United Nations Economic Commission for Europe, although regional institutions are emerging in other areas. The process created by the Vienna Convention and Montreal Protocol govern what is widely believed to be one of the most effective efforts at international environmental cooperation, addressing the protection of the ozone layer. Climate change has proven to be a more difficult institutional challenge, initially coordinated globally via the United Nations Framework Convention on Climate Change and its Kyoto Protocol, and most recently through an agreement negotiated in Paris in 2015.

Long-Range Transboundary Air Pollution

Acid rain was the earliest issue of the atmosphere to be addressed through international cooperation. It only became an international problem because of earlier domestic efforts to avoid local impacts of power generation. Industry actors built or local officials mandated high smokestacks on power plants and other coal-burning facilities to put emissions higher into the air so that they would not fall locally and affect ecosystems near the facilities producing the emissions. This technological approach had the effect of dispersing the pollutants away from the location from which they were generated, sometimes sufficiently long distances that they crossed international borders.²

The problem of acid rain was a precursor to the Stockholm Conference in 1972 (see Chapter 2). At the time, Scandinavian states were concerned about problems of acid rain, since they were feeling its effects; Sweden in particular raised the idea of a UN conference to address issues of the human interaction with the environment. Though the conference did not directly address acid rain, its declaration and action plan included items relevant to, and inspired by, the problem. For instance, Recommendations 72 and 73 of the action plan address the need to limit emissions of pollutants that cross international borders and to assess these pollutants, their pathways, and their effects.³

Convention on Long-Range Transboundary Air Pollution

While Stockholm did not deal directly with acid rain, another opportunity to address the issue arose. In the mid-1970s the Soviet Union, at the height of the Cold War, proposed negotiation on a “low politics” issue as a way to encourage cooperation, and thus further détente, between East and West. The idea was that if states could cooperate on issues not related to security it might lower tensions more generally. The United Nations Economic Commission for Europe was charged with finding such an issue

on which to negotiate, and suggested the possibility of environmental cooperation, specifically acid rain.⁴

International cooperation on acid rain faced a set of then-common circumstances for international environmental cooperation. People had observed a problem and its effects – lakes in Scandinavia and elsewhere were becoming acidified – but did not have a clear understanding of the causes. At the time the most affected states believed that this acidification was due to transport of sulfur dioxide emissions from elsewhere in Europe, but the idea that these substances could travel such long distances received much skepticism. In 1977 a report by the Organization for Economic Cooperation and Development (OECD) argued that long-range transport of acidifying substances was likely,⁵ supporting earlier studies from the 1960s suggesting that it was possible.

Negotiation of the agreement took place in a highly politicized Cold War context, yet the primary disagreements in the negotiation were between the Nordic states, which wanted binding international commitments to reduce acidifying pollution, and the western European states, which were not especially concerned with the problem and resisted changing their behavior.

The resulting cooperative structure presaged the form of later cooperation on atmospheric issues and other environmental problems about which there was uncertainty and disagreement. The Convention on Long-Range Transboundary Air Pollution (CLRTAP) was a broad framework convention that established the basis for and form of cooperation without requiring much in the way of substantive mitigation of the problem. States agreed in principle to limit the emissions of acidifying substances in an economically feasible way.⁶ Because of the broader Cold War context, and because they are members of the UNECE, both the United States and Canada joined CLRTAP.

Most importantly, CLRTAP sets up the scientific framework for a better understanding of the environmental problem, its causes, and the extent of its effects. States are required to collect and submit data on their emissions of air pollutants (initially with sulfur dioxide but expanded to other pollutants). The Executive Body dictates the format of these data reports, which harmonizes the research and information collected under CLRTAP. Because states had to begin collecting this kind of information, those that previously did not have research capacity gained the incentive to develop it.⁷ In addition, states must cooperate on research about potential air pollutants, monitoring, and models for evaluating the levels and impacts of air pollutants, and the effects of emissions of these pollutants on the environment and on human health.

The parties also agreed to implement and further develop an international monitoring program, the Cooperative Program for Monitoring and Evaluation of Long-Range Transmission of Air Pollutants in Europe

(referred to as EMEP), to monitor emissions and transboundary movements of sulfur dioxide and related substances, as well as their effects on ecosystems. Following a 1984 Protocol to CLRTAP, this program came to be financed by mandatory contributions from member states based on wealth, population, and other geographic considerations. EMEP was originally formed by the OECD in 1978 (from a network of monitoring stations created earlier in the 1970s) but was brought under CLRTAP after the 1979 convention. The program runs 352 monitoring stations in more than 40 countries, from which it measures pollution levels;⁸ states also submit emissions reports to EMEP. It then makes use of meteorological data from the World Meteorological Organization (WMO) to create emissions trajectories. This allows calculation of where a given state's emissions go.

EMEP's data gathering gives it the ability to monitor compliance with the agreement, since it can compare information given about emissions with measurement of air pollutants in the direction it knows the emissions travel. Though the CLRTAP secretariat does not emphasize this aspect, it may be responsible for the high level of confidence placed in the self-reported emissions data.⁹

Other monitoring and research take place within the CLRTAP structure. The Working Group on Effects oversees a set of International Cooperative Programs (ICPs) assessing impacts on natural resources. Current ICPs focus on forests, waters, materials, and vegetation, as well as integrated monitoring and modeling and mapping. There is also a Task Force on Health as a part of the Working Group on Effects.

Under the agreement, the UN Economic Commission for Europe (UNECE), and specifically its Air Pollution Unit, became the secretariat for the organization created. The actual staffing of the secretariat is minimal despite growth in the number of regulations and parties to the convention.¹⁰ The parties to the agreement constitute the Executive Body, the decision-making body for the cooperative process, which meets annually. The Executive Body has established a number of subsidiary working groups (most prominently the Working Group on Effects, the Working Group on Strategies and Review, and the EMEP Steering Body) that manage collective research and work to draft protocols. The Executive Body makes decisions by consensus, on such issues as establishing task forces and extra groups, asking for more information from parties or following up on noncompliance or facilitating compliance. These decisions are not considered to be legally binding, however, so the primary substantive changes to behavior come through the negotiation of protocols to the convention.

The agreement is intended to be regional, only open to member states of, or with consultative status to, the Economic Commission for Europe. Though some states have been reluctant to take on later commitments, all the negotiating states quickly signed and ratified the 1979 agreement.

The process of monitoring and coordination institutionalized by CLRTAP provided the main impetus for further negotiations of substantive protocols that mandated specific action to reduce the problem of air pollution. A number of states were reluctant participants in initial CLRTAP negotiations because they did not believe their emissions could be causing problems or did not believe that they faced problems themselves from acid rain. Data collected in research processes set up or supported by CLRTAP began to demonstrate the extent of the environmental impacts. Information presented at a 1982 conference in Stockholm indicated the degree of lake and forest acidification, including the extent of forest death in Germany's famed Black Forest. Germany shortly thereafter became a proponent of binding emissions reductions.¹¹ Since Germany had previously been strongly opposed to binding measures for emissions control, this shift proved pivotal in allowing for the negotiation of binding protocols. It is through these protocols that CLRTAP's regulatory efforts are implemented. There are currently seven protocols that require specific emissions reductions, along with a 1984 protocol to finance EMEP.

The first abatement protocol is the 1985 Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent, which entered into force in 1987. It is currently referred to as the First Sulphur Protocol. Because acid rain is a directional issue, the idea of states each reducing their emissions by the same amount regardless of where they are situated in the atmospheric currents does not make environmental sense, but from a negotiation standpoint it proved easier for all states to agree to the same reduction level. The ideological pressure to accept emissions reductions, what Marc Levy called "tote-board diplomacy," came from the "30%" club of states that committed to reducing their emissions before a specific obligation to do so existed. By 1984, a sufficient number of states had agreed to do so that a protocol could be concluded. The Soviet bloc, however, resisted a requirement for domestic action and instead insisted that the option be included that states reduce the "transboundary fluxes" of pollutants by that amount instead. In the case of the Soviet Union, this requirement was met not by reducing emissions generally, but rather by changing the location of sulfur-emitting facilities so that their pollutants would no longer cross international borders.¹²

The 1988 Protocol Concerning the Control of Nitrogen Oxides or Their Transboundary Fluxes entered into force in 1991. It first required that states freeze emissions of nitrogen oxides (or their transboundary fluxes) at 1987 levels. It also required that states negotiate further reductions in nitrogen oxide emissions based on where cuts will have the greatest environmental impact.¹³

The 1991 Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes entered into force

in 1997. Volatile organic compounds (VOCs) are a major precursor to the creation of ground-level ozone, which has respiratory and other environmental effects. This protocol allows states to choose from three different reduction obligations at the time of signature or ratification. The first option is to achieve a 30% reduction of VOCs (from a base year chosen between 1984 and 1990) by 1999. The second option allows for the reduction by 30% of VOC emissions within a specified Tropospheric Ozone Management Area (and provided that total VOC emissions in 1999 do not exceed those in 1988). The third option is for states whose emissions in 1988 were below a specified level (figured in amount, determined by capita and per square kilometer); they may simply choose to stabilize their emissions by 1999 at 1988 levels.¹⁴ Though Bulgaria, Greece, and Hungary had emissions low enough and chose the third option and Norway and Canada chose the second option, most states selected on the first option for reductions.¹⁵

A radical shift in the CLRTAP approach came with the 1994 Protocol on Further Reductions of Sulphur Emissions (often referred to as the second Sulphur Protocol), which entered into force in 1998. Unlike previous protocols that mandated identical emissions reductions obligations for all parties, this protocol attempts to implement the concept of “critical loads” as a guiding framework for determining reductions. Because of differing air flow patterns and geographic locations, not all states contribute or receive the same amount of air pollutants. In addition, the natural characteristics of the ecosystems where pollutants are deposited – for instance, whether they have natural buffering capabilities – influence what kind of effect the pollutants that do fall will have. UNECE officials endorsed the idea that emissions should be regulated such that no state receives emissions that exceed a “critical load” of the regulated substance defined as “an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur, according to present knowledge.” This protocol is an imperfect implementation of the idea of critical loads; it contains a number of provisions that limit the extent to which this approach is followed. First, it indicates that these obligations are to be implemented “as far as possible, without entailing excessive costs.”¹⁶ The actual reduction obligations laid out in an Annex are generally regarded as representing a compromise between environmental requirements and what states were actually willing to accept in terms of obligations.¹⁷ But it provides an important conceptual advance in linking abatement obligations by states to actual environmental necessities on the ground.

Additional protocols to CLRTAP expand the agreement’s purview; they address pollutants with long-range transport but that are not the acidifying substances that provided the initial focus for the agreement. Two 1998 protocols entered into force in 2003. The Protocol on Heavy Metals

initially required parties to reduce their emissions of cadmium, lead, and mercury below the level of emissions of 1990 (though parties had the option to choose an alternate base year between 1985 and 1995). It also gave specific emissions limits from stationary sources and required that states cease the use of lead in gasoline. These controls were made more stringent in 2012 amendments, which entered into force in 2022.¹⁸ Mercury is also regulated in the Minamata Convention, discussed in Chapter 6.

The Protocol on Persistent Organic Pollutants (discussed further in Chapter 6) created an initial list of 16 substances (including pesticides, industrial chemicals, and other contaminants), with a goal of eliminating emissions of these substances. Of those on the list, some are banned entirely, others are scheduled for later elimination, and the use of some are restricted. Additional substances were added (for a total of 23) and restrictions on already-regulated substances made more stringent in 2009 amendments that entered into force in 2022.¹⁹

Finally, the 1999 Protocol to Abate Acidification, Eutrophication and Ground Level Ozone entered into force in 2005. This agreement requires further action on pollutants addressed in earlier protocols, creating a ceiling for emissions of sulfur, nitrogen oxides, volatile organic compounds, and ammonia, bringing together the multiple pollutants that collectively create acid rain and related pollution problems into one regulatory mechanism. The levels of emissions of the substances by states are determined (as in the second sulfur protocol) in a way that takes into account where the emissions have the greatest impact and where the least expensive reductions can be made. In addition, the protocol sets limits for emissions from specific sources (such as power plants and automobiles) and requires the use of “best available techniques” of emission control.

The original protocol required emissions reductions relative to 1990 levels of sulphur dioxide (SO₂), nitrogen oxides, ammonia, and volatile organic compounds. It was amended in 2012 to, among other things, include emissions of fine particulate matter (PM_{2.5}), including black carbon (also known as soot). The 2012 obligations, which entered into force in 2019, require EU member states collectively to reduce emissions of SO₂ by 59%, nitrogen oxides (NO_x) by 42%, ammonia by 6%, volatile organic compounds by 28%, and PM_{2.5} by 22% by 2020 and beyond, though the specific obligations of individual parties vary based on environmental conditions and emissions profiles; the obligations of other states vary as well.

It is also important to note the role of one nongovernmental organization within the operating process of CLRTAP. The International Institute for Applied Systems Analysis (IIASA) is a cooperative scientific institute set up in 1972 by nongovernmental science organizations from both Eastern and Western Europe (along with the United States), with support of the governments of these states. Its focus is on creating and disseminating models and management techniques. One of its research

areas has been acid rain, and it created a simulation known as RAINS (an extension of which, pertaining to climate change, is called GAINS) that evaluates environmental benefits and economic costs of various air pollution control strategies. IIASA has been involved in CLRTAP negotiations and decision making from the beginning but has had particular influence in the development and adoption of the “critical loads” concept, which can be modeled under RAINS. IIASA has expanded its contribution to broader issues of atmospheric pollution, modeling air pollution for EU clean air policy and working with UNEP to help assess the effectiveness of climate change regulations and the IPCC to evaluate climate scenarios.

Since CLRTAP was negotiated and its various institutional structures made operational, the change in emissions has been dramatic. European SO₂ emissions fell from a high of 62 mt/yr in 1980 to 10 mt/yr in 2020. NO_x emissions fell from a high of approximately 32 mt/yr in 1985 to about 12.5 mt/yr in 2020.²⁰

Not all of this changed behavior is traceable to the convention and its institutional process. Emissions of SO₂ in the UK decreased as that country changed from coal to gas as a major energy source, for reasons unrelated to CLRTAP obligations. Emissions in Eastern Europe decreased with the economic and industrial changes brought on by the disintegration of the Soviet Union. Nevertheless, the behavior of some states in Europe has been changed by the existence of CLRTAP, particularly such states as Germany that learned of their vulnerability from studies undertaken in the context of CLRTAP.²¹

The environment has benefitted from these decreased emissions. The area of Europe that receives acid deposition beyond what the environment can buffer decreased from 43% to 7% by 2010 with further decreases anticipated;²² the areas of Europe where acid deposition exceeds critical loads is expected to all but disappear by 2030, though eutrophication effects will decrease more slowly.²³

Transboundary Air Pollution Elsewhere

At least in part because the majority of the transport of acidifying substances takes place on the scale of hundreds of kilometers, the international cooperative efforts to address them have largely been regional. The European arrangement is the most institutionally developed and has made the biggest difference in changing the emissions behavior of its member states, but there are arrangements either existing or in the process of being created in other regions.

The most developed of these other acid rain arrangements is in North America. This agreement is not considered at length here because it is bilateral and not highly institutionalized. Though both the United States

and Canada are parties to CLRTAP, they created, after much political disagreement, what became the United States–Canada Air Quality Agreement (1991). The agreement contains a set of general obligations to “reduce transboundary flows of ... acidic deposition precursors”²⁴ and to engage in environmental impact assessment, prior notification, mitigation, and a process of cooperative or coordinated scientific, technical, and economic research. In an annex the United States and Canada agree to specific – and separate – emissions reductions for SO₂ and NO_x.

Among other measures, Canada agreed to reduce SO₂ emissions in the seven eastern provinces to 2.3 million tonnes per year by 1994, to maintain that level through 1999 and to not exceed a permanent annual cap of 3.2 million tonnes any time after 2000. The United States agreed to reduce SO₂ emissions to 10 million tons below 1980 levels by 2000 and to reduce nitrogen oxide emissions to 2 million tons below 1980 levels by 2000.²⁵ There are a variety of requirements for fuel efficiency standards and other technological requirements as well. In 2000, the Ozone Annex was added to the agreement, which commits the two nations to reduce emissions of nitrogen oxides (NO_x) and VOCs, the precursor pollutants to ground level ozone, which forms a major component of smog. Both the United States and Canada have broadly followed the requirements of the agreement and have exceeded the required emissions reductions considerably.²⁶ The United States would have been required to meet these obligations by its own domestic Clean Air Act amendments that passed before the Air Quality Agreement was signed.

Institutionally the US–Canada agreement relies on an existing structure, the International Joint Commission (IJC), which was formed under the Boundary Waters treaty between the two states in 1909. The IJC coordinates public comments on air quality. The agreement also created a bilateral Air Quality Committee to review the implementation of the agreement; it also provides a progress report and a record of public comment every two years. There is no specific institutional process for changing obligations under the agreement.

With increasing industrialization elsewhere in the world, problems of acid deposition have emerged as well. Though not entirely new in Asia, the problem has become more acute in recent times. Transboundary acid rain in northern Asia is primarily due to Chinese coal-burning, and to a lesser extent transportation, though South Korean emissions also move eastward through the region. At a regulatory level, states have thus far primarily focused on national approaches. Japan addressed acid rain domestically with strong controls on emissions from power generation and automobiles but acknowledged that these efforts could not prevent impacts from emissions from elsewhere. South Korea and China have lagged on domestic regulation of emissions of air pollutants, though both have some control measures in place. For China, the context of increasing industrialization and the costliness of control measures means that emissions from coal burning nevertheless continue to increase, especially in the southeastern part of the country.²⁷

At this point the major efforts undertaken have been to monitor air pollutants and ecosystemic effects. The most important of these is the East Asian Acid Deposition Monitoring Network (EANET), which began operations in 2001. Though Japan initially proposed the creation of this network, it now involves states throughout East Asia. It includes a secretariat (housed in UNEP's Regional Office for Asia and the Pacific), a Scientific Advisory Group, and National Focal Points within participating countries.²⁸ EANET has worked to standardize acid rain monitoring in the region – no small task, given that each member state has its own techniques for monitoring and analysis. It has enabled the critical loads approach to be applied in the region. Most importantly, the monitoring information has been made publicly available in recent years.²⁹

One of the goals of the organization is to work for the reduction of regional SO₂ emissions, though such an effort will likely face political difficulties. Little pre-existing political cooperation among states in the region, alongside high-level conflicts over territorial sovereignty and other political issues, makes the collective negotiation of shared obligations difficult. Some see this phenomenon as part of a broader reluctance toward binding cooperation in the region.³⁰ The incentive for regulatory cooperation on this issue is not strong. China is deeply affected by its own emissions but gains little advantage from international obligations to reduce. The wealthiest states, Japan and South Korea, are less ecologically vulnerable to damages from acidification due to the natural buffering ability of their soils,³¹ and though they are not the primary causes of emissions, they would likely be seen as a source for funding emissions reductions activity. These states fear the economic downsides of international cooperation to address a problem they do not yet experience as severe.³²

In the meantime, the reach of acid rain increases with the global expansion of industrialization. South America is starting to feel the effects of acid rain, though there is little institutional effort, especially at the regional level, to address it. It is also now understood that some of these pollutants can travel longer distances than previously understood; Chinese air pollutants are reaching the west coast of the United States and forest fires on the African continent are affecting air quality as far away as Guam.³³ The regional focus of international efforts to address this type of pollution will make it more difficult to prevent acid rain and other air pollution effects from pollutants that cross regions.

Ozone Depletion

The most widely heralded institutional process for addressing an international environmental problem is that pertaining to ozone depletion. The Montreal Protocol process has fundamentally changed the worldwide use of a set of environmentally damaging chemicals, leading to initial signs of environmental improvement. It has done so in a way that brought all

relevant states into the control processes and provided assistance for developing states to meet the obligations of the underlying international agreements. As of 2009, this set of agreements had been ratified by all member states of the United Nations, the first treaties in the history of the UN to achieve this status.³⁴

Ozone depletion is the destruction of molecules of ozone in the stratosphere that provide protection to the earth from harmful ultraviolet radiation. The primary chemicals initially identified as problematic, chlorofluorocarbons (CFCs) and halons, were important industrial chemicals used as aerosol propellants and in refrigeration, cleaning of electronics, and fire suppression. The problem of ozone depletion created a new set of difficulties for the creation of a regulatory institution. In previous environmental problems, like acid rain, an effect was observed and then causes for that effect ascertained, and regulations created to address those causes. In the case of ozone depletion the impact was theorized before it was observed, leading to potential difficulties in gaining international cooperation to regulate industrial behavior for which a problematic outcome had not yet been observed. The long atmospheric life of these substances – the most common CFC lasts for 100 years, and some can persist for up to 1700 years³⁵ – meant that waiting for clear signs of environmental damage would extend the period of environmental degradation. States agreed to cooperate in anticipation of the problem.

Vienna Convention for the Protection of the Ozone Layer

Initial international efforts on this issue began in the 1970s, led by the United Nations Environment Programme (UNEP). UNEP convened a conference of experts in 1977 to adopt a World Plan of Action on the Ozone Layer, encouraging international cooperation in research and modeling on causes, effects, and trends in ozone depletion that would be undertaken by the United Nations and other international organizations, states, and nongovernmental organizations. This meeting also established a Coordinating Committee on the Ozone Layer (CCOL) to help oversee this research. This committee met regularly until 1985 and issued reports summarizing the state of knowledge on ozone depletion.³⁶

Prior to international negotiations some states had taken domestic action to limit their use of CFCs. Most notable among these was the United States, which passed rules in 1977 phasing out the use of CFCs in nonessential aerosols; even prior to these rules the consumption of these substances in the United States had fallen dramatically, because of public environmental concern.³⁷ The US action alone cut worldwide consumption of CFCs by approximately 25%.³⁸ Sweden and Norway undertook similar action, and Canada forbade the use of CFCs in most aerosols.

In 1981 the UNEP Governing Council passed a motion presented by Sweden to authorize negotiations toward a binding international agreement on the protection of the ozone layer and established a working group (to coordinate with the CCOL) to begin this process. International concern about the potential problem was not uniform, however, and the decrease in worldwide consumption of CFCs further decreased pressure for an international agreement. Countries that had controlled their own domestic consumption of CFCs generally proposed international measures that mirrored what they had already taken on, and those that had not yet passed domestic rules were reluctant to take on international obligations. The "Toronto Group" – Canada, the United States, Australia, Switzerland, and the Nordic Countries – together proposed a set of measures that would allow states to choose which form of reductions to take. These measures were opposed by the European Community and Japan, which resisted taking action. Industrial manufacturers and users of CFCs also opposed international action and warned that international controls would be costly and disruptive of industry, while others pointed to the continuing uncertainty about the scope or magnitude of a potential problem that had not yet made itself apparent.

Because of these continuing disagreements, the working group conceded that the only form of international agreement possible at the time would be a framework convention, without binding emissions reduction obligations. The resulting agreement was the Vienna Convention for the Protection of the Ozone Layer (1985), which entered into force in 1988. The Vienna Convention included the obligation by states to take "appropriate" action to protect the ozone layer, to cooperate in scientific research, and to exchange information. It established an important process of scientific cooperation to address concerns by reluctant states that the limited knowledge on ozone depletion did not justify strict emissions controls. Institutionally, the agreement established the Conference of the Parties as its decision-making body and designated UNEP as the organization's secretariat.

Montreal Protocol on Substances That Deplete the Ozone Layer

The possible elaboration of abatement obligations was left to the negotiation of future protocols. But as a compromise for dropping insistence on control measures within the Vienna Convention, the negotiators agreed to a resolution to immediately convene a working group to begin negotiations for a protocol, with an aim to complete it by 1987.³⁹ Official negotiations began in 1986, with the negotiating positions reflecting those taken in the negotiation of the Vienna Convention. One major change, however, was that US producers of CFCs dropped their opposition to international

measures because they feared stronger domestic action if international control of ozone-depleting substances was not undertaken and because they hoped to be able to develop alternative chemicals if international controls created a sufficient market incentive.

Negotiations continued through 1987. The major points of contention involved whether the controls would be on production or consumption of ozone-depleting substances and how deep these cuts would be. UNEP convened a conference of atmospheric modelers, who demonstrated that under any of the proposed plans notable ozone depletion would still occur. UNEP Executive Director Mostafa Tolba participated in the discussions in an effort to persuade states that current scientific knowledge pointed to the necessity for action. A number of scientific assessments during this period, especially those sponsored by the US National Aeronautics and Space Administration (NASA) in 1984 and 1985, were influential in developing scientific consensus for action.⁴⁰ The discovery in 1985 of what came to be known as the "ozone hole," a seasonal thinning in the ozone layer above Antarctica, provided additional impetus to conclude an agreement, though human responsibility for this phenomenon had not yet been ascertained. An eventual agreement was reached just before the original deadline imposed by the conference of the plenipotentiaries already scheduled for September.⁴¹ To enter into force, the Protocol required ratification by at least eleven states that collectively represented at least two-thirds of global CFC consumption. It entered into force in January 1989.

The document on which the negotiators agreed was the Montreal Protocol on Substances that Deplete the Ozone Layer (1987). It required that parties freeze consumption (defined as "production plus imports minus exports")⁴² of five specified CFCs at 1986 levels by 1990, and then reduce their use by 20% by 1994 and 50% below 1986 by 1999. States also agreed to freeze consumption of three halons at 1986 levels by 1993.⁴³ The Protocol uses a system of calculating a substance's "ozone depletion potential" (ODP), which is an assessment of how much damage a given substance can do to the ozone layer; this regulatory decision allowed for the comparison of different substances in regulatory measures.

Important exceptions to these rules were created for developing states (as defined in the UN system) whose per capita consumption of ozone-depleting substances was less than .3 kg. These states had an additional ten years in which to meet the protocol's obligation and could even increase their consumption during that period as long as it did not exceed .3 kg/capita. In order to persuade states to join the agreement, especially those states that did not yet produce their own CFCs, the Montreal Protocol mandated that states party to the agreement could only trade ozone-depleting substances with other parties.

Institutionally, the main decision-making mechanism in the Montreal Protocol is the annual Meeting of the Parties (MOP), which operates alongside the COP to the Vienna Convention, though in practice the major decisions are made in the MOP. All states to the agreement are represented, with one vote each. The MOP has oversight responsibility for all of the activities that take place under the Protocol. It approves the budget and activities of the Ozone Secretariat, and adopts decisions on issues pertaining to compliance, implementation, and review of the agreement.

The subsidiary bodies of the Montreal Protocol are also important parts of the broader institutional structure. The current structure involves a Technology and Economic Assessment Panel (TEAP), a Scientific Assessment Panel (SAP) and an Environmental Effects Assessment Panel (EEAP).⁴⁴ The MOP also established an Open-Ended Working Group (OEWG) that meets between MOP meetings.

The secretariat functions for the Montreal Protocol have been folded into those for the Vienna Convention; the Ozone Secretariat, run by UNEP, is housed in UNEP headquarters in Nairobi, Kenya. The Secretariat has played a particularly active role in assisting the implementation of the Montreal Protocol and the negotiation and implementation of its amendments. It also prepares a report on the implementation of the agreement for each Meeting of the Parties.

The most important function of this organization is to decide on amendments and adjustments to the Protocol. Major changes in Protocol obligations can be negotiated through amendments to the Protocol. These require negotiation, signature, and ratification and are used to significantly alter the phaseout schedule or to add new controlled substances to the obligations. The first set of amendments were negotiated in London in 1990, which took the important step of requiring the eventual complete phaseout of CFCs and some halons, when previously only a reduction had been mandated. The timeline for reductions was also accelerated. Amendments in Copenhagen in 1992 added hydrochlorofluorocarbons (HCFCs), hydrobromofluorocarbons (HBFCs) and methyl bromide (MeBr) to the list of substances controlled under the Montreal Protocol. The regulation of MeBr, an agricultural fumigant, was particularly controversial, and coincided with a new method of determining ODPs that suggested that MeBr reductions would play an important role in reducing ozone depletion. The Montreal Amendments in 1997 did not change any substances or schedules for phase out but created a process of trade licensing to address the growing problem of illegal trade in ozone-depleting substances. The Beijing amendments in 1999 added bromochloromethane to the list of controlled substances and modified the regulation of HCFCs to include controls on production and tighten controls on

consumption.⁴⁵ The Kigali Amendment, which was negotiated in 2016 and entered into force in 2019, requires the reduction of hydrofluorocarbons (HFCs). These chemicals have been used as substitutes for CFCs and do not harm the ozone layer but do have significant climate change effects.⁴⁶

The other important way that changes to control measures in the Protocol can happen is through “adjustments” to the obligations made by the Meeting of the Parties. Decisions to adjust the protocol can be made by approval of two-thirds of the parties, provided that this decision represents a majority of both developed and developing country parties.⁴⁷ These adjustments are binding on all parties, even those that do not vote in favor, which is quite unusual for international environmental agreements. There have been six major adjustments (separate from amendments); this adjustment process has been used to make substantive changes in treaty obligations. Among the most important of these was the acceptance of a phaseout of methyl bromide consumption by 2010 agreed to in Vienna in 1995, when previously only a freeze at 1991 levels by 1995 had been accepted by the parties. The Vienna adjustments also established dates for developing country freeze and phase out of HCFCs and phase out of CFCs, halons, carbon tetrachloride, and methyl chloroform.⁴⁸ The most recent major adjustment came in Montreal in 2007, which accelerated the phaseout of HCFCs in developing countries.⁴⁹

Because ozone-depleting substances have the same effect on the ozone layer no matter where they are emitted, those who do not participate in phasing them out could undermine the ability of others to protect the ozone layer. For that reason, there were a number of efforts under the Montreal Protocol to encourage participation, especially by developing countries. The trade restrictions with non-parties were intended to lure states without their own production capacity (which, in 1987, included most developing states) into the agreement so they could continue to buy ozone-depleting substances from the major producer states in the agreement. The ten-year time lag was meant to circumvent developing country concern about being prohibited from using ODS to develop industrially, and the promised technical and financial assistance would help them adapt to alternate technologies when their time to reduce ODS use came.

These attempts were largely unpersuasive, however. As long as some of the developing country producers of ODS – China and India, most importantly – remained outside of the Montreal Protocol system, developing states would have access to these substances. Many ozone-depleting substances also are simple enough to produce that new state production capacity could be created. Ten extra years before having to meet a standard one is not interested in meeting in the first place is not a sufficient incentive to agree to meet it. And the unspecified technical assistance looked too much like a promise that would go unfulfilled or would divert

Table 5.1 Main Changes in Montreal Protocol Obligations for Developed States

	<i>MP (1987)</i>	<i>London (1990)</i>	<i>Copenhagen (1992)</i>	<i>Montreal (1997)</i>	<i>Beijing (1999)</i>	<i>Montreal (2007)</i>	<i>Kigali (2016)</i>
CFCs	50% cut by 1998	Phaseout 2000	Phaseout 1996				
Halons	Freeze by 1992	Phaseout 2000	Phaseout 1994				
Carbon Tetra-chloride	Not controlled	Phase-out 2000	Phaseout 1996				
Methyl Chloroform	Not controlled	Phase-out 2005	Phaseout 1996				
		Voluntary phaseout by 2040	Freeze by 1999; phaseout 2030		Freeze production 2004	Phaseout by 2020	
HCFCs	Not controlled	Not controlled	Freeze by 1999	Phaseout 2005			
MeBr	Not controlled						80–85% cut by 2047, depending on state
HFCs	Not controlled	Not controlled	Not controlled	Not controlled	Not controlled	Not controlled	

Sources: Adapted from Parson, *Protecting the Ozone Layer*, 240–241 and from UNEP, *Handbook for the Montreal Protocol on Substances That Deplete the Ozone Layer*, Thirteenth Edition, 2019.

funding from other development aid. Most developing countries refused to sign the Montreal Protocol initially. Mexico was the only developing country producer of ODS that signed the protocol when it was first open for signature. Other developing states that joined early, such as Malaysia, characterized the agreement as “inequitable,” and India and China refused to join until a mechanism for financial assistance was specified.⁵⁰

In order to bring these reluctant states into the agreement, the negotiations toward the London Amendments in 1990 focused on specifying the process by which developing states would receive assistance under the agreement. The Technical and Economic Options Committees undertook a synthesis report, confirming that developing states would indeed need assistance to meet their obligations under the Protocol. Some developed countries, however, were concerned about the potential cost of such assistance and the institutional process through which it would be provided. Developed states preferred to use existing funding institutions, primarily the World Bank, but developing states were concerned that they would have little control over the allocation of funding if it were distributed through the World Bank. The United States, however, threatened to block creation of a stand-alone fund specifically for the Montreal Protocol. UNEP Executive Director Tolba organized working groups to undertake the negotiations and conducted case studies to determine what the costs of meeting control obligations would be. The pressure of US-based NGOs, developing states, and other Montreal Protocol parties, eventually reversed US opposition to the creation of a fund.⁵¹

The result was the creation of the Montreal Protocol Multilateral Fund. It was created as an interim fund in 1991 and was made permanent under the 1992 Copenhagen amendments. It funds projects in developing states (called “Article 5 countries” because it is Article 5 of the Protocol that details the special obligations of these states) to assist them in meeting their obligations under the Montreal Protocol and its amendments. The funding, contributed by developed states (“non-Article 5 countries”), is based on the UN Scale of Assessments for the donor states, which means that the wealthiest contribute the most. (Donor states may use 20% of their assessed donation to do bilateral projects if they choose.) As of June 2021, donations to the Fund reached US\$ 4.30 billion.⁵²

The funding from the Multilateral Fund is intended to cover the “incremental costs” of projects. Though sometimes difficult to calculate, the idea is that developing states should not bear the additional costs of whatever behavior they undertake in order to implement the Montreal Protocol. So if a substitute chemical costs more than an ozone-depleting substance that was being used, those costs would be covered, as would the cost to retrofit a production process with non-ODS technology. Potential cost savings are calculated as well, so if a process results in some savings those will be used to offset increased costs.

The Montreal Protocol's MOP oversees the broad aspects of the Multilateral Fund by agreeing on the replenishments of the fund every three years. The Multilateral Fund itself is run by an Executive Committee, which is charged with overseeing the activities of the fund. This process includes creating criteria for project eligibility, monitoring the implementation of projects, creating plans and budgets (on a three-year cycle) for the Fund, allocating funding to implementing agencies, and approving country programs and specific projects for funding.

The Executive Committee is composed of the representatives of 14 states, seven from Article 5 states and seven from non-Article 5 states, elected by the Montreal Protocol MOP. Decisions in the Executive Committee are made by consensus if possible, but if not, they require what has come to be known as "double-majority" voting: a decision requires a two-thirds majority that must also constitute majority votes in each bloc. This voting structure gave a measure of reassurance to developing states that their wishes could not be easily overridden. This voting structure is particularly unusual for a funding organization – in most organizations that distribute development aid (such as the World Bank and the regional development banks), donor states have voting power proportional to the amount of money they donate.

The Executive Committee has performed a serious oversight function, rather than simply approving all projects and programs put before it. At its third meeting, for instance, the Executive Committee rejected all the work programs of the implementing committees for duplication and confusion.⁵³ The Executive Committee has worked over the years to improve the effectiveness of the Multilateral Fund by modifying problematic policies. For example, developing countries were not initially required to forego funding during the period when they were allowed to increase their ODS consumption, leading to a situation in which states were able to receive funding to close old ODS-producing facilities while simultaneously building new ones. The ExCom, however, changed the process to require that states be decreasing their use of any substance for which they were receiving phase out assistance from the fund.⁵⁴

Central to the operation of the Fund are the implementing agencies that do the actual work of proposing and executing projects. These are the World Bank, the United Nations Development Program (UNDP), the United Nations Industrial Development Organization (UNIDO) (added as an implementing agency in 1993), and UNEP. The World Bank is responsible for approximately 36% of the funding disbursement; its focus is on large-scale projects. UNDP, which receives 27% of funding, focuses on technical assistance, feasibility studies, and demonstration projects, as well as some direct investment. UNIDO, with 27% of funding, focuses on investment projects and plant-level phaseout. UNEP, which is prevented by its charter from implementing investment projects, focuses on institutional

strengthening (including the establishment of National Ozone Units in recipient countries) and the preparation of country programs. It has received just under 10% of funding.⁵⁵ UNEP headquarters in Nairobi serves as Fund treasurer.

The Multilateral Fund Secretariat, run by UNEP, is located in Montreal, Canada. In addition to day-to-day administrative tasks, it is responsible for monitoring data on the performance of Fund projects, which it reports to the Executive Committee. The Fund secretariat was intentionally set up in a different location from the Protocol secretariat to increase the independence of the fund. The ExCom has given the responsibility to the Secretariat to comment on proposals before meetings and return to implementing agencies for revisions to those it does not feel are adequate. Because the Secretariat sees all the proposals, it is also well placed to put on the policy agenda those issues with broader cross-project implications.

The Multilateral Fund has had a major impact on the phaseout of ozone-depleting substances in developing countries. It has allocated more than \$3.97 billion for the implementation of projects. One hundred and forty-four Article 5 states have created National Ozone Units.⁵⁶ Many of the projects done under the Multilateral Fund have had additional benefits to recipient countries, from improvements to other environmental problems to increasing employment and economic competitiveness of domestic businesses.⁵⁷

The Montreal Protocol process has had an impressive effect on state behavior. The global phaseout of CFCs is complete as of 2016, including previously permitted exceptions for "critical use,"⁵⁸ a milestone that was unimaginable when global regulation began. Both developed and developing countries have also, with exceptions that remain for essential use, phased out their consumption and production of halons, carbon tetrachloride, methyl chloroform, and methyl bromide.⁵⁹

Some ozone-depleting substances are still in use. HCFCs have been used as substitute chemicals for CFCs because they have a much smaller ozone-depleting effect, but they nevertheless contribute to the problem and so are scheduled for eventual elimination. Production and consumption of HCFCs ended in developed countries in 2020 and is scheduled to end in developing countries by 2030 (with some additional production to service existing products remaining for each group for an additional 10 years).

There have been some difficulties along the way to complete phaseout. A reasonably serious black market in controlled substances began once developed states were required to begin phasing out their use of CFCs. Much of this black market was time limited and the incentives to use these substances decreased with shifts in technology.⁶⁰ Similarly, the emissions of CFCs and halons in some developed countries, particularly in

North America, persisted after official use ended because of slow replacement of refrigerators, air conditioners, and the use of pre-existing fire extinguishers, as well as leaks from recycling.⁶¹ A spike in CFC-11 detected in 2018 via atmospheric monitoring was ultimately traced to two provinces in Northeastern China, suggesting previously undetected illegal use of the substance;⁶² China eventually cracked down on the firms responsible. Methyl bromide, an agricultural fumigant used in growing fruits and vegetables, particularly strawberries in the United States and Australia, persisted via exemption long past its phaseout date.

Compliance with Montreal Protocol obligations has not been perfect, but the organization has a robust implementation process to address issues of noncompliance. The first states to not fulfill Montreal Protocol requirements were a set of Eastern European states that found that the economic turmoil caused by their transition from communism made it difficult to meet the 1996 deadline for phaseout of CFCs. The treaty secretariat persuaded them to submit themselves to the noncompliance procedure developed by the Montreal Protocol institution. Through this process they were allowed increased flexibility in phaseout dates and access to additional funding.⁶³ Since then, the Implementation Committee has taken up issues of noncompliance that have ranged from the procedural, primarily non-reporting of required data, to the substantive, such as consumption of controlled substances beyond that allowed by the phaseout schedule of the agreement. The states most recently found to be in substantive noncompliance with HCFC consumption measures were Azerbaijan, France, Israel, and Kazakhstan.⁶⁴

Once states have been found to be in noncompliance, they work with the Implementation Committee to formulate a plan of action to bring themselves back into compliance. Most states are generally cooperative in formulating a plan and return to compliance relatively quickly. Apart from the early black-market difficulties that have also resolved, noncompliance with the agreement has thus been fairly circumscribed. As more and more ozone-depleting substances have been fully phased out, opportunities for noncompliance disappear. Ending production of these substances means there is little available to use, and once new technologies or processes have been created that no longer rely on these chemicals, their use is no longer advantageous.

The environmental success of the agreement is also impressive. A 2009 estimate by NASA suggested that without the Montreal Protocol, the ozone layer would have virtually disappeared by 2050.⁶⁵ Because of the long atmospheric lifetimes of many ozone-depleting substances (with some of the first CFCs released in the 1920s still persisting), even decreasing the concentrations of these substances present in the atmosphere is difficult. But these concentrations are indeed decreasing, and the ozone layer is recovering. A recent study suggested that without the Montreal

Protocol, the Antarctic hole in the ozone layer would have spanned 20 square kilometers by now.⁶⁶ At the poles, where ozone depletion is greatest, Arctic ozone levels are expected to return to pre-Montreal Protocol levels by 2050, and Antarctic levels should do so between 2060 and 2075. This recovery is also good news for the health of people and ecosystems. The United Nations calculated that without the Montreal Protocol an additional 2 million people would have suffered from skin cancer.⁶⁷

This recovery, and the benefits to human and ecosystem health, would not have been possible without the creation and implementation of the Montreal Protocol. The international agreement and the institutional structure to implement it have succeeded in changing worldwide behavior in a way that is having a beneficial environmental impact. Its widespread success has also influenced global cooperation on other environmental issues.

Climate Change

The institutional process to address climate change mirrors that pertaining to ozone depletion, but it has become much more difficult to achieve effective international governance on climate change or beneficial effect on the environment. A number of institutional structures have been created, with varying levels of success.

Climate change, more colloquially known as global warming, refers to a set of changes in world weather patterns that result from increased carbon dioxide (CO₂) (and other similar gases, such as methane, ozone, CFCs, and nitrous oxide) in the atmosphere. Though there are many natural causes of these substances, their abundance in the atmosphere increased dramatically with the advent of industrialization and has been continuing to increase. Because these “greenhouse gases” increase the ability of the earth’s atmosphere to trap radiation from the sun, an increased average global temperature results. The predicted effects are varied and are not only about temperature. Increased ocean temperature leads to sea level rise because of the thermal expansion of water, and ocean and atmospheric currents are predicted to change, affecting climate patterns worldwide.

The basic science underlying the greenhouse effect has been understood for more than a century. At the turn of the 20th century, Swedish scientist Svante Arrhenius postulated that human activities responsible for putting increased amounts of carbon into the atmosphere could raise the earth’s temperature. Other scientific advances came during the International Geophysical Year (1957–1958, declared by the International Council of Scientific Unions) with the creation of permanent CO₂ monitoring stations, followed by the creation of the World Weather Watch and

the Global Atmospheric Research Programme under the World Meteorological Organization (WMO). The scientific community began discussing the need for policy action beginning with the First World Climate Conference in 1979.

Intergovernmental Panel on Climate Change

From an institutional perspective, the most important scientific organization created before international negotiations to address climate change began was the Intergovernmental Panel on Climate Change (IPCC). The WMO and UNEP created this organization in 1988, "to assess on a comprehensive, objective, open and transparent basis the best available scientific, technical, and socio-economic information on climate change from around the world."⁶⁸ Though intergovernmental, it is not a standard international organization. States appoint eminent climatologists and researchers in relevant fields to the organization, but those appointed serve as individuals rather than representatives of states. The organization was charged with reporting on the status of climate science and issuing policy guidance. Each state appoints an IPCC "focal point" that coordinates IPCC involvement of the state.

Governmental representatives to the IPCC meet annually in a plenary session. This group makes decisions on the structure and procedures and budget of the organization, as well as the mandate of working groups and the timing of new reports. The IPCC Bureau has 30 members elected by the IPCC as a whole who serve for the duration of the preparation and presentation of an Assessment Report. The Bureau is chaired by the Chair of the IPCC and includes the co-chairs of working groups and the task force. The IPCC Secretariat is supported by UNEP but hosted by the WMO at its headquarters in Geneva.

The IPCC operates via three working groups, the focus of which changes slightly with each assessment undertaken. Currently, Working Group I assesses the physical scientific aspects of the climate system and climate change. Working Group II assesses the vulnerability of socio-economic and natural systems to climate change, negative and positive consequences of climate change, and options for adapting to it. Working Group III assesses options for mitigating climate change through limiting or preventing greenhouse gas emissions and enhancing activities that remove them from the atmosphere. The IPCC also operates a Task force on National Greenhouse Gas Inventories that examines practices and methods for undertaking inventories of greenhouse gas emissions and encourages consistent practices for data assessment and reporting. Each working group and task force has two co-chairs, one from a developing country and one from a developed country. The working group and the

task force are also supported by Technical Support Units, located in (and supported by) the state of the developed country party whose nation co-chairs a given working group.

The most important output from the IPCC is the assessment reports it issues, on each of the topics the working groups focus on. Each assessment report is written by several hundred scholars and experts. The sections of the reports also undergo an intensive process of peer review, in which their findings and arguments are evaluated by qualified scholars not involved in the writing of the report. Each report also contains a Summary for Policymakers. This document is approved by the plenary session of the IPCC, which involves a negotiation of every line in the report. The lead authors of the full report also must approve the summary to make sure it is consistent with the science in the full report.

The First Assessment Report came out in 1990, before the major negotiations for an international agreement on climate change. It determined that there was a scientific reason to be concerned about climate change. After this report was issued, the UN General Assembly agreed to begin negotiations toward a climate treaty. The Second Assessment Report was issued in 1995. It is best known for the finding that “the balance of evidence suggests a discernible human influence on the global climate.”⁶⁹ The Third Assessment Report was completed in 2001 and supported the assertion that humans are impacting the climate and will continue to do so through the 21st century. It predicted continued increase in global average temperature and sea-level. The fourth report, in 2007, called human activities very likely the cause of most of the recent increases in global temperature and reported on ecological changes consistent with predictions for these increases. The fifth assessment, in 2013 and 2014, was unequivocal about the role of humans on the global climate system and predicted an ice-free Arctic Ocean during the summer by mid-century. The sixth assessment, in 2022, focused on the impacts of climate change as well as areas of vulnerability and adaptation.

In addition to these broad assessments, the IPCC has prepared other reports on issues related to climate change. IPCC Working Groups I and III worked with the Montreal Protocol’s Technology and Economic Assessment Panel on Special Report on Safeguarding the Ozone Layer and the Global Climate System, focusing on hydrofluorocarbons (HFCs) and perfluorocarbons. This report was requested by both the Conference of the Parties to the UNFCCC and the Meeting of the Parties to the Montreal Protocol, to address the fact that some common substitutes for ozone-depleting substances could contribute to climate change. This assessment contributed to the decision under the Montreal Protocol process to amend the agreement to phase out the use of HFCs, even though they do not contribute directly to ozone depletion.⁷⁰

United Nations Framework Convention on Climate Change

The scientific understanding of climate notwithstanding, the political problem of how to respond to climate change followed the new, but increasingly common, model of ozone depletion, in which a problem is hypothesized before its effects are felt. Scientists could measure the rising concentrations of carbon dioxide in the atmosphere and could predict the likely consequences, but at the time of negotiations, there had been no environmental impacts that people experienced as a result of this increase in greenhouse gases that could be unambiguously linked to climate change.

There were a number of early international efforts to address climate change politically. In the 1970s and 1980s, international scientific groups, the WMO, and others held international conferences, prior to the creation of the IPCC in 1988. Also in 1988 an international conference on "The Changing Atmosphere: Implications for Security" in Toronto called for states to cut their emissions of CO₂ 20% by 2005, and a resolution in the United Nations General Assembly called for "protection of the global climate for present and future generations."⁷¹ The following year, the UNEP Governing Council requested that UNEP and the WMO begin negotiations for a framework convention to address climate change,⁷² and the UN General Assembly recommended negotiation of a climate change agreement as well.⁷³ When the first IPCC report came out in 1990, along with the WMO's Second World Climate Conference, pressure for a global agreement intensified.

Despite the fact that initial negotiations began under UNEP and the WMO, the United Nations General Assembly took over the negotiation process with the creation of an Intergovernmental Negotiating Committee. The decision was also made to reach agreement on a convention in time to sign it at the already-planned 1992 United Nations Conference on Environment and Development.

Though the agreement was conceptualized from the beginning as a framework convention, states had different views about the extent to which the agreement would include substantive abatement commitments for developed or developing states. There were many cleavages in the negotiations on this issue: between states more and less vulnerable to climate change, between richer and poorer states, between states that are larger or smaller emitters of greenhouse gases, and between those whose income comes primarily from the production of fossil fuels and those less economically dependent on world consumption of these substances. Even within developed states there were disagreements on the best types of instruments (taxes versus emissions requirements, overall rules versus those calculated per capita) to use to minimize environmental damage.

The extent of disagreement during the negotiation meant that no actual abatement obligations were included. States committed themselves

to “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”⁷⁴ They also agreed to conduct national inventories of greenhouse gas emissions and cooperate in scientific analysis of the issue.

Negotiations on the United Nations Framework Convention on Climate Change (UNFCCC) were completed in time for the agreement to be signed at UNCED in 1992. The agreement entered into force in March 1994. Developing countries are promised funding to meet the “full costs incurred ... in complying with their obligations,” indicating as well that the extent to which developing countries would be responsible for any action under the convention would depend on the developed countries meeting their obligations to provide funding and technology.⁷⁵ The Global Environment Facility (discussed further in Chapter 7) is designated as the institution to coordinate this funding process.

Kyoto Protocol

Negotiations for a protocol were initiated by the first Conference of the Parties in Berlin in 1995. The Ad Hoc Committee on the Berlin Mandate, as the negotiating committee was called, held eight negotiating sessions between 1994 and 1997. The Kyoto Protocol as eventually negotiated required actual reductions in emissions of greenhouse gases by developed countries (those listed in Annex I of the UNFCCC) by the time period 2008–2012, in what came to be known as the first commitment period. These reductions were based on a 1990 emissions baseline and would have averaged about 5.2% had the United States participated in the agreement; without the United States the target was closer to 4.2% in aggregate.⁷⁶ These obligations differ by state, based largely on what individual states were willing to agree to rather than any specific environmental or economic logic. Following the precedent set in the Montreal Protocol for special consideration for developing countries (listed in Annex II of the UNFCCC), there was no real consideration of obligations for these states in the negotiation of the agreement. They have no emissions abatement obligations under the Kyoto Protocol and are granted funding and technology transfer to support their activities (such as national reporting) under the UNFCCC.⁷⁷ There was opposition to this exemption of developing states from abatement obligations, particularly on the part of the United States. In the long run, developing states (some of whom are currently among the largest emitters of greenhouse gases) will need to reduce their greenhouse gas emissions for any significant impact to be made, but the precedent from the Montreal Protocol to give special consideration to developing countries (especially when their emissions had not been the initial cause of the problem) was strong.

The Protocol included three “flexibility” mechanisms that give states options for meeting their reduction obligations. The first is emissions trading. States that reduced their emissions more than required were allowed to sell the spare reductions to other states for them to use to meet their obligations. The second is known as joint implementation. Developed country parties could receive credit for projects done in other developed country parties to reduce greenhouse gas emissions. Finally, the agreement created the Clean Development Mechanism (CDM), which allows developed country parties to receive emissions reductions credit for projects done in developing countries.

The same institutional structure oversees both the UNFCCC and the Kyoto Protocol. The secretariat is located in Bonn, Germany. The main decision-making body for the Protocol is the Meeting of the Parties, which meets annually, in conjunction with the COP for the UNFCCC. The institutional structure also includes a Subsidiary Body for Scientific and Technological Advice and a Subsidiary Body for Implementation, which meet twice a year and advise the COP. The Marrakesh accords also added a CDM Executive Board to oversee implementation of the CDM, with representation from states with different concerns about climate change.⁷⁸

The Protocol featured a double ratification rule, requiring that 55 states, representing 55% of developed country emissions of greenhouse gases in 1990, ratify the agreement before it could enter into force. Because the United States had declared its intention not to ratify the agreement, meeting that emissions threshold required the ratification by almost all other developed country parties. That gave great bargaining leverage to those who had not yet ratified, and a number of conferences subsequent to the negotiation of the agreement modified the requirements in ways that appeased the concerns of those that had not yet ratified, particularly Japan, Canada, Russia, and Australia. Russia was the final of this group to ratify, in November 2004, causing the protocol to enter into force in February 2005.⁷⁹

The United States did not, as promised, ratify the agreement. Canada withdrew from the Protocol as of 2012. The proximate cause of the withdrawal was the likelihood that Canada would not be able to meet its emissions targets and would suffer large financial penalties under the agreement for this failure. More generally, Canadian official support for climate change mitigation had withered under a Conservative government, and the ineffectiveness of a global climate treaty that did not include the United States and in which China did not have emissions reductions obligations probably also played a role.⁸⁰

Results from the first commitment period were mixed but largely positive. Member states with commitments did, on average, reduce their

greenhouse gas emissions, collectively going further than required. Total emissions (not including land use changes) among this group decreased by approximately 24%, though some states with increased emissions met their obligations only through emissions trading. The European Union states reduced on average by 12.2% (when their collective obligation was 8%). Much of the reduction across states with obligations, however, was in the form of what was called “hot air.” These were emissions reductions that came, even before the protocol was negotiated, from the economic crisis as the former Soviet states transitioned from communism. These emissions reductions were real, but not attributable to the Kyoto Protocol.⁸¹

Importantly, the world’s largest emitters of greenhouse gases, the United States and China, did not have emissions reduction obligations under the agreement; the United States because of failure to ratify the agreement and China (along with other developing countries) because the agreement only required emissions reductions from developed countries. It is nevertheless likely that the commitments made under the agreement did play a role in changing emissions behavior, especially by members of the European Union.

After earlier failed efforts (most notably in Copenhagen in 2009 at the 15th Conference of the Parties to expand Kyoto’s regulations), obligations for a second commitment period were agreed to in 2012 (for a period ending 2020) as part of the Doha Amendment to the Protocol. Most of the parties (most prominently the European Union) that accepted commitments for the first period also accepted them for the second, though Japan, New Zealand, and Russia did not.⁸² The amendment nevertheless entered into force on December 31, 2020.⁸³

Paris Agreement

The closest thing to a successor agreement to the Kyoto Protocol is the Paris Agreement on Climate Change. It was completed at the 21st UNFCCC Conference of the Parties meeting in Paris in December 2015. It operates on the basic idea that states create individual climate targets—“Nationally Determined Contributions”—that are then collectively recorded by the agreement, in the context of a broader collective goal to keep the global average temperature from increasing by more than 1.5 degrees Celsius. All states (developed and developing alike) are required to make these goals and update them every five years. There is no legal mechanism to impel implementation (or content of) of these targets, but increased transparency of commitments and actions may allow for adverse publicity to shame states that fail to live up to their own commitments and to encourage them to adopt ambitious ones.

There were some meaningful initial NDCs. The European Union, during the negotiation of the agreement, promised a collective 40% reduction

from 1990 emissions levels by 2023.⁸⁴ China's announced commitment involves a goal for greenhouse gas emissions to peak in 2030 and for its share of non-fossil fuels in primary energy consumption by that year to be 20%.⁸⁵ The United States, in the context of the negotiation, also pledged to reduce emissions by 25–28% relative to 2005, by 2025.⁸⁶

Most states have now updated their NDCs (or submitted new ones), as they are required to do every five years, with increased ambition. The United States, for instance, has pledged to reduce emissions by 50–52% relative to 2005 levels by 2030.⁸⁷ Australia, which initially pledged greenhouse gas reductions of 26–28% (relative to 2005) by 2030 has updated its target to reduce emissions by 43% in the same timeframe.⁸⁸

The agreement creates a framework for increased financial donations in the broader context of existing climate funding obligations under the UNFCCC (with a goal of \$100 billion in funding, as part of the Green Climate Fund and Adaptation Fund agreed to at the 2009 Copenhagen meeting). This funding enables capacity building to assist developing countries in meeting their objectives. The agreement also has a focus adaptation to impending climate change as a central goal and also a target for funding.⁸⁹ The agreement is subsidiary to the UNFCCC,⁹⁰ and so makes use of the secretariat and other functions already in place.

It is a legally binding agreement (requiring ratification a minimum of 55 states that collectively represent at least 55% of 2015 greenhouse gas emissions); it entered into force in November 2016. After the problems caused for the Kyoto Protocol by the lack of US ratification of that agreement (which it had also signed), the Obama administration in the United States adopted the Paris Agreement by executive agreement, making the case that it did not require Congressional ratification because the emissions obligations are simply pledges and thus not legally binding. Finding a way to craft a global agreement that could get around the intransigence of the US Congress played a role in the consideration of options for the form of the agreement. When Donald Trump took office in 2017, one of his first acts was to give formal notification of US withdrawal, though this withdrawal did not take effect until just after the 2020 election that brought Joseph Biden to the US presidency; Biden promptly brought the United States back into the agreement. Having both the United States and China in a global climate agreement was a necessary condition for it to have any real chance at affecting global greenhouse gas emissions.

The results, thus far, of the Paris agreement are mixed. From the beginning of its negotiation a number of climate scientists criticized it as too weak to accomplish its goals,⁹¹ and there is concern that false hope of a global solution could decrease pressure for more significant action. Collectively, the first set of NDCs, even if fulfilled, are estimated to come nowhere near what would be needed to actually meet the Paris Agreement's goal of

keeping warming to 1.5 (or even 2) degrees Celsius.⁹² Many organizations have attempted to compare NDCs and calculate their sufficiency; one of these, Climate Action Tracker, finds most country pledges to be insufficient.⁹³ There is some optimism for the second set of NDCs. Many of these updated commitments focus on nearer-term emissions reductions and plans for net-zero emissions. A study in the journal *Science* models the effects of updated NDCs and suggests that they create a greater possibility of keeping warming within the parameters the Paris Agreement aims for.⁹⁴ The processes of the Paris Agreement call for a “global stocktake” every five years, to assess collective progress toward meeting the goal of the agreement; the first of these was set to conclude at the end of 2023.

Other scholars suggest that creating a process in which, for the first time, all states take on obligations to reduce their contributions to climate change is a sufficiently meaningful development⁹⁵ and that the public nature of pledges and accountability measures will persuade states to commit to and fulfill meaningful action.⁹⁶ Time will tell.

Conclusions

Some of the institutions addressing problems of the atmospheric commons, most notably those addressing acid rain in Europe and ozone depletion globally, have been among the most successful global environmental institutions. The institutions governing all three of the issues examined here followed similar processes, beginning with general framework conventions that set out the goals and processes of cooperation, followed, as new information clarified the environmental problem, by increasingly strict protocols mandating substantive emissions reductions.

CLRTAP has progressively tightened restrictions on emissions of acidifying substances in Europe and expanded the substances it regulates, and environmental conditions on the ground have improved. The Montreal Protocol governance process has changed industrial activity with respect to chemicals previously considered safe and has resulted in complete phaseout of many of these chemicals previously considered to be indispensable, as well as important signs of the long-term recovery of the ozone layer. The problem of climate change is more controversial and difficult to address. The Kyoto Protocol, which followed for climate change a similar approach to those taken by efforts to address acid rain and ozone depletion, had a more mixed experience, both at gaining adherents to its obligations and in broadening and deepening its obligations over time. Instead, new approaches to persuade reluctant states to design, and commit to, their own climate targets, as the Paris Agreement does, may serve as a model for new institutional formats for addressing issues of the global commons. The global climate system may depend on how successful these turn out to be.

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6 Transboundary Movement of Hazards

International action is needed, and institutions have been created, to address environmental problems that cross national borders. Often this border crossing is unintentional. Acidifying substances in the air travel with the prevailing winds; CFCs reach and deplete the ozone layer in places unrelated to where they are released. While the environmental harm caused by these substances is unintentional, they are used and released in the course of intentional industrial activity. Alternately, sometimes the resource of concern is itself transboundary. Migratory species move across national jurisdictions in ways that suggest that they, or the habitats on which they depend, must be protected in multiple places. Harm to these species requires protecting them in all locations to which they travel.

Another set of institutions addresses the movement of – and often trade in – hazardous substances. In some cases (as with trade in hazardous waste) these substances are themselves the byproducts of other industrial activity, but the trade is not incidental: this waste is transported intentionally to locations where disposing of it is cheaper or easier than in the location in which it was generated. In other instances (such as with pesticides or persistent organic pollutants, and even plastics) the substances in question are themselves useful but have been discovered to be harmful to human and ecological health to an extent not initially anticipated. Their movement across borders, either intentionally as substances banned in one location and traded to others where they are not, or through ecological cycles and movement within the food chain, transmits them to locations where people and organisms that did not choose exposure to them may be harmed. And in the case of mercury, one of the most recent hazards to be addressed by global institutions, several of these pathways are at work: it is contained in products but also emitted as an externality of other processes – such as gold mining or coal burning – in which its presence is inherent but unintended. More than a million people die each year from occupational exposure to hazardous chemicals,¹ and many more are exposed incidentally.

The first of the global agreements created to address these problems were those that focused on international trade in hazardous waste. The next focus was on trade in hazardous chemicals and pesticides. From there the logical expansion was to regulate the movement of other types of chemical hazards – persistent organic pollutants and eventually mercury and most recently plastics – that move at least partly unintentionally.

These efforts share a number of similar approaches. The first is the idea of Prior Informed Consent (PIC), the principle that states should have the right to know what they (or their residents) might be allowing across their borders and what dangers it could cause. Based on this knowledge they should be able to refuse import. (This principle, renamed “advanced informed agreement,” is the same approach that was later applied to the Biosafety Protocol, considered further in Chapter 3). An extension of this approach allows states to categorically refuse specified imports of hazards; to indicate that they should never be contacted even to request permission to move something across their borders. The concerns about more diffuse harms from toxic substances has been approached by restricting trade even to states that have not banned the use of these substances, unless it is for environmentally sound disposal, and efforts to end the use of hazardous substances in products and processes where possible.

The second major similarity is that these agreements achieve their main regulatory objectives at least in part through restricting trade. This restriction, moreover, applies in some cases to states that have not taken on the obligations of the treaties in question, requiring that states refuse to trade in these substances with states that are not members of the agreement. There have been concerns expressed that these processes may run afoul of the World Trade Organization prohibition on restricting trade for purposes other than trade policy. This concern is greater in cases where trade prohibitions affect trade with non-parties, since they have not consented to the trade-restrictive regulatory structure. The agreements, particularly the more recent ones, have been negotiated with the knowledge of the potential intersection between the two sets of principles but have chosen not to address the issue head on. The Stockholm Convention on Persistent Organic Pollutants, for instance, simply notes that “this Convention and other international agreements in the field of trade and the environment are mutually supportive.”² Such a statement neither indicates an intention to supersede WTO rules when conflict arises, nor subsumes Stockholm provisions to WTO standards.

These agreements and the institutions they create are focused at least partly on giving developing states practical control over their borders that they already have in principle as sovereign states. One might wonder why states need to have the right in a treaty to refuse to accept hazardous substances. But in practice developing states have often had little knowledge of what passed across their borders. The negotiation of agreements

to address transfer of hazardous substances began after a number of high-profile examples of this lack of developing country control.

Transboundary Movement of Hazardous Wastes

Though there is no universally accepted definition of hazardous waste, it is generally understood as unwanted material that poses a threat to human health and the environment. The question of what constitutes waste is as difficult as that of what should be considered hazardous; what is unwanted by some is useful to another, further complicating efforts to define or measure hazardous waste. The vast majority of what is generally considered to be hazardous waste (more than 400 million tons per year)³ is currently generated by states in the developed world, about 74% of the total.⁴ In many of the states in which this waste is produced, increasingly strict regulations about how it can be disposed have increased costs of local disposal dramatically. States have thus looked for disposal opportunities elsewhere.

The popular press often refers to these international disposal processes as “dumping.” But although there certainly have been efforts to deposit hazardous waste in locations without the knowledge of the officials of the state in which it has been left, for the most part this transfer happens as a commercial transaction with financial compensation. States (or commercial entities) with waste pay other states (or commercial entities) to dispose of it. In theory this situation might not be a bad one: disposal states may choose whether the income they gain from agreeing to dispose of such waste offsets the potential environmental dangers it causes. In the best of circumstances waste could be disposed of in a location that is safer for it – away from population centers and water sources, in geologically stable areas – than the location in which it was generated.

In practice, however, these efforts have functioned in a less-than-ideal manner. States that agree to take in waste may do so without the resources or knowledge to dispose of it safely; acquiescing either because they do not know the extent of the hazards or because their economic situation is sufficiently dire that they will take the risk for the promised income. Often these transactions do not take place between states. A commercial enterprise in one state that needs to dispose of its waste in a cost-effective manner may contact individuals in another state who agree to take it in without the knowledge of either side’s state. Among the most frequently mentioned examples of this kind of transaction is the Nigerian citizen who rented his backyard to an Italian company for the storage of 8000 barrels of toxic and carcinogenic wastes.⁵ Though most of the hazardous waste trade takes place between industrialized countries,⁶ an increasing amount now happens between developing countries, the aspect of this trade that provided the impetus for international negotiations was that between rich and poor states. This trade was increasing by the mid-1980s.⁷

There is concern not only about the disposal location but also about the process of moving the waste. The long-distance transport of hazardous substances increases the possibility that accidents along the way will create environmental damage and increases the geographic range in which such a disaster could happen. Being able to transport waste to elsewhere to dispose of it can also be responsible for decreasing the pressure on those who generate it to change their practices. Requiring states to dispose of waste within their own borders (or industrial actors to bear the cost of local disposal) helps to internalize some of the externalities of waste disposal and increases the incentives to find better ways to store it or avoid its generation in the first place.

The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal

Concerns about these types of problems, and the dangers to the environment and to human health that could result, prompted international attention to the issue of hazardous waste trade and the eventual negotiation of an international agreement to address it. The first efforts to manage hazardous waste trade internationally came from the Organization for Economic Cooperation and Development (OECD). In the 1980s the OECD developed a set of principles to control the movement of hazardous waste among countries in the OECD and created a system to classify and control such wastes. In 1985, the organization also proposed a draft for an international agreement to regulate movement of hazardous waste across state borders. The OECD yielded its involvement to UNEP once it became clear that UNEP was seriously pursuing an international agreement.⁸

UNEP first took up the issue in 1981, and the Governing Council created a working group to focus on the disposal of hazardous waste in 1982.⁹ In 1985 this working group produced the Cairo Guidelines and Principles for Environmentally Sound Management of Hazardous Wastes, which the UNEP Governing Council adopted in 1987. These guidelines specified that exporting states should notify recipient states of the content of shipments of hazardous materials and should receive the consent of the recipient state before export. The exporting state should also verify that the recipient state has disposal requirements as stringent as those in the exporting state. These guidelines did not legally bind states, however.

The adoption of the Cairo Guidelines included a process (already planned at the time of the Governing Council decision) for the negotiation of an international, legally binding, agreement on the control of these substances.¹⁰ The initial negotiating meetings took place in Budapest, with the adoption of the binding agreement in Basel, Switzerland, in 1989. UNEP Executive Director Mostafa Tolba played a central role in the negotiations, insisting that it be a substantive agreement rather than a framework convention.¹¹

Negotiations were contentious. Developing states, particularly those in Africa, along with NGOs led by Greenpeace, wanted to create a system in which developed states could not export hazardous wastes at all, or at least not to developing states. But the primary waste generating states in the industrialized world, especially the United States, refused to agree to a system in which this waste trade was prohibited. Developing states eventually acquiesced to a PIC system, believing it to be better than creating no agreement at all. The specification of the notification and consent scheme was contentious as well. Developing and industrialized states disagreed over how stringent the consent requirements would be, the extent of economic assistance for developing states, and the extent of liability requirements.¹² One rejected provision, for instance, would have required that the standards for handling of hazardous wastes in countries of import be at least equally stringent to those in the country that was exporting waste. African states initially proposed that United Nations inspectors verify the compliance of disposal sites with treaty requirements, but this provision was also voted down.¹³ Other controversies concerned the right of transit through states and how to consider dependent territories and territorial waters.

The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal was open for signature in 1989 and entered into force in 1992. The convention is organized around a set of principles. First, the generation of hazardous waste should be minimized. Second, hazardous waste should be disposed of in a location as close to where it is generated as possible. Finally, transboundary movement of such waste should be tightly regulated. Annex I of the convention specifies categories of wastes controlled under the agreement, Annex II lists wastes not controlled (such as household waste) but that nevertheless require "special consideration," and Annex III defines "hazardous characteristics."

The specific rules embodied in the agreement make use of the idea of prior informed consent (PIC). Each state must appoint at least one "competent authority" and designate one as the recipient of information about the transfer of hazardous waste. Any state wishing to export hazardous wastes must notify (in writing) the competent authority of a recipient state. The recipient state is supposed to respond in writing within 60 days either consenting to the shipment or denying permission. States may, however, waive their need to respond; under these circumstances if no reply is received during the 60-day period, exporting states may carry through with the export.¹⁴ This latter provision can be seen as a weakening of the PIC principle. Developing states lacking capacity may have difficulty responding within 60 days, and not requiring an affirmative answer before shipping hazardous waste could lead to undesired receipt by developing states. While exporters are charged with ensuring that any waste they

export only goes to states that are able to dispose of it in an environmentally sound manner, there is no actual definition of what constitutes “environmentally sound,” nor any clear process for ensuring that disposal meets that requirement once it has been sent.

States are allowed to prohibit the import of hazardous waste entirely. They must inform the secretariat and then other states may not allow export of hazardous wastes to these states. By 1994, a mere two years after the agreement had entered into force, nearly 100 states had chosen to refuse all imports of hazardous waste.¹⁵ In addition, any waste that is exported illegally, or waste that is exported within the requirements but that cannot be safely disposed of by the state that imports it, must be taken back by the state from which it originated.

Other obligations, such as the requirement to ensure that “the generation of hazardous wastes ... is reduced to a minimum,” are technically legally binding, but almost impossible to enforce or even measure. Transport of waste is also forbidden to the Antarctic. In addition, states may not trade in hazardous waste with states that are not members of the agreement, unless the waste shipment takes place under an international agreement that provides protections that are as strict as those required by the Basel Convention and are compatible with it.¹⁶

Amendments to the agreement are to be proposed and voted on at meetings of the Conference of the Parties (COP). In order to be adopted an amendment must receive a three-fourths majority vote (of all parties present and voting). After an amendment has been adopted it must be ratified by individual states that voted in favor of the amendment originally, in order to bind them. When three-fourths of these states that voted in favor of the amendment have ratified it, the amendment enters into force.

The COP is the institution’s decision-making body. It ordinarily meets every two years; recently those meetings have happened in conjunction with COPs for other toxics-related conventions, as discussed in Chapter 7. An Open-Ended Working Group (OEWG), and sometimes other technical working groups, meets in between COP meetings and works to implement and review COP decisions and convention effectiveness. There is also an Implementation and Compliance committee, and other working groups are formed as needed. Secretariat services for the agreement are provided by UNEP, headquartered in Geneva. Initially the secretariats for the three main toxics agreements, Basel, Stockholm, and Rotterdam, operated independently with separate Executive Secretaries, but beginning in September 2015 they unified under one Executive Secretary, as discussed further in Chapter 7. Within this structure, the secretariat operations have separate organizational structures that focus across all three conventions on Conventions Operations, Technical Assistance, and Scientific Support.¹⁷

A 1999 Protocol on Liability and Compensation (adopted at COP-5) creates a framework for providing compensation for illegal dumping or spills of toxic wastes transported internationally and to assign liability for these problems. This issue was omitted from the original agreement and instead included as a protocol. As of mid-2023 it had received only 12 of the 20 ratifications required to enter into force.¹⁸

The 6th Conference of the Parties in 2002 adopted a compliance mechanism. This process created a Compliance Committee consisting of 15 member states drawn from five different UN regional groups. Parties may submit information about noncompliance – their own, or that of another party – to this Committee. The Secretariat may also submit information to this committee when there is evidence in national reports that states may be having difficulty meeting their obligations under the agreement. The committee primarily focuses on assisting parties through technical assistance rather than on punishing infractions. Its terms of reference explicitly state that it is to be nonconfrontational and that its objective is to “assist Parties to comply with their obligations under the Convention and to facilitate, promote, monitor and aim to secure the implementation of and compliance with” the agreement.¹⁹ This process was first invoked in 2011 with a self-submission from Oman, and nine submissions from the Secretariat, all of which pertained to difficulties with the reporting requirements. This pattern has continued in subsequent meetings, with a mix of self-submissions and Secretariat-identified problems in meeting reporting requirements. Thus far this committee has worked with these states to provide advice and some limited financial resources in an effort to increase their ability to implement the reporting provisions of the agreement. Not all of the states brought before this process participated actively in efforts to remedy the problems,²⁰ and their cases have continued to be discussed in subsequent meetings.

Among the most important decision-making work of the Conference of the Parties has been the adoption of what is known as the Basel Ban. This process originated at the first meeting of the Conference of the Parties in 1992, in a proposal from UNEP Executive Director Tolba that the parties ban trade in hazardous waste between developed and developing countries. At this point his proposal was widely supported by developing states, and some European states – Finland, Denmark, Norway, Switzerland, Italy, and Sweden – supported it as well. But the opposition of the other major industrialized states was enough to block adoption of the proposal at that point. The issue was brought up again in the Conference of the Parties in 1994, where it received majority support to prevent the shipment from states that are members of the Organization for Economic Cooperation and Development (OECD), a group of developed states, to those that are not. This agreement would have taken effect in 1997. But some states argued that such a measure could not be passed by COP decision, since it

would have the effect of amending the convention. Instead, in at the third COP in 1995, a majority of parties voted in favor of amending the convention to accomplish the same end.²¹ Amendments require ratification by three-quarters of the states “who accepted them” to enter into force.²² What that meant in the case of the Basel Ban was subject to political wrangling. Initially it was assumed to be three-quarters of those who originally accepted it, a threshold that would already have met before too long. But the UN Office of Legal Affairs argued that three-quarters of current members need to ratify the amendment for it to enter into force.²³ The amendment finally entered into force in 2019.²⁴

The other important recent amendments relate to plastic waste, adopted by the 14th COP, in 2019. Three different annexes were amended to add plastic as a regulated material, requiring PIC (and the same efforts at minimization and environmentally sound management that other hazardous wastes are subject to). One type of plastic waste – primarily that consisting of one of a set of fluorinated polymers or only one non-halogenated polymer – is exempted, as are mixes of particularly recyclable plastics destined for recycling. These amendments were structured such that they became binding after six months on all states that had not issued a notification of non-acceptance. Most Basel member states, therefore, have been bound by them since 2020.²⁵

An additional controversy under the agreement has been the status of waste transport for recycling, especially electronics waste. During the negotiation of the convention it was initially uncertain whether waste destined for recycling would be subject to regulation, but it was eventually included. Once the Basel Convention and other regulations in developed countries to restrict trade in hazardous waste came into being, the international shipment of waste for “recycling” increased noticeably.²⁶ One of the main points of contention in the negotiation of the Basel Ban was over whether to include waste intended for recycling in the ban. Some of the major industrialized states (including the United States, the United Kingdom, and Japan) argued that waste for recycling should be exempted from a ban on trade. Developing states, however, wanted the ban to cover all waste trade and pointed to a study by Greenpeace indicating that much waste had been falsely labeled as recyclable or simply not recycled after being transported to developing states.²⁷ The eventual compromise allowed the trading of waste between north and south for “resource recovery, recycling reclamation, direct re-use, or alternative uses”²⁸ until 1997, but not thereafter.

Finally, while much of the international trade in hazardous waste is now indeed conducted under the regulated system of prior informed consent that the Basel Convention oversees, it is much less clear that the institutional processes under the agreement have had a major impact in reducing the extent of international trade of such substances. In general,

international trade in waste increased dramatically in the decades that followed the Convention's entry into force in 1992.²⁹ Collective reports of hazardous waste imports are, in each year, higher – sometimes dramatically so – than the collective reports of hazardous waste exports,³⁰ suggesting that reports of trade are inaccurate and exports likely understated.

More importantly, the institution has little impact on the other main objective of the agreement: reducing the generation of hazardous waste overall. Perhaps not surprisingly, the generation of hazardous waste has increased since the agreement was negotiated. UNEP points out that it is difficult even to track the generation of hazardous waste over time because data availability is poor and states use different definitions for waste statistics they do report, but for almost every country that reports statistics, generation has increased from the 1990s to the present.³¹ The United Nations estimates that 50 million tonnes of electronic waste is generated annually and that the total amount is growing at three times the rate of growth in general waste.³²

A 2004 secretariat report suggested that immediately following the entry into force of the agreement the global generation of hazardous waste decreased by a small amount, but the report attributed this diminution to the changes in activities of former Soviet-bloc countries transitioning to market economies, rather than to any effect from the Basel Convention. Moreover, hazardous waste generation has been increasing consistently since a low in 1996.³³ The 5th COP, in 1999, decided that a focus for the first decade of the new century would be on waste minimization, itself an acknowledgement that the first decade of the agreement had had little impact on this aspect of the problem of hazardous waste. More importantly, the agreement is not set up to achieve a reduction in hazardous waste generation. It contains only vaguely worded obligations to reduce generation, does not have a uniform definition of hazardous waste, and does not require states to even calculate their level of generation of regulated wastes, thus providing no point of comparison for behavior over time.

The Basel Convention did not end problematic disposal of hazardous waste in developing countries. In 2006, more than 100,000 people sought medical attention (and at least 17 died) in the Ivory Coast after a Panamanian-registered ship (chartered by a Dutch-registered shipping company with British ownership) offloaded toxic materials in Abidjan. The ship owners claimed it was simply slops from the ship, but it was almost certainly a mix of toxic materials the company had declined to pay a large fee to dispose of in the Netherlands.³⁴ The UNEP Executive Director established a trust fund to help the country respond to the disaster.³⁵

As of mid-2023 there were 191 parties to the agreement.³⁶ The United States has signed but not ratified the agreement. It participated in the negotiation as the center of the coalition of developed states that refused to participate if a ban on waste trade from North to South was

enacted. The United States has also actively opposed the Basel Ban and worked hard, through indirect methods (since it is not a party to the treaty and thus cannot participate in its decision-making processes directly), to gather opposition to it. The possibility that the United States might ratify the Basel Convention without the ban amendment has caused enough of a major controversy that some environmental activists would prefer that the United States remain outside of the agreement altogether.³⁷ If the United States joined the agreement without the ban it would then be allowed to trade hazardous waste with other member states and not be bound by the prohibition against sending waste to developing states. Though the United States disposes of the vast majority of the hazardous waste it generates within its own borders, its share of the world's generation of hazardous waste is so large that even the small amount of waste it does send abroad makes it one of the important exporters of such waste.³⁸

Other existing international organizations have crafted regulations pertaining to transboundary movement of hazardous waste that complement the Basel Convention processes. The OECD has focused on addressing waste intended for recycling. Wastes are designated as either "green" or "amber" to separate wastes that are not hazardous from those that have some hazardous characteristics (and, under the scheme, require at least tacit consent for shipping, after notification).³⁹ The lists of what fits under which designation has been frequently amended.

The European Union (EU) has also addressed hazardous waste for its member states. Beginning in 1984, the EU required that states notify member states before shipping wastes considered to be hazardous.⁴⁰ This regulation was expanded in 1986, requiring that EU member states receive consent to ship hazardous waste to any state, whether it was an EU member or not. Both regulations were superseded by a 1993 regulation that incorporated Basel Convention rules into EU regulations and adopted the OECD classifications for waste recycling.⁴¹ In addition, under the Lomé IV agreement, the EU ceased exports of hazardous wastes to the developing countries with which it had historical colonial relationships.

Bamako Convention on the Ban on the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa

African states had agitated for a much stronger regulatory system under Basel that would ban waste trade between developed and developing countries. When the initial negotiation failed to include such a provision, the Organization of African Unity (OAU) immediately began negotiations on an African agreement that would go further. OAU Resolution 1199, calling for this new agreement, argued that the inadequacies of the

Basel Convention with respect to monitoring, technical and financial support, and especially its continued acceptance of hazardous waste trade, required a “common African position” on the issue of hazardous waste and its transport.⁴² As a result, OAU members remained initially apart from the Basel Convention.⁴³ Only after the negotiation of a separate African agreement did some choose to join Basel as well.

The OAU created a working group of experts in law and environmental issues to draft a negotiating text. Negotiations were completed on the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa in 1991, and the agreement entered into force in 1998. As of 2023, there are 25 parties.⁴⁴ Nigeria, importantly, is not a member, despite its history of suffering from questionably legal imports of hazardous waste.

The Bamako Convention uses a broader definition of hazardous waste than does Basel, holding household waste to the same standards as other hazardous wastes. Unlike Basel, it applies as well to radioactive waste. It also defines as hazardous any substance that has been banned, canceled, or not accepted for (or withdrawn from) registration in the state in which it was manufactured. Annex I of the agreement lists the categories of wastes that are controlled under the agreement, and Annex II specifies the characteristics of wastes considered to be hazardous.

The primary obligation of the agreement is for states to forbid the import of hazardous wastes, into any jurisdiction they control, from non-contracting states. Since only OAU (now African Union) member states can join the agreement, this provision prohibits imports of hazardous wastes from any state outside of Africa. States that are party to Bamako also agree not to dump or incinerate hazardous wastes in internal waters or on the high seas.⁴⁵

The actual institutional function of the Bamako Convention took a while to get going. The decision-making body for the agreement is the COP, in which all member states are represented. The African Union (the successor organization to the OAU) assumed secretariat responsibilities and is responsible for calling meetings of the COP. While the treaty stipulated that the first meeting should happen within a year of entry into force, the first COP didn’t take place until 2013. Two more have happened since then. In addition, UNEP held a regional meeting in Africa among member states of the Bamako Convention and relevant Basel Convention representatives in 2015, signaling closer collaboration between these processes.⁴⁶

The convention has served an important role for African states to indicate, pursuant to the Basel Convention, that they will not accept shipments of hazardous wastes. But ensuring that these wishes are fully respected will require a governance process that Bamako and the African Union have been slow to fully implement.

Other Regional Agreements

Additional regional organizations have taken the opportunity that exists under the Basel Convention to negotiate regional agreements that expand upon the obligations of states to restrict hazardous waste trade. States of Central America created the *Acuerdo Regional sobre Movimiento Transfronterizo de Desechos Peligrosos* in 1992, which requires that Central American states ban the import to and transit through their territory of hazardous waste. Members of the South Pacific Forum negotiated the *Waigani Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Managements of Hazardous Wastes* within the South Pacific Region in 1995. It requires that states ban the import of hazardous (including radioactive) waste. The hallmark of the regional agreements negotiated along these lines is that they create a complete ban on hazardous waste imports from outside the region. The regional seas and related agreements (see Chapter 2) have negotiated post-Basel Protocols addressing wastes but following a strategy of minimizing waste generation and creating rules for better managing the trade in hazardous substances that exists. The states party to the *Barcelona Convention for the Protection of the Mediterranean Sea against Pollution*, for example, added the *Izmir Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and Their Disposal* in 1996.

Other Traveling Toxics

Wastes are not the only hazards traded across borders. As rules to address trade in hazardous waste were being developed, international attention turned to addressing additional types of hazardous materials that might move across borders but would not necessarily be regulated by rules pertaining to waste. Chemicals and pesticides were increasingly exported internationally, and the 1970s and 1980s saw an enormous expansion of these exports to developing states, which by 1980 received a quarter of all trade in chemicals and one-third of all trade in pesticides.⁴⁷ This trade was not without consequences: the World Health Organization estimated that between 1.5 and 3 million people were accidentally poisoned by these substances annually, the vast majority of these poisonings taking place in developing countries.⁴⁸ Initially some harmonization of national rules pertaining to the regulation of chemicals was undertaken by the OECD, but these rules did not attempt to regulate the transboundary movement of chemicals when states did not already have strong existing legislation.

The issue of international chemical safety had been taken up by a variety of UN bodies, most prominently UNEP and the United Nations Food and Agriculture Organization (FAO). Both initially focused on increasing the availability of information about the hazards of chemicals traded

internationally. In 1985, the FAO, focusing on chemicals used as pesticides, adopted an International Code of Conduct for the Distribution and Use of Pesticides. UNEP had begun to address the issue of trade in hazardous chemicals as in the 1970s, in a decision recommending that governments work to prohibit export of chemicals that have been banned domestically, at least without the consent of the importing countries.⁴⁹

One of the central processes for the regulation of chemicals existing at this time was the International Registry for Potentially Toxic Chemicals (IRPTC) created in 1976, following a recommendation from the Stockholm Conference in 1972. This registry, headquartered in Geneva, compiles information on regulations already in place in states that export chemicals, including limits and bans. A 1982 General Assembly resolution, at the behest of developing states, created the UN Consolidated List of Products Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or not Approved by Governments,⁵⁰ a similar mechanism, to which IRPTC contributes. In 1984, prompted by the Dutch government, the UNEP Governing Council created a Provisional Notification Scheme for Banned and Severely Restricted Chemicals, an expansion of IRPTC's mandate (again, with IRPTC contributing, by developing a database of decisions by states to restrict specific chemicals). Under this system states were to choose Designated National Authorities (DNAs) to notify IRPTC of any national actions controlling chemicals.

In 1987, the UNEP Governing Council adopted the London Guidelines for the Exchange of Information on Chemicals in International Trade⁵¹ in an effort to create a permanent system. The guidelines call upon states that export or import chemicals to exchange information and establish regulatory mechanisms to better manage chemicals, including by creating national registers of toxic chemicals.

Additional intergovernmental processes for the management of chemicals came out of preparations for the 1992 Rio conference. Chapter 19 of Agenda 21, which addresses the "Environmentally Sound Management of Toxic Chemicals Including Prevention of Illegal International Traffic in Toxic and Dangerous Products," specifically calls for the creation of an intergovernmental forum on chemical safety. As a follow up, UNEP, the International Labor Organization (ILO), and the World Health Organization (WHO) jointly convened an International Conference on Chemical Safety in Stockholm in 1994. This conference created the Intergovernmental Forum on Chemical Safety (ICFS) and was considered to be its first meeting.⁵² The forum has met every three years since then. Despite its designation as "intergovernmental," its structure includes both public (state-based) representation and participation from industry actors.

A related approach is the work toward developing a Strategic Approach to International Chemicals Management (SAICM). The UNEP Governing Council took up this issue beginning in 1995, with UNEP Governing

Council Decision 18/12, suggesting that the UNEP Executive Director organize a group of experts to recommend international measures to reduce the risks of a set of chemicals. UNEP convened such a group in 1996. It pointed to four sets of problems with chemicals management that deserved attention: the lack of capacity in developing countries to deal with hazardous chemicals and pesticides, the problem of disposing of chemicals and pesticides that were no longer wanted, the inadequacy of information for decision making on chemical management, and the possibility that some chemicals should be phased out altogether.⁵³

Environmental organizations had been pushing, in the creation of these various chemicals management schemes, for a system that would require actual notification before hazardous chemicals were traded. Though they did not succeed in including a PIC system or even one that required simple notification in any of the initial international regulatory processes, they had pressured individual governments to adopt such policies. Some – most notably the Netherlands, the United States, Canada, Japan, and eventually the European Community – were developing national regulations that restricted international trade of domestically banned substances, required notification to importing parties, and in some cases, actually would require PIC. These environmental groups joined developing states in pressuring UNEP and the FAO to create a standard system, building from existing regulations, that would better regulate trade in chemicals internationally. In 1989 these two UN institutions worked together to create a voluntary PIC system. This system was officially integrated into existing schemes by amendment to the FAO Code of Conduct and the UNEP London Guidelines.

This voluntary process worked by creating a list of chemicals subject to PIC; anyone trading them across borders was encouraged – but not required – to obtain informed consent before shipping. For each of the listed chemicals, the secretariat of the process prepared a Decision Guidance Document (DGD) that summarized the available scientific information on the hazards of that substance. The DNAs were then charged with creating an “Importing Country Response,” indicating whether that state allows imports of that substance. This information was disseminated to all DNAs.

The list of chemicals was created by the FAO/UNEP Joint Group. They first had to decide what criteria to use (based on national actions with respect to chemicals) for inclusion on the list. While existing regulatory processes and databases should have been useful for this process, they were not used for a variety of reasons: industry opposed the use of the UN Consolidated List, and IRPTC had not used consistent definitions in collecting its information. The list was therefore created from scratch, based on chemicals that were subject to bans, severe restrictions, rejection, and withdrawal in individual countries. Under the system an initial list of

chemicals subject to PIC was created, and after that point, any time any one state enacted control measures for a new chemical it would be added to the list requiring PIC. By the late 1990s, there were 38 substances listed in the PIC list.⁵⁴

Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

There are some advantages to a nonbinding regulatory system. David Victor argues that the voluntary PIC system allowed for flexibility. Since states knew they could avoid using the system if it produced regulations with which they disagreed, they were willing to leave the specifics of the process to experts.⁵⁵ Pesticide and chemical manufacturers also resisted regulation of any sort, particularly any binding international rules, so the creation of nonbinding rules lessened potential opposition. But many of the non-state actors that pushed for the creation of the nonbinding system really hoped for a binding agreement, and many developing countries agreed. Even as the process of regulation under the voluntary system was being created, preparations were underway for negotiation of a binding agreement.

In 1994, shortly after the Rio Conference, the FAO Council delegated to the FAO Secretariat the job of preparing a draft Prior Informed Consent (PIC) Convention. UNEP's Governing Council decided in 1995 to authorize the UNEP Executive Director to work with the FAO to convene an Intergovernmental Negotiating Committee (INC) to work toward a legally binding PIC agreement for chemicals management.⁵⁶

The negotiations were held between 1995 and 1998. The process centered on how extensive the trade prohibitions would be. Developing states argued that chemicals prohibited domestically in developed countries should not be allowed to be sold or transported to developing countries, regardless of the domestic regulations in the importing countries, a provision others successfully opposed. There was also a question of whether, as proposed by the European Union, the agreement should take a Convention/Protocol format, allowing for protocols to address specific chemicals later. Many of the non-European industrialized states, foremost among them the United States, Canada, and Australia, argued against, and prevailed. Additional disagreements arose over the extent of information that would be required to be sent with a traded chemical.⁵⁷ The final decision was that exporters would "ensure adequate availability of information with regards to risks and/or hazards"⁵⁸ and to follow restrictions applicable in their own state, but that the agreement would not create a set of harmonized rules for transmission of information. Negotiations that produced the Rotterdam Convention on the Prior Informed Consent

Procedure for Certain Hazardous Chemicals and Pesticides in International Trade were completed in 1998.

The Rotterdam Convention essentially made the previous voluntary PIC process into a binding one, though there are a few changes. Unlike the voluntary agreement, under Rotterdam two (rather than one) state control actions, from states in different regions, are required for a chemical to be included in the list of substances requiring PIC.

Under the agreement, states may only export a chemical from the list of controlled chemicals (listed in Annex III) upon receiving consent from the importing state. All parties must inform the convention secretariat of any domestic regulations they have pertaining to toxic chemicals. All member states also declare, for each listed substance, whether they refuse under any conditions to accept shipments of that chemical, consent in general to import of that substance, or consent under certain circumstances. States that wish to export chemicals must abide by the decisions of potential importers about whether to accept these chemicals.

In an interesting effort to ensure consistency with World Trade Organization rules against discriminatory trade, the agreement requires that states that refuse all imports of a specific substance under the agreement also stop producing it domestically (and may not import the substance from a state not party to the Convention).⁵⁹

The agreement also calls for states with advanced regulatory programs to provide technical assistance and help with capacity building in those states with less advanced regulatory programs, but it does not specify a process for this assistance. The lack of a specific funding mechanism in the agreement was controversial.⁶⁰

The agreement entered into force in 2004. UNEP and the FAO together provide secretariat services for the agreement; as a result the Secretariat for the Rotterdam Convention is located both in Geneva and in Rome, though primary secretariat activities are now conducted jointly with the Basel and Stockholm conventions in Geneva. The COP is the main decision-making body for the institution, but the bulk of the regulatory work is conducted in committees. An open-ended work group has been created to work toward a noncompliance procedure. As of mid 2023 there were 165 parties to the convention. The United States has signed, but not ratified.⁶¹

The most important of these committees is the Chemical Review Committee, which recommends to the COP whether chemicals will be listed in Appendix III. Members of this committee are “government-designated experts in chemicals management” appointed by the COP. States propose the listing of chemicals or pesticides in Appendix III by submitting specified documentation. The secretariat also collects information on how states have regulated the proposed chemical, what evaluations of its risks have been done, and other information specified by the Chemical Review

Committee. The Committee reviews this information in order to make a recommendation to the COP about whether a chemical should be listed, based on a set of criteria specified in Appendix II (for chemicals) and Appendix IV (for pesticides). The Conference of the Parties chooses, by consensus, whether to accept the committee's recommendation.⁶² Before the agreement entered into force, an Interim Chemical Review Committee created by the negotiation process was designated so that the process of reviewing chemicals for inclusion on the list could begin. In 2004, after the treaty entered into force, the first Conference of the Parties made the interim decision binding.⁶³

There are some concerns about how well the system set up under Rotterdam functions in reality. For instance, the trade provisions require much less documentation than do other efforts (such as CITES; see Chapter 3) to regulate trade for environmental purposes. There is no requirement that the manufacturer of the chemical be identified, nor the exporter, shipper, route, state of import, or importer. Unlike many international agreements (including others, like the Basel Convention, addressing trade in hazards) it does not prohibit trade with non-parties, and it does allow for export without prior informed consent in a set of circumstances deemed "exceptional;" these primarily involve the presumption of consent based on previous behavior.⁶⁴ For chemicals banned or severely restricted domestically but not listed on Annex III, the PIC requirements are also relaxed, requiring export notification but not actual consent.

One of the biggest controversies since the treaty began being implemented has been its inaction on chrysotile asbestos, an insulating substance that causes lung cancer. Its possible inclusion on Appendix III was debated in COPs beginning with the third in 2006, but even as of COP-11 in 2023 the COP agreed that chrysotile asbestos met the conditions for being listed on the Appendix but nevertheless could not reach consensus on doing so.⁶⁵ Canada, a major exporter of the substance, played a particularly important role in preventing it from being listed but dropped its opposition in 2012.⁶⁶

An additional fear is the central involvement of the chemical industry (in developed countries) in the evaluation process of the regulated chemicals and pesticides. Much of the information about the hazards of chemicals comes from the producers of these substances, whose interests do not lie in restricting their use. Similarly, the chemicals are often tested under climatic and operational conditions in the developed countries in which the manufacturers operate, conditions that may not be relevant to the developing countries to which these substances may be exported.⁶⁷

The Rotterdam Convention faces an uphill battle. The global chemicals trade has grown dramatically in recent decades, is expected to double from 2017–2030, and has a predicted increase in sales estimated to be

about 3% per year through 2050.⁶⁸ Production and consumption of these chemicals is shifting from the developed world to developing states.

Review processes are adding substances to the regulatory lists. By mid-2023, 54 pesticides and industrial chemicals were included.⁶⁹ The new cooperative framework with the other hazards conventions (discussed further in Chapter 7) allows for the Chemical Review Committee meeting to be held back to back with the Persistent Organic Pollutants review committee, which allows for overlap both in substances and expertise. And it is clear that there is, in fact, more transparency throughout the regulatory process for chemicals and pesticides, and that the processes of trade in these substances has been influenced by the treaty.⁷⁰ The regulatory process is nevertheless sufficiently new that there has been little overarching review of how well it has been implemented, and how successful these approaches are in reducing the dangers from chemicals and pesticides.

Strategic Approach to International Chemicals Management (SAICM)

A broader nonbinding process to address governance of chemicals was adopted in 2006 at the International Conference on Chemicals Management in Dubai, convened jointly by UNEP, the Inter-Organization Programme for the Sound Management of Chemicals (IOMC), and the Intergovernmental Forum on Chemical Safety (IFCS). One of the important aspects of this process is its multi-sectoral approach, involving governments, representatives from the chemical industry, and nongovernmental organizations. The SAICM's initial focus was on the 2002 WSSD goal on production and use of chemicals by 2020 in ways that avoid environmental and health damage. Since 2020 the organization has been engaged in a negotiation process for a post-2020 instrument for the sound management of chemicals, which had not been finalized by the negotiating meeting in March 2023.⁷¹ The organization also includes a program for capacity building in developing countries, and a continuing process of review. UNEP serves as the secretariat for this process.⁷²

Stockholm Convention

Some chemical pollutants are particularly dangerous because they are long-lived in the environment. Of special importance are those that bioaccumulate – that accumulate in the fatty tissue of organisms and become more concentrated as they are ingested continually up the food chain. They can cause cancer, disruptions of the immune and endocrine systems, birth defects, and other health problems. A set of these chemicals, called

persistent organic pollutants (POPs), have been discovered to travel long distances in the environment from where they are manufactured or used. One of the major signals of the severity of this environmental problem came with the discovery that Inuit peoples in the arctic circle had concentrations of polychlorinated biphenyls (PCBs) in their tissues far exceeding safety standards, though these people had never used such substances. POPs also affect wildlife. These substances travel both in the food chain and in the air in vapor form (when exposed to higher temperatures) and are particularly likely to be deposited in cold areas.⁷³

The efforts to regulate persistent organic pollutants built upon many of the preceding regulatory processes for chemicals that also produced the Rotterdam convention, as well as domestic regulatory efforts in some states. Beginning in the 1990s, some individual states and regional organizations had taken steps to regulate the use of some POPs. The Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention) included a ban on dumping POPs into the North Sea. The Helsinki Commission, overseeing the Convention on the Protection of the Marine Environment of the Baltic Sea Area (1992), has made a number of recommendations that states limit their discharges of a number of persistent organic pollutants.⁷⁴ The United States and Canada agreed to control POPs in an effort to protect the Great Lakes from chemical pollution, and Mexico joined the other two in a Resolution on Sound Management of Chemicals as part of the North American Agreement on Environmental Cooperation (the NAFTA environmental side agreement).

UNEP Governing Council Decision 18/32 in 1995 called for a process involving the Inter-Organization Program on the Sound Management of Chemicals (IOMC), the Intergovernmental Forum on Chemical Safety (IFCS), and the International Program on Chemical Safety to begin a process of assessing 12 initial POPs. The IFCS then convened a special *ad hoc* working group to create a process for evaluating these chemicals. This working group held a meeting of experts in 1996 in the Philippines, which concluded that there was enough evidence to regulate these substances internationally.⁷⁵

The official process of creating the treaty came with a UNEP Governing Council resolution in 1997 accepting the findings on POPs from the 1996 IFCS special session.⁷⁶ The Governing Council resolution included the direction to form an Intergovernmental Negotiating Committee (INC) to negotiate a treaty specifically on POPs with an initial focus on the 12 previously identified substances. The goal was to negotiate a treaty by 2000.⁷⁷

Before negotiations began, UNEP held regional workshops in eight locations, focusing on concerns of developing countries about what a POPs agreement could mean for them. These workshops are credited with

increasing awareness of the problems of these substances and making negotiators aware of the concerns of states that would be impacted by the regulations.⁷⁸ UNEP also made sure to provide funding for developing country officials to attend the negotiation sessions, and held two of the five negotiations in Africa to increase the involvement of developing countries. The negotiations themselves were held beginning in 1998. The Stockholm Convention on Persistent Organic Pollutants was open for signature in 2001, and entered into force in 2004. As with the Rotterdam Convention, the Intergovernmental Negotiating Committee continued to meet after the agreement was completed, to oversee the transition to a functioning agreement before it entered into force.

The negotiations were more contentious than anticipated, in part due to different approaches. Developed states, influenced by the POPs Protocol to the Convention on Long-Range Transboundary Air Pollution, discussed below, considered the issue to be primarily about long-range transport. Developing states were more concerned about issues of local management.⁷⁹ The major controversy, however, came over the regulation of DDT. Some developing countries in malaria-prone areas were especially concerned about the inclusion of DDT, the most effective insecticide used against mosquitoes, on the list of substances to be controlled under the agreement.

Nongovernmental organizations were also deeply involved in the negotiations; they were officially included as observers in the negotiations, which gave them access to the decision makers involved in the process. A number of health and environmental NGOs organized themselves into the International POPs Elimination Network (IPEN) in order to coordinate efforts and were joined by other major environmental NGOs. IPEN and most of the other environmental NGOs advocated the principle that the convention should seek to eliminate, rather than to manage, POPs.⁸⁰

The treaty initially addressed the 12 substances that had been the focus during the negotiations. Eight of them are pesticides: aldrin, endrin, dieldrin, chlordane, DDT, heptachlor, mirex, and toxaphene. Two are industrial chemicals: PCBs and HCBs. The final two, dioxins and furans, are the byproducts of industrial activity or waste incineration.

The substances to be controlled under the treaty are listed in Annexes. Annex A lists the substances whose use and production is scheduled to be eliminated. (There are special procedures for PCBs, listed in this Annex, to account for the extent of their use in existing electronic equipment, allowing a phasedown rather than requiring immediate elimination of equipment in which they are a component part.) Annex B lists substances whose use and production is restricted but not prohibited altogether. Initially the only substance listed on Annex B was DDT (though perfluorooctane sulfonic acid (PFOS) and related substances were added in 2009),⁸¹ and some specific arrangements are made in this annex for DDT.

Annex C lists regulated chemical byproducts. The other annexes elaborate information on the persistence and other chemical properties of regulated chemicals and socioeconomic considerations for regulation.

Under the agreement states are required to prohibit or eliminate production and use of substances listed in Annex A. States are, however, allowed to designate “specific exemptions” for use of substances listed in this Annex. Parties must restrict production and use of substances listed in Annex B. States can register for exemptions to these restrictions as well. The secretariat maintains a list of the exemptions, which must specify the country, purpose, and length of time for the exemptions. These exemptions are subject to review by the COP and are scheduled to end five years after the treaty’s entry into force. In addition, states may only register exemptions at the point of becoming a party to the agreement (or before); states are thus not free to create new exemptions at any point in time. In another move to limit the use of the exemptions process, once all exemptions have been removed for a specific substance and purpose, no new ones may be entered. The agreement creates a separate process of exemption for DDT, listed on Annex B. This chemical may only be used for disease vector control following WHO guidelines, and only then “when locally safe, effective and affordable alternatives are not available to the Party in question.”⁸² A separate register of DDT exemptions is kept. The process allows for flexibility in obligations (including differentiation between obligations of states) without having to formally write the differentiation into the agreement or create a process for amending the agreement to account for it. As of mid-2023, 18 states still maintained exemptions for production or use of DDT. Several states – China, Morocco, and Myanmar – have removed their exemptions to DDT and ceased using or producing it.⁸³

The agreement also includes a controversial provision for other exemptions from obligations for certain critical uses of POPs, such as for research and development or use in location-limited production of other substances.

It also limits trade in controlled substances. For those chemicals for which a relevant trading partner has not registered an exemption, parties may not export chemicals listed on Annex A or B to any state, whether it is a party or not, unless the export is for “environmentally sound disposal.”⁸⁴

Parties must also undertake measures to decrease or prevent releases of listed chemicals unintentionally produced (listed in Annex C) by developing national plans to identify current and projected releases of these substances and elaborating strategies to minimize the release into the environment of these substances. Though some in the negotiations had proposed creating specific timetables for reductions of these by-products by certain amounts, others opposed it, and such a measure was not included in the final agreement. Similarly, states must ensure that existing stockpiles of chemicals listed on Annexes A or B (including wastes) are

property disposed of, though the treaty does not create a specific process by which this would be ensured.

There are a number of obligations for parties to gather and report information. States are required to develop their own implementation plans within two years of joining the agreement, which must be reported to the Secretariat of the agreement, and periodically reviewed and updated. They must also provide regular reports on their production, import, and export of controlled substances and lists of states to which these substances have been exported or from which they have been imported. Though the agreement creates no standing scientific body, states are required to conduct research, including cooperatively, and to report the results and data from this research.

The agreement is administered by a Secretariat under the auspices of UNEP; since 2015 this has happened jointly with the Basel and Rotterdam secretariats. The headquarters of the agreement is in Geneva. The treaty process is governed primarily by the COP, with all member states represented and having equal voting rights. Any party may propose the addition of a substance to one of the annexes. These proposals are given to the Persistent Organic Pollutants Review Committee, consisting, as specified in the convention, of "government-designated experts in chemical assessment or management," with equitable geographic distribution.⁸⁵ Decisions in the Committee can be made by approval of two-thirds of the members voting. If the committee is satisfied that the pollutant meets the criteria elaborated in Annex D, it forwards the proposal and its evaluation to the Parties to the agreement and ask for information specified in Annex E on the socioeconomic impacts of control measures and alternatives. The Committee may then decide to submit the chemical and all gathered information to the COP, which will decide whether to include it in one of the annexes.

A decision by the COP to add a substance to an appendix requires a three-fourths majority vote. The treaty specifies that the COP should make this decision in a "precautionary manner." Once the COP has decided to add a substance, the parties are all bound by its inclusion, unless they opt out. To do so they must give notification within a year of the adoption that they do not intend to be bound by the new provision. In an unusual process, however, states may instead declare, when joining the agreement, that any changes to the Annexes require its affirmative ratification, rather than becoming binding if the state does not opt out. At least 18 parties have chosen this requirement.⁸⁶

One of the contentious issues in the negotiation process was the specification of a funding mechanism. Under the agreement, developed states agree to "provide new and additional financial resources to enable developing country Parties and Parties with economies in transition to meet the agreed full incremental costs" of implementing the agreement. Developing states

preferred a funding process focused solely on the problem of POPs, out of concern that the Global Environment Facility (GEF) had too broad a focus and that funding would become diluted across the many issues for which it provides funding. Nevertheless, the treaty specifies the GEF as the interim funding mechanism,⁸⁷ and the first meeting of the Conference of the Parties in 2005 affirmed the continuing status of the GEF as the funding mechanism for the agreement. At the same time, however, the COP asked for the creation of a Memorandum of Understanding between the GEF Council and the Stockholm Convention COP to assist cooperation.⁸⁸

Initial worries that the treaty would take a long time to enter into force did not come to pass; it entered into force in May 2004. As of mid-2023 there were 186 parties to the Convention, the United States (which signed in 2001) not among them.⁸⁹ Lack of US participation is worrying because of its major role in producing persistent organic pollutants. Most parties submitted National Implementation Plans (one of the requirements of the agreement), though some were late or are still missing⁹⁰; the majority of these plans were done with GEF assistance.⁹¹ Parties are also supposed to review and update these plans on a regular basis. The GEF, beginning in 2021, funded a capacity-building project to review and help states update these plans. New chemicals have been listed – there are now 31 chemicals regulated⁹² – but there are concerns that this review process takes too long and is beholden to the interests of chemical companies.⁹³

It can be difficult to determine the overall environmental effect of the treaty. The Conference of the Parties put in place a process (mandated in the treaty) for evaluating the effectiveness of the agreement, which resulted in the creation of an Effectiveness Evaluation Committee. It conducted a first evaluation covering the period between 2010 and 2017, and a second one considering the period through 2023. Both evaluations made strikingly similar findings. First, a major difficulty has been, and continues to be, the lack of data from national implementation plans and reports. Second, levels of POPs whose regulation preceded the treaty had declined and continued to stay low, and those newly regulated by the treaty processes had mostly (with some exceptions) begun to decrease.⁹⁴

Most important is evidence that the global concentrations of some POPs are decreasing. Lower concentrations have been found in air, fresh-water fish, soils, and in arctic plants and animals.⁹⁵ Although these decreases may not be attributable only to the Stockholm Convention's provisions, they are certainly part of the broader effort to eliminate the use of these substances. A global survey on the concentration of persistent organic pollutants conducted jointly by UNEP and the World Health Organization (WHO) in 2013 found a decrease in the level of certain pesticides controlled under the Stockholm Convention in human milk, an important indicator of their concentrations and potential health effects. A decrease in these levels is a notable accomplishment, though in many places the

levels of some of these compounds, as well as DDT, are still above the safety standards set by WHO.⁹⁶ This study also demonstrated the adverse effects on health from high levels of these substances, suggesting the importance of the task the Stockholm process faces.

Additional Regulation of POPs

The Convention on Long-Range Transboundary Air Pollution (see Chapter 5) has also addressed the regulation of persistent organic pollutants via a protocol. The Protocol on Persistent Organic Pollutants was first discussed within CLRTAP beginning in 1989. Negotiations began on a protocol in 1994 and entered into force in October 2003. As of mid-2023 there were 34 parties.⁹⁷ Because it is a Protocol to an existing convention, it is governed by the CLRTAP decision-making process rather than creating its own institutional structure.

The Protocol lists controlled substances. An initial sixteen were included in the agreement, and a process was created to evaluate substances for possible future inclusion on this list. Seven new substances were added by a 2009 amendment, which entered into force in early 2022.⁹⁸ Substances are listed in different annexes. Annex I includes pesticides and industrial chemicals that are to be eliminated completely, including existing stockpiles, which need to be destroyed in an environmentally friendly way. Annex II lists pesticides and industrial chemicals for which use is restricted. There are some exceptions to the restrictions for those substances listed in Annexes I and II if they exist in small quantities. Other annexes involve reduction timelines for specific substances or address emissions from stationary sources and the use of best available technology for this purpose.

Minamata Convention on Mercury

Another recent effort to address hazardous pollutants is the Minamata Convention on Mercury. Mercury is naturally released from the environment through geologic processes, but human uses, both intentional and incidental, have dramatically increased its release. Although early uses of mercury (such as in thermometers) took place before its toxicity was understood, it is now clear how destructive it is to human and animal health.

A move toward international regulation began with a UNEP study of the global effects, undertaken at the behest of the United States, which it presented to the Governing Council in 2003. Norway, Switzerland, and the EU then led the call to negotiate a treaty to address this problem. Some, including the United States and Canada, resisted the call for a binding agreement, urging voluntary reduction in mercury use instead, in large part because of the proliferation of new agreements

addressing hazards. In response, UNEP created a Global Mercury Partnership Program in 2005 to work for voluntary reductions. But by the time the SAICM was developed in 2006 and public attention to mercury had increased in the wake of the UNEP assessment, developing countries joined the European call for a binding agreement, perhaps in the context of a heavy metals agreement more broadly, which would also have included lead and cadmium. Eventually the UNEP Governing Council agreed to move forward on negotiations of a binding treaty on mercury, but not the other two metals. This move was aided politically by the change in US Presidency from George W. Bush to Barack Obama, and in a context in which US domestic regulation had recently set stringent mercury controls.⁹⁹ The negotiation process resulted in a 2013 agreement.¹⁰⁰

The resulting treaty focuses on the life cycle of mercury, attempting to protect people and the environment from mercury as it is extracted, traded, emitted, and otherwise released. The activities primarily responsible for mercury emissions are gold mining and coal burning, with nonferrous metal production and cement production accounting for smaller but still important sources of emissions. At the time the negotiations began, estimates suggested that 2000 tonnes of mercury were released annually into the atmosphere and another 1000 tonnes into the water.¹⁰¹

Although the possibility of a ban on mercury mining was discussed at the negotiations, China, responsible for 73% of mercury extraction,¹⁰² resisted such a call. The compromise that resulted prohibits any mining of mercury begun after the treaty enters into force and allows existing mining operations to continue for 15 years after a state ratifies the treaty.¹⁰³

The question of trade in mercury – whether to allow it at all, or how to regulate it if allowed – was also controversial in the negotiation process. Under the eventual agreement, trade is tightly restricted, with exports subject to a prior informed consent (PIC) process in which an importing country must explicitly consent and trade can only be imported for environmentally sound “interim storage,” or explicitly permitted uses. States may also issue blanket statements that they will never accept imports of mercury.¹⁰⁴

Uses of mercury are also strictly regulated. After a debate over whether to use a process that banned all uses of mercury unless specified or one that allowed all mercury use except in specified cases, the compromise was a hybrid process that specifies accepted or prohibited uses, along with phaseout deadlines, in a set of annexes. Products that contain mercury are addressed in Annex A. Part I of that annex lists types of mercury-containing products that must be phased out by (and cannot be traded after) 2020. Parties are allowed to register a five-year exemption, renewable once, to the phaseout of these products. Part II of that annex addresses mercury-added products (at this point, only dental amalgams) “subject to

restriction”; states may continue to use mercury in this context but must make plans to minimize and decrease its use.

Manufacturing processes that use mercury are addressed in Annex B. Processes listed in Part I of that annex listed require phaseout by a specific date (currently listed are chlor-alkali production by 2025 and acetaldehyde production by 2018), allowing for the same five-year exemption, renewable once, as in Annex A. Processes listed in Part II require specified scheduled reductions of use, relative to a 2010 base year. Some uses of mercury, such as in vaccines (as a preservative) and in traditional religious practices, military uses, and in processes in which there are no available substitutes, remain permissible.

These annexes may be amended by proposal from member states with the vote of three-quarters of the parties (although the convention aims to do so by consensus); amendments to the annexes become binding on all parties unless they have, when ratifying the agreement, submitted a notification that changes to the annexes require that party’s individual ratification.¹⁰⁵

Mercury emissions from small-scale gold mining, the greatest source of mercury, are addressed in Annex C of the agreement. While there are no specific prohibitions or timetables, states with more than minimal amounts of this type of mining are required to create national action plans. These action plans require assessing the extent of mercury use in this industry and creating strategies to reduce and eventually eliminate specific practices in gold mining that use mercury and decreasing dangerous environmental and human health impacts from the use of mercury in gold mining.¹⁰⁶

Atmospheric emissions, which primarily come from coal burning, are in many ways the most important international sources of mercury and also were the most difficult to address in the negotiations of the treaty. China and India are the largest source of these emissions¹⁰⁷ and resisted binding emissions reductions. Instead, any new sources of mercury emissions are required to use Best Available Technology (BAT) and Best Environmental Practices (BEP) at the time of their construction to control mercury emissions. For existing sources, states must pick among a set of measures within ten years of the treaty’s entry into force to control emissions, “taking into account its national circumstances, and the economic and technical feasibility and affordability” of the measures and must inventory its emissions within five years.¹⁰⁸ Similar processes apply to other environmental releases (such as to land or water) of mercury.¹⁰⁹

As of mid-2023, 144 states have become parties, and the treaty entered into force in 2017.¹¹⁰ The United States was an early adopter, an unexpected participant given its nonparticipation in the other agreements examined in this chapter and its recent domestic unwillingness to take on international environmental obligations, discussed further in Chapter 7.

In this case, then-President Obama made the argument that, because the treaty would not require any new legislation from the United States to implement the treaty, it could be accepted without the formal ratification of Congress.¹¹¹

There is some evidence that the treaty and earlier regulation have started to make a difference in both emissions and environmental levels of mercury, though climate change is likely to re-expose legacy mercury pollution¹¹² so overall harms from mercury are likely to continue. Although its most stringent standards are not in the areas responsible for most mercury emissions, the treaty creates a strong process for control of some sources of mercury and the beginnings of a process to oversee decreases in existing emissions and prevention of new sources of emissions.

Toward a Plastics Treaty

The newest effort to address toxic materials that travel internationally pertains to plastic. Plastic is made from petroleum, along with various additives, some of which are toxic. It is an extremely flexible substance that can be both lightweight and strong; it has come into widespread use since the 1950s and persists in the environment. Microplastics, tiny particles that break down from the use and degradation of larger plastics, are found everywhere scientists have searched – in ecosystems far from where plastic has been used and in the bodies of most animal species, including all people.¹¹³ One place plastic pollution has gained international attention is in the oceans, with the discovery of “garbage patches,” large accumulations of plastic within gyres in different oceans around the world. The best known of these, in the Pacific Ocean, is estimated to be at least 1.6 million square kilometers in size, containing 80,000 tons of plastic debris.¹¹⁴

In 2015, researchers estimated that 275 million tonnes of plastic was generated annually in coastal countries, of which between 4.8 to 12.7 million tonnes entered the oceans; they anticipated an order-of-magnitude increase by 2025 if significant changes were not made.¹¹⁵ A comprehensive study in 2017 estimated that since 1950, 8.3 billion tonnes of plastic had been produced in the world, of which 6.3 billion tonnes still existed as waste.¹¹⁶

Many localities, and a number of countries, have taken steps to reduce plastic, though many of these focus only on small-scale single-use plastics like utensils, straws, or bags. Plastic pollution is worldwide and requires a collective solution, since both plastic materials and plastic wastes move internationally. NGOs and activists had called for global action for more than a decade. An important turning point came in 2018. Up to that point, China was the world’s largest importer of plastic waste, for recycling, accounting for nearly half of the world’s trade in this material.

China announced at the end of 2017 that it would ban the import of plastic waste altogether, which threw the world's trade in recyclable plastic material into disarray.¹¹⁷

The UNEA created an expert task force ("Ad-hoc Open-ended Expert Group on Marine Litter and Microplastics") in December of 2017; it met four times between 2018 and 2020. Despite its charge, the Expert Group took the initiative to broaden its scope by looking not just at marine plastic waste and microplastics but also the supply chain of plastics. This effort contributed to the inclusion of some types of plastic waste as hazardous under the Basel Convention; at the same time other international organizations – the World Trade Organization, the Strategic Approach to International Chemicals Management, and the World Health Organization among them – took up the issue of plastic pollution. In 2021 the task force proposed working toward negotiation of a new treaty to address the issue. In March of 2022 the UNEA adopted a resolution calling for the negotiation of an internationally legally binding instrument to address the problem of plastic pollution.¹¹⁸

The International Negotiating Committee this process created has been working since November 2022, with a goal of completing a treaty by the end of 2024. At the time this book goes to press there is little agreement about the ultimate focus and form of the treaty. Initial negotiations have been contentious, so it is difficult to make predictions about the details of an eventual agreement, but the fact that there is agreement about negotiating a legally binding treaty on the topic is an important starting point.

Conclusions

Institutions governing transboundary movement of toxics are relatively new (compared to many of the issues addressed in the rest of this book) and involve potentially conflicting concerns of developed and developing states. Early experience suggests that these institutions have thus far had some impact on the ability of developing states to implement their complex preferences – to avoid receiving hazardous waste or to continue to use DDT for malaria control – but have not, as yet, fundamentally changed the way developed states generate waste or work with toxic chemicals and pesticides. Nevertheless, the Rotterdam and Stockholm conventions have begun to show signs of effectiveness, and signs of ecosystem improvement are especially encouraging. The Minamata convention has likely changed state behavior with respect to mercury, and the efforts to negotiate a new plastics treaty demonstrate that states are continuing to strengthen and expand the institutions in this issue area as they learn from the difficulties of protecting global populations and ecosystems from hazardous substances.

Notes

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- 9 UNEP Governing Council Resolution 10/24, 31 May 1982.
- 10 UNEP Governing Council Resolution 14/30, 17 June 1987.
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- 14 Basel Convention Articles 5 and 6.
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- 21 David Downie, Jonathan Krueger, and Henrik Selin, "Global Policy for Hazardous Chemicals," in Regina S. Axelrod, David Leonard Downie, and Norman J. Vig, ed., *The Global Environment: Institutions, Law and Policy* (Washington, D.C.: CQ Press, 2005), 130. There are some differences between the original decision and the Ban amendment. For instance, the OECD categorization is not

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7 Emerging Issues and Future Directions

Though this volume cannot cover every aspect of global environmental institutions, it concludes by discussing three issues that are becoming increasingly important. The role of funding has become essential in the negotiation and implementation of international environmental agreements, and even existing institutions have been adding funding mechanisms to their operations. One central organization, the Global Environment Facility (GEF), has become the main process for allocating funding to address global environmental problems.

A second issue is the participation of the United States in global institutions addressing environmental issues. The United States is, for many issues, one of the most important current contributors to many environmental problems, and, as the world's wealthiest and most politically powerful state, it is essential to processes to address international environmental issues. Yet the United States, despite its early history of leadership on international environmental issues, has refused to take on many recent international obligations. Figuring out how to entice the United States into global environmental governance is thus a key concern.

This volume concludes with the broader question of the implications for governance of the many and overlapping institutional structures created to protect the environment. The environmental issue area is unusual internationally in the extent to which its governance is decentralized. With no central environmental institution (and UNEP at best playing a coordinating role), the governance processes created inevitably duplicate effort or pursue contradictory goals. How, and how successfully, has the system worked with, or around, this institutional complexity?

Funding

One of the major issues facing international environmental cooperation is how to pay for it. In some circumstances, environmental action can save money, through avoiding the costs of environmental degradation. These cost savings, however, tend to be in the aggregate and in the long term.

In the short term, investment in different technologies, foregoing development opportunities that would be environmentally damaging, and undertaking other environmentally beneficial behaviors, require costly investment. Similarly, even if environmental behavior can benefit a country in the aggregate it may not benefit all the substate actors in that country. The costs that are avoided from ensuring clean water do not benefit the company that must pay to dispose of its toxic waste somewhere other than the local water supply. Most environmental problems are externalities of other economic activities – the unintended (and un-priced) effects of industrial activity. That means that, at least initially, changing behavior in order to make it less environmentally damaging is likely to have a cost.

There are a variety of costs to undertaking environmental activities. These include such things as the institutional costs of setting up and running international organizations (paying for permanent staff and running an office, the travel costs to meetings, for instance) and supporting international scientific research. For most states, however, the primary costs pertain to their own domestic implementation.

Developing countries have been hesitant to accept the expenses of international environmental agreements. This reluctance is understandable. They are not primarily responsible for most of the international environmental problems that currently exist. They fear that richer states, which were the ones to create many of the current problems in their process of industrialization, now want to prevent them from industrializing using the same inexpensive and tested technologies developed states used. And developing states, often with growing populations, have many pressing problems of poverty on which their initial attentions are focused. If these states are to join international environmental agreements, they need to be persuaded that doing so is worth their while, and they may need to be assisted in developing the capacity to implement those agreements they, even enthusiastically, take on.

Global Environment Facility (GEF)

The most prominent institution for international funding to address global environmental issues is The Global Environment Facility. It was established at roughly the same time as the Montreal Protocol Multilateral Fund (discussed further in Chapter 5), to serve as a more general funding institution for environmental aid. Although there had been calls for an institutional structure for channeling funding for the environment in the World Commission on Environment and Development and in UNEP (see Chapter 2) in the 1980s, the initial creation of the GEF came out of discussions in the World Bank beginning in 1989. The bank had been asked by the German and French finance ministers to look into the usefulness of an open-ended funding mechanism for international

environmental issues.¹ It began as a pilot program in November 1990, housed in the World Bank but with involvement from other international funding institutions. The United States, which had opposed the creation of a new open-ended funding obligations, was assuaged by the promise that the new organization would not immediately be made permanent.²

What differentiates this institution from previous World Bank lending is that the aid is given primarily as grants rather than loans. World Bank funding has traditionally been premised on supporting projects that could eventually generate income so that the loans may be repaid. This approach has been problematic for issue areas such as the environment in which problems are the result of un-priced externalities, and many useful reforms would not be economically profitable. In addition, states may not be eager to take out loans to accomplish benefits that accrue primarily to the global environment. As with the Multilateral Fund, the funding is intended to cover the incremental costs to developing countries of undertaking environmental activities that do not generate net economic benefits.

The initial approach was to focus on four areas where environmental effects were decidedly international: biodiversity, climate change, ozone depletion, and international water pollution. At the 1992 UNCED conference in Rio the organization was named as the interim funding mechanism for both the UN Framework Convention on Climate Change and the Convention on Biological Diversity.

The pilot phase of the GEF was reviewed in 1993 by an independent panel (that included critics of the Bank and the GEF) commissioned by the organization. This panel pointed to a lack of participation by affected communities in GEF decision making, noted a lack of accountability, and found that the implementing agencies were not cooperating sufficiently.³ Some NGOs, most prominently Conservation International and the Natural Resources Defense Council, undertook their own evaluations of the pilot GEF. They commented on the unsuitability of general World Bank operating procedures, which had traditionally focused on large infrastructure projects, to the GEF mission and criticized the Bank for its lack of local capacity building and oversight and for projects that were "too big." They nevertheless expressed optimism that a reformulated GEF could play an important role.⁴

Responses to the official evaluation and other criticisms were mixed, but the World Bank engaged countries in negotiations about the reorganization of the GEF for its permanent, "operational" phase. As was the case in the initial creation of the mechanism, it was the tensions between the developing countries and the United States that were the most prominent in efforts to reform the GEF. Even prior to the 1993 evaluation developing countries had won concessions for their agreement to allow the GEF to become the interim funding mechanism for the UNFCCC and

the Convention on Biological Diversity, with promises that the organization would be made more democratic and transparent.

In an effort to achieve greater representation, a “participants assembly” was created to oversee GEF operations. This assembly includes representatives from all member states and from the implementing agencies and the Conventions that make use of the GEF. This assembly operates by consensus and can approve potential amendments to the underlying GEF agreement and make statements about GEF policies and goals. It meets only every four years and some have questioned its usefulness. Although it is technically the main governing body of the institution, its infrequent meeting and large size means it can, at best, set the broad direction of the organization but not play a major role in operational activities.

In addition, the renegotiation created a reformed GEF council. The new Council has 32 members – 16 from developing countries, 14 from developed countries, and two from countries with economies in transition (the former Soviet bloc), with each group allowed to determine how representatives would be chosen. It meets twice a year to approve the work programs and projects necessary for implementing GEF projects. Decisions require a double-majority vote, requiring the support of three-fifths of the countries on the Council as well as three-fifths of votes as weighted by contributions, though consensus is sought and generally obtained. Decisions thus require support of the largest donors and some developing country agreement. The secretariat was created as functionally independent from the World Bank. Agreement on these reforms and to make the GEF permanent came in March 1994.

Though housed in the World Bank, the GEF works with 18 different implementing organizations, such as UNDP, UNEP, regional development banks, UNIDO, and the FAO in proposing and carrying out projects. The organization also has a Scientific and Technical Advisor panel, composed of 15 experts in its focal areas, whose task it is to give advice on all scientific and technical aspects of the GEF’s work and priorities. It is coordinated by a secretariat run out of UNEP.

The funding is contributed by donors every four years in what is known as a “replenishment.” The amount of the replenishment is decided in difficult negotiations between the organization and donor states. The GEF began operations with pledges of just over \$1 billion. The first replenishment in 1994 was in the amount of \$2 billion and the amount has increased since then, with the most recent replenishment cycle (2022–2026) totaling \$5.33 billion.⁵ Funding donated for GEF projects is supposed to be “new and additional,” meaning that it represents funding from donors that would not have already been given in a different context. But the GEF has not given clear guidelines on what that means and it can be difficult to

determine whether states are indeed giving funding the GEF they would not otherwise have given.

Another element of GEF funding is that it is intended to work to leverage other funding as governments, international organizations, and private entities are asked to give additional support to GEF projects. Across the first three decades of its existence, the GEF allocated \$23 billion in funding and leveraged an additional \$129 billion in co-financing, thus making use of far more funding than is directly pledged to the organization.⁶

The involvement of NGOs in global environmental governance has been generally controversial, and nowhere more so than in funding mechanisms. The GEF resisted NGO involvement, but in 1995 decided that the advantages outweighed the disadvantages and began to allow NGOs as observers in GEF meetings.⁷ NGOs, such as the World Wildlife Fund (WWF), are now also involved in implementing GEF projects.

GEF funding has contributed to important projects in its focus areas. In its first two decades 31% of its funding went to address climate change, 30% to biodiversity, and 17% to projects addressing more than one issue. Projects are reasonably equally geographically divided across Africa and Asia (with smaller amounts going to Latin American and the Caribbean, Eastern Europe, and Central Asia, and to globally focused issues).⁸

The GEF is also specifically designated as the funding mechanism for the Convention on Biological Diversity, the UNFCCC and Kyoto Protocol, the Stockholm Convention on Persistent Organic Pollutants, the UN Convention to Combat Desertification, and the Minamata Convention on Mercury.

Most international funding to address ozone depletion takes place through the Montreal Protocol Multilateral Fund (discussed in Chapter 5). The GEF role in ozone depletion filled an important gap in Multilateral Fund operations that emerged because of the political and economic transition in Eastern Europe and the Former Soviet Union. Because the Multilateral Fund's rules require that it only fund Article 5 (developing) countries and these former Soviet-bloc states were considered to be developed countries, they were stuck in the awkward position of owing money to the Multilateral Fund for the use of developing countries while not being able to finance their own phaseout. The GEF, working within its original mandate to address ozone depletion, was able to fill this institutional gap by providing financing for phaseout projects in these countries. It allocated \$235 million (and leveraged another \$247 million) to help with the phaseout of 29,000 (ODP) tons of ozone depleting substances in this region.⁹

Funding for the protection of international waters is not connected to any particular global agreement and, as such, has involved a smaller degree of GEF funding than some other areas. The organization has

allocated over \$500 million to fund projects designed to help states work together to protect shared water resources.¹⁰ The GEF funding goes to address issues of pollution, invasive species management, and quantity of fresh water available for use. At least in part because there is no existing global agreement on this issue, this funding has gone to help states to cooperate internationally. Efforts in this area have been praised for increasing scientific understanding of threats to water quality but criticized for not requiring clear ecological improvement.¹¹

Some have been concerned about the increasing scope of GEF activities. For instance, developing countries resisted naming the GEF as interim funding mechanism for the Stockholm Convention for fear that with finite amounts of funding allocated to more and more issues and treaty processes each individual agreement would gain less. Its role as funding mechanism to international agreements has become more accepted, however, as it has increasingly taken on these roles.

The GEF conducts and commissions regular evaluations. Its own Independent Evaluation Office was created by the GEF Council in 2003, and is charged with undertaking independent evaluations of GEF functions. It reviews the overall performance of GEF activities annually, both overall and with a specific examination of funding focal areas and assesses country portfolios (effectiveness of all GEF activities within a given country) among others.¹² Every four years an “overall performance study” (OPS) provides the context for the replenishment of funds. The fifth OPS, in 2014, focused on evaluating the good that the organization had accomplished, arguing that the “GEF has a catalytic role in supporting countries in meeting their obligations to multilateral environmental agreements and in tackling global environmental problems.”¹³ The seventh such study, prepared for the 2023 GEF Assembly, indicated that 80% of the organization’s projects are rated as having “satisfactory” implementation, execution, and outcomes, and 64% are seen as being “sustainable at completion,” which the study notes is an improvement over previous evaluations.¹⁴

The institution had a rocky start. The implementing agencies themselves in 1998 deemed 12% of GEF projects unsatisfactory.¹⁵ Some early critics pointed to lack of support from both donors and recipients, and the political battles that constrained operating effectiveness.¹⁶ Some criticisms are structural: funding to support incremental costs and specific convention agendas does not address the underlying political causes of environmental degradation in developing countries.¹⁷ Importantly, the amount donor states have been willing to pledge to the organization is vastly less than what most analysts believe necessary to make real headway against global environmental problems. A deeper criticism is the argument that, although the GEF exists primarily to help developing countries, its operations primarily support the goals of the already powerful countries.¹⁸

The GEF has been praised, however, for being “innovative and adaptable.”¹⁹ And even if the funding is insufficient, it is far more than has been contributed to address most of these issues or than would be likely to be in the absence of the GEF. Early concerns that the organization was not focusing on issues of importance to developing countries should be mollified by the expansion in focus areas. Even critics generally express optimism for the potential of the GEF, a potential its more recent activities seem headed toward fulfilling.

Other Funding Mechanisms

Although the GEF is currently responsible for the bulk of financing within global environmental institutions, some international environmental agreements rely on their own sources of funding. Those negotiated since the 1990s generally include some form of funding, often the GEF. But also important is the addition of new funding mechanisms for previously negotiated agreements. The Convention on Migratory Species (discussed in Chapter 3) added a small grants program to help states implement their conservation obligations and negotiated funding mechanisms for some of the species-specific conservation agreements. The same is true of the Ramsar Convention on Wetlands (also discussed in Chapter 3). The Basel Convention on Transboundary Movement of Hazardous Wastes and Their Disposal (discussed in Chapter 6) is another agreement that began without any funding mechanism to assist with implementation and in 1999 decided to modify the Technical Cooperation Trust Fund specifically to assist developing countries in cases of emergency.

While funding in general is still often insufficient across these institutions and contributions to assessed funding imperfect, one of the most notable developments generally across global environmental institutions in recent decades is the widespread acknowledgment that funding is required to help developing countries meet the obligations these institutions impose. It is now generally assumed that new environmental obligations will not be negotiated without accompanying funding mechanisms to help developing countries implement them.

The Reluctant United States

A second major issue in global environmental institutions is how to gain participation by all relevant actors. Most of the environmental problems addressed in this volume are global, or at least international, in scope. Ecosystems rarely reflect political boundaries, and activity undertaken in one state has effects in others. Most environmental problems are (in game-theoretic terms) issues of common pool resources (CPRs).²⁰ The first defining characteristic for such issues is that they are non-excludable,

meaning that actors cannot be excluded from the good, such as the fish on the high seas. The second is that they are subtractable, meaning that the resource can be diminished by use. If one person catches a fish, it is not available for someone else to catch, and the more fish that are caught the fewer remain in the ocean to reproduce.

The issue of non-excludability means that all states can potentially affect the environmental problem. It is for that reason that environmental institutions are generally global – any state may join. If a problem can be caused by (or can affect) any state, the solution should be open to participation by any state. The issue of subtractability is even more important. It means that a state that remains outside of global environmental governance has the potential to undermine the ability of cooperative institutions to successfully mitigate an environmental problem. If most states agree to cooperate to protect fisheries, their restricting of their fishing behavior can be ineffective if a state with a large fishing fleet continues to catch large numbers of fish. In this circumstance cooperating states lose doubly: they make use of less of a resource than they would prefer to and (if others remain outside the cooperative agreement) also fail to protect the resource.

In this way environmental issues differ from other issues addressed through global institutions. Consider free trade. The World Trade Organization (WTO) operates by requiring that “most favored nation” status be given to all members of the organization – in other words, all members of the WTO must treat all other members as favorably (with respect to lowering trade barriers) as they do any members. This approach works, and serves as an incentive for others to enter the organization, because the ability to trade freely is not diminished by those who do not participate in it.

The CPR nature of international environmental problems means that it is essential to include all states that contribute, or might contribute, to an environmental problem in the institutions to address it. There are many approaches used to bring potentially reluctant states into international environmental institutions. One important one is funding, described earlier. A second approach is for institutions to provide advantages to members while excluding non-members from benefits. The Montreal Protocol prohibits member states from trading ozone-depleting substances with any state that is not a party, and most of the agreements about trading hazards allow trade only among member states or those who otherwise follow the obligations of the relevant treaties. Another tool used in the effort to achieve widespread participation is the requirement for entry-into-force of international environmental agreements. Most recent international agreements on any issue require a certain threshold of ratifications (and then a short lag time) before they enter into force, and more recent ones often require a double threshold: a certain number of states that, collectively, account for a certain percentage of the regulated behavior. This approach ensures that a treaty will not become binding until it has

the participation of a sufficient set of actors to make a difference. Underlying all of these strategies are aspects of the negotiations themselves to attempt to make an agreement attractive – or less difficult – for the states that are the most important to lure into participation.

In this context, the state whose participation in global environmental institutions has been most problematic in recent decades is the United States. But the United States is among the biggest current contributors to many global environmental problems. And although when the United States takes on environmental rules it lives up to those obligations, it has become increasingly reluctant to accept those rules in recent decades.

It was the absence of the United States from international commitments to reduce greenhouse gas emissions under the Kyoto Protocol (the United States didn't ratify the agreement) and the weakening of both that agreement and the subsequent efforts to negotiate international climate change that contributed to the ultimate decline of that agreement. The negotiation of the Paris Agreement (discussed further in Chapter 5 and below) was a specific attempt to craft an international process that would be able to bind the United States, and its nature was fundamentally determined by these constraints. Because it would be difficult for global environmental institutions to successfully address the problems they tackle without the full involvement of the United States, its behavior, and the efforts to engage it in international environmental politics, is a key consideration for the future of environmental institutions.

The United States played a leadership role in the early years of international environmental cooperation. It was a willing participant in early resource treaties (such as fisheries agreements) of the first half of the 20th century and was a leader in the first wave of negotiations of the major international environmental institutions in the 1970s. The Convention on International Trade in Endangered Species was negotiated at the behest of the United States, and the creation of the World Heritage Convention was proposed by the United States at the Stockholm Conference. The United States also initiated the negotiations that created the London (Dumping) Convention and played an important role in the negotiation of the Montreal Protocol, having undertaken significant domestic regulation to protect the ozone layer before attempting international negotiations. The United States also has a reputation for actually living up to the international obligations it takes on,²¹ unlike some other states.

But in recent decades the nonparticipation of the United States in global environmental governance has been both notable and problematic. This trend is not unique to the issue area of the environment. The unilateralism of the United States is well known across issue areas, particularly pertaining to security and human rights.

The first large-scale environmental agreement the United States refused to ratify was the United Nations Convention on the Law of the Sea

(UNCLOS), the negotiations of which were concluded in 1982. The United States expressed concern over the provisions to oversee deep seabed mining, especially those that transferred resources to developing countries, though it is notable that the United States did ratify the associated Fish Stocks Agreement. The United States has also remained apart from most of the international arrangements pertaining to transboundary movement of hazards. Despite being the largest producer of hazardous waste it has not ratified the Basel Convention or the Rotterdam or Stockholm Conventions (though, importantly, it has adopted the Minamata Convention on Mercury). It has also not signed or ratified the Convention on Biological Diversity or its Protocols, though it is the largest producer of genetically modified crops. Even though the United States did join the Paris Agreement, when Donald Trump became president one of his first acts was to indicate intention to withdraw from the agreement as soon as possible (which required some delay for the treaty to, first, enter into force, and then for the three-year delay mandated by the treaty text and a subsequent one-year wait after the notification of withdrawal).²² This withdrawal took effect just after the 2020 election that removed Trump from office, and as soon as Joseph Biden was inaugurated he took steps to rejoin the agreement.²³

What is the effect of the United States' nonparticipation in so many agreements? On a broader level the implications of the United States nonparticipation are both less and more serious than they might initially appear. The United States is still more fundamentally protective of the environment than many other states, and its behavior on many agreements in which it does not participate is often largely in accord with the requirements of the agreement. It exports only a small portion of its hazardous waste (and most of the exports go to Canada), and it is acting within the requirements of all major provisions of UNCLOS, for example.

In addition, non-ratification may mean official nonparticipation, but the United States is nevertheless clearly involved in most of these institutions, albeit in an unofficial capacity. The United States was represented at all of the meetings about how to implement the Kyoto Protocol before it entered into force and at the meetings of the parties since then. It was actively involved in the negotiation of the Paris Agreement in 2015.

But this version of participation points to the major negative impact of lack of US participation as well. Other states hope to be able to lure the United States to fully join the agreements in question. The effort to bring the United States into international governance processes can lead to a weakening of institutional obligations.

The Kyoto Protocol is an illustrative example. In early 2002 there were still five Annex I states that had not ratified the agreement: The United States (responsible for 36% of 1990 emissions), Australia, (2%), Russia (17.4%),

Japan (8.5%), and Canada (3.3%).²⁴ Some combination of these five states would have to ratify the agreement for it to meet the threshold to enter into force. In order to persuade these states to ratify, negotiations continued over how to interpret the agreement. The rules were changed in ways that substantially weakened the agreement, in order to lure the recalcitrant states into the agreement.²⁵ Japan, Canada, and Russia, the latter two with large forest areas, pushed for a redefinition of how carbon sinks (land use practices, such as forestry, that keep carbon out of the atmosphere) would be counted under the agreement. This redefinition increases the extent to which they could use and count these practices against their required reductions. Warwick J. McKibben and Peter J. Wilcoxon estimate that this change alone “reduced the overall stringency of the protocol by 54.5 million tonnes of carbon.” These obligations were relaxed even further (to an estimate of 70 million tonnes) when Russia’s sink allowance was further increased at the 7th Conference of the Parties.²⁶ Japan and Canada ratified in 2002; Russia’s ratification at the end of 2004 cleared the way for the agreement to enter into force in 2005, but not before Russia had wrested additional aid and support in its bid to join the World Trade Organization from the European Union as a condition of its ratification.²⁷ The lack of US participation in Kyoto thus clearly led to the weakening of an already limited agreement.

Why does the United States choose to remain apart from so many global environmental obligations? Uncertainty – about the severity of the problem, the costs of proposed solutions, or even whether an anticipated problem will materialize – is frequently given as a reason for US reluctance. This explanation seems unlikely, however. While it is true that some of the issues the United States has declined to address internationally – such as climate change – have large degrees of legitimate uncertainty, some (such as UNCLOS or Basel) do not. And there are issues with high degrees of uncertainty – such as ozone depletion or even early ocean protection agreements or international fisheries management – in which the United States has actively participated.

Perhaps the United States is simply concerned about the cost of regulatory action, an argument made for why it remained outside the Kyoto process. On the other hand, a comparison of the relative costs of the international environmental obligations the United States takes on with those it does not indicate no clear pattern of cost. The predicted costs of implementing the Montreal Protocol or CITES (which requires complex border control measures) were likely to be much greater than those of implementing the Biosafety Protocol or even the Basel Convention.

Another possibility is that the United States is simply making a rational assessment of the likelihood that it will be harmed by the environmental problem and prioritizing those issues that would have the greatest impact domestically. But it is not clear that the United States would suffer

more damage from ozone depletion than from climate change, or more from extinction of endangered species than from loss of biodiversity.

While there is no one answer to what determines US resistance to international environmental agreements, aspects of domestic politics are likely to play an important role in US behavior toward international obligations in general. More important than the overall cost of action to protect the environment may be action that would be costly to politically powerful industries within the United States that have the ability to influence the political process. Many attribute the US reluctance to act on climate change to the political power of domestic energy producers.²⁸ A more nuanced view of the impact of industry on US willingness to take on international environmental obligations comes from considering the US domestic political process, which has a separation between the executive and legislative branches.²⁹ The US Senate is particularly prone to pressure from special interest groups, with senators responsive to issues that affect their individual states rather than the country as a whole. The United States requires a much higher threshold for treaty ratification than almost any other state. It is one of only six states that require ratification by a supermajority of a separate branch of government for domestic acceptance of a treaty.³⁰ In recent years the increasing polarization of the United States has meant that this legislative ratification would need to come from a body that has become dramatically more conservative, especially in a context when the presidency is in the hands of the other political party.

In this context, the international environmental obligations that the United States takes on tend to be those on which the country has already acted domestically, for which international action does not pose entirely new regulatory burdens and may even create competitive advantage for regulated industries.³¹ In other words, those concerned with the US unwillingness to participate fully in international environmental institutions and the international problems this nonparticipation causes may be advised to focus on persuading it to regulate domestically, which then gives it an incentive to act internationally. Admittedly, in an era of regulatory reluctance in the US legislature, even this strategy may be difficult.

This strategy of focusing on obligations the United States has already taken on as a way to garner international environmental participation is one that US President Barack Obama began to follow toward the end of his second presidential term. He decided to submit the US acceptance of the Minamata Convention on Mercury without seeking Senate ratification (which almost certainly would not have been forthcoming, given the unwillingness of the Senate to support his international environmental policy agenda), making the argument that implementing it did not need any new legislative action so did not require ratification.³²

The negotiation of the Paris Agreement on climate change was predicated on a similar strategy. Knowing that a binding agreement of the

traditional sort would not receive US ratification in the current political climate, the agreement was intentionally crafted so that it could be argued to not have legally binding emissions reductions, allowing the United States to adopt it through executive action,³³ the way it did with the Minamata Convention.

Although this strategy provides a way to allow for US participation in global environmental institutions despite domestic disagreement, it does not erase the underlying problem of domestic political obstruction of environmental action. Without domestic support for environmental measures, including those at the local and national level that can then feed into support at the international level, the United States will not regain its international environmental leadership, making it more difficult for the rest of the world to cooperate to address these issues.

Managing Multiple and Overlapping Institutions

As should be clear by this point in the volume, institutions addressing global environmental institutions are numerous and overlapping. Within a given issue area there are multiple institutions that address different aspects of a given problem, or focus on different types of solutions. There are some advantages to this diffuse structure of global environmental governance. Redundancy in international environmental institutions provides a check against ineffectiveness in any one institution.³⁴ Innovation, a hallmark of global environmental governance, may be greater when there are many institutions addressing environmental issues in different ways.³⁵ The presence of multiple institutions focusing within an issue area may itself be a sign that they are fulfilling different roles, since each was negotiated with awareness of previously existing institutions.

But this structure creates problems as well. There is overlap in the mandates and missions of existing organizations. There is competition for scarce resources, be they money or time. Many of the institutions discussed in this volume face shortages of assessed funding, and even assessed funding falls short of needs. Professionals who address global environmental institutions have to attend too many meetings that address similar issues. Creation of a new agreement or institution may serve to appease domestic constituencies and deflect attention, without effectively addressing the underlying problems that caused concern.

The broader phenomenon of "regime complexes," a governance structure in which multiple international institutions exist nonhierarchically in one issue area, was first popularized in discussing the various institutional structures that existed for overseeing plant genetic resources.³⁶ This approach builds on a previous literature that addresses the "interplay" among global governance processes.³⁷ Scholars who examine this structure point to the inevitable competition that arises between institutions

attempting to govern the same issue, which might lead to conflict or might result in coordination and division of labor as institutions attempt to navigate this shared governance space.³⁸ This overlap also allows for forum shopping, the ability of states to choose which institution on a given issue they will use to pursue their interests,³⁹ which can further fragment governance.

There is widespread agreement that some kind of reform of the international governance of global environmental issues is necessary to address this overlap. For awhile there was call for the creation of a global environmental organization to fulfill the functions of the currently fragmented and overlapping governance role the institutions covered in this book perform,⁴⁰ but in the absence of a plausible route to the creation of such an institution (as well as arguments that it would cause a different set of governance problems),⁴¹ this discussion is no longer prominent.

Perhaps the answer to ineffective global environmental governance is to improve the governance in existing institutions, rather than to substitute a new centralized organization. Most suggest better coordination across the range of institutions. Peter Haas advocates a multiplicity of institutions that focus on different functions of environmental governance, consolidating (for example) the work of multiple monitoring organizations.⁴² How this consolidation would happen is left unspecified, however. Konrad von Moltke similarly suggests that instead existing institutions should be "clustered" in like-groupings, coordinated by issue area, instead of creating new institutions.⁴³

This clustering is already happening in some of the institutions discussed in this volume. Three of these clusters are especially notable: biodiversity/species organizations, tuna management organizations, and the institutions addressing transboundary hazards. In addition, some of the organizations addressing atmospheric issues have made strides in navigating their potentially conflicting mandates in usefully collaborative ways.

Species and Biodiversity Coordination

The earliest, and perhaps weakest, of these clusters is the cooperation among organizations working on biodiversity and species protection. CITES and the CMS regulate a number of the same species (and both include whale species also regulated under the International Convention for the Regulation of Whaling). The protected areas and ecosystems protected by Ramsar and the World Heritage Convention contribute to the conservation of biodiversity (and, in the case of the WHC, are sometimes listed for their contribution to that goal). Any agreement that results in greater space left aside for conservation will likely have a positive result for the individual species that live there.

There is increasing cooperation among secretariats of the overlapping agreements. In the late 1990s the CMS Secretariat and those of the Convention and Biodiversity and Ramsar negotiated memoranda of cooperation,⁴⁴ and CITES and the Convention on Biological Diversity have also negotiated a Memorandum of Understanding that involves joint studies.⁴⁵ Occasionally the CBD, CITES, the CMS, Ramsar, and the World Heritage Convention appear as a five points on a circle in an icon the individual organizations use on their websites, indicating that the organizations are aware of the interconnectedness of their mandates. In 2002 the organizations created a Liaison Group of Biodiversity-Related Conventions, which was updated in 2014, bringing together the heads of seven biodiversity-related organizations (the five discussed here, along with organizations for the International Treaty on Plant Genetic Resources for Food and Agriculture (2004) and the International Plant Protection Convention (1952)). The heads of these organizations have held joint retreats and share information and strategies.⁴⁶

Most of this cooperation is currently centered within the CBD. From the beginning of the CBD negotiation, the United States framed it as an institution that would help manage the overlap among the mandates of the varying species and ecosystem conservation organizations. The organization as eventually created focused less directly on these aspects and did little initially on its own to actually manage the regime complex of which it became a part, but the treaty itself gave the organization the mandate to “coordinate with other relevant bodies.”⁴⁷ The organization’s first strategic plan at COP-6 in 2002 included the goal of policy coherence across the variety of organizations working on biodiversity.

In this and many other contexts it is the UNEP connection across these institutions that help the coordination of goals. The UNEP Executive Director mentioned the 2010 target in speeches before Conferences of the Parties for both CITES and the CMS. Ultimately, then, the coordination that happens across institutions focused on different aspects of species and biodiversity conservation happens because of actors involved in more than one organization. Sometimes it is individual scientists or representatives of governments who attend COP meetings for more than one conservation institution, and in other cases it is the fact that UNEP plays the secretariat role for the most important of the conservation institutions. The goal is to “to maximise effectiveness and efficiency and avoid duplication of effort” in the activities of member organizations.⁴⁸ It is clear at this point that there is regular communication among these organizations and that almost certainly contributes to greater awareness of synergies or potential conflicts. It is less clear whether this communication has yet resulted in specific benefits to biodiversity and species conservation.

Tuna Management

A slightly deeper collaboration has happened among the Regional Fisheries Management Organizations (RFMOs) that manage tuna and tuna-like species. There are five such organizations: International Commission for the Conservation of Atlantic Tunas (ICCAT), the Indian Ocean Tuna Commission (IOTC), the Western and Central Pacific Fisheries Commission (WCPFC), the Inter-American Tropical Tuna Commission (IATTC), and the Commission for the Conservation of Southern Bluefin Tuna (CCSBT). Although for the most part they divide their regulatory mandate by geographic area and thus don't technically overlap, the fishers who catch the tuna are able to move from one ocean to another, and there is evidence that they do so in response to regulations from the RFMOs. In other words, tuna vessels prevented by regulation from catching in one area may then move to a different area where the catch is less restricted.⁴⁹

These five organizations came together beginning in 2007 with a joint meeting in Kobe, Japan; for that reason this collaboration is often called the Kobe Process. At that initial meeting they negotiated a "course of action" for collaboration, focusing primarily on exchange of scientific information and collaboration on illegal fishing. Specifically the initial agreement called for harmonizing catch documentation and tagging systems and transshipment controls, standardizing how stock assessments are presented, and creating a comprehensive list of vessels involved in tuna fishing and a list of all vessels involved in illegal or unregulated tuna fishing.⁵⁰ Since this first meeting several joint meetings have been held, as well as technical workshops.

While people working in the tuna organization secretariats privately acknowledge the problem of vessels moving from one fishery to another, there has been no real effort to tackle joint regulatory issues. Thus far the primary aspects of collaboration have involved the sharing of information about vessels fishing illegally (as well as vessels allowed to fish in each region) and general data sharing. The collaborative process runs a joint website that is a repository for some shared information, as well as performance reviews of the member organizations (using criteria agreed to as part of the Kobe process).⁵¹ More recently, though, the collaboration appears to have waned.

Basel, Rotterdam, and Stockholm Conventions – BRS

Perhaps the deepest collaboration among organizations with similar mandates comes from the adoption of a single secretariat by the Basel, Rotterdam, and Stockholm Conventions. All three of these conventions focus on hazards that move across international borders, frequently by trade. They began completely independently, with their own organizational

structures and their own secretariats. But their regulatory structures overlap in several ways. The Prior Informed Consent (PIC) procedure that is central to Basel and Rotterdam functions similarly. Rotterdam and Stockholm regulate some of the same substances – those that are both persistent organic pollutants (and thus regulated under Stockholm) and pesticides or chemicals that are traded (and thus regulated under Rotterdam). Because of these overlaps, the experts and state representatives participating in meetings were often the same across institutional processes, making the possibility of collaboration easier.

How to best work with these intersections was first discussed at the WSSD meeting in 2002 and taken up by the UNEP Governing Council shortly thereafter. Cooperation began tentatively but quickly accelerated. In 2005, the organizations asked their three secretariats to explicitly study the possible synergies among the three, and they developed an Ad Hoc Joint Working Group in 2006. By 2010, the three organizations had created an Omnibus Decision on how to work jointly on activities and managerial functions and review arrangements, as well as synchronizing budget cycles and conducting joint audits. The parties to all three conventions met simultaneously for the first time in 2010. By 2011, each of the COPs of the three conventions had decided to create a position of Executive Secretary who would jointly oversee the secretariats. Once that position was created and Jim Willis (from the United States) appointed to it, he worked on a proposal to create a single secretariat to serve all three conventions.⁵² This process was assisted by the adoption in 2014 by the newly constituted UN Environment Assembly (discussed further in Chapter 2) of a Special Programme on Chemicals and Waste. This program works to strengthen national institutions for implementing all of the UN-related treaties on chemicals and hazardous wastes.

The COPs of the organizations now run contiguous meetings that involve an initial joint meeting followed by meetings of the individual COPs that are both sequential and intermingled to allow issues to be carried across the COPs of the different organizations. Even apart from any other advantages, meeting jointly saves time and resources, especially since many of the same people would be involved across the separate meetings. The organizations also run individual websites, but they are under a common umbrella and format. This collaboration is impressive. Although individual decisions are taken, the membership across organizations does not perfectly map, and there are certainly some duplications of effort, the extent of coordination and joint action is unprecedented in the world of global environmental institutions.

Ozone Depletion and Climate Change

The overlap between institutions can be an issue not only when separate organizations address different aspects of the same issue, but also when

organizations address different issues that happen to intersect. One important instance of this intersection is the institutions that separately address ozone depletion and climate change. Initially there was a confluence of interests: because ozone-depleting substances are also greenhouse gases, the efforts under the Montreal Protocol to phase out the use of most ozone-depleting substances was good for the prevention of climate change. But because the institutions operated separately, with different mandates, the Montreal Protocol's priority was protecting the ozone layer. Some of the chemicals it advocated as substitutes for those that harmed the ozone layer were powerful greenhouse gases, contributing to climate change. The most notable of these are hydrofluorocarbons (HFCs), which eventually replaced the CFCs that had been used for air conditioning. The issue of the climate damage of these substitutes had been discussed for more than a decade at the Meetings of the Parties, and efforts were made to discourage their use when possible, but there was no legal requirement because it was not the focus of the agreement.

The ozone secretariat has led negotiations on an amendment to the Montreal Protocol, which entered into force in January 2019. The negotiations took more than seven years, with conflicts between developed and developing countries about the pace of the required phaseout.⁵³ The more noteworthy aspect, however, is that an organization charged with protecting the ozone layer would be willing to change its practices to meet an entirely unrelated goal.

Conclusion

International environmental problems are difficult to address internationally. Many environmental problems appear as externalities of other economically beneficial activities, undertaken by actors with power in domestic political processes. Though there are long-term advantages to preventing or mitigating environmental damage, there are also short-term costs to doing so, and there is often legitimate uncertainty about the causes or effects of environmental problems. Policymakers seeking reelection fear accepting certain costs in the present to accomplish uncertain gains that might appear long after their political careers end. States that benefit from environmental protection could benefit more from free-riding on the cooperation of others, and the fear that others may free ride (and thereby undermine successful international cooperation) may prevent states from creating strong international institutions.

It is thus not surprising that global environmental institutions are, for the most part, weak and underfinanced. Multiple institutions exist because states create those they feel will be most advantageous to their concerns and decision-making priorities. That some of these institutions have had the degree of success they had – in protecting some endangered species and

ecosystems, preventing ocean pollution, phasing out ozone-depleting substances and lessening acid deposition, and decreasing the transboundary movement of hazards – is a testament to their effectiveness. The continued creation of new institutions suggests that most accept the underlying model of intergovernmental cooperation to address global environmental harms.

The institutions addressed in this book have not solved global environmental problems. But they contribute to the ability of states to work together to make political commitments to change their environmentally harmful behavior. They accumulate and provide expertise to enable us to better understand and more effectively address environmental problems. They provide transparency to make it easier to ascertain whether states are meeting their obligations, and processes to assist or to punish those that are not. And although these institutions are contentiously negotiated and are the locus of political jockeying, they have helped, and will continue to help, mitigate global environmental problems. International cooperation is hard, and international cooperation to address environmental problems even more so. These imperfect institutions are nevertheless making a difference in protecting the global environment.

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High-Level Political Forum on Sustainable Development: <http://sustainabledevelopment.un.org/hlpf>

United Nations Environment Programme (UNEP): www.unep.org

UNEP Regional Seas Programme: www.unep.org/regionalseas/

Sustainable Development Goals: www.undp.org/content/undp/en/home/sdgooverview.html

Species and Biodiversity Institutions

CITES Secretariat: <http://cites.org/>

Convention on Migratory Species Secretariat: www.cms.int/

Ramsar (Wetlands) Secretariat: www.ramsar.org/

Secretariat for the Convention on Biological Diversity: www.cbd.int/secretariat/

The World Conservation Union (IUCN): www.iucn.org/

World Conservation Monitoring Centre: www.unep-wcmc.org/

World Heritage Convention Secretariat: whc.unesco.org/

International Ocean Institutions

International Maritime Organization: www.imo.org

International Seabed Authority: www.isa.org.jm/

International Tribunal for the Law of the Sea: www.itlos.org/

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Fisheries Commissions

CCAMLR: www.ccamlr.org/

CCSBT: www.ccsbt.org/

GFCM: www.fao.org/gfcm/en/

IATTC: www.iattc.org/
ICCAT: www.iccat.es/
IOTC: www.iotc.org
IWC: iwc.int/home
NAFO: www.nafo.int/
NASCO: www.nasco.int/
NPAFC: www.npafc.org/
NEAFC: www.neafc.org/
RECOFI: www.fao.org/fishery/rfb/recofi/en
SEAFO: www.seafo.org/
SPRFMO: www.sprfmo.int/
Tuna Org: www.tuna-org.org

Atmospheric Commons Institutions

Intergovernmental Panel on Climate Change: www.ipcc.ch/
LRTAP Secretariat: www.unece.org/env/lrtap/welcome.html
Multilateral Fund Secretariat: www.multilateralfund.org/
Ozone Secretariat: ozone.unep.org/
UN Framework Convention on Climate Change Secretariat: <http://newsroom.unfccc.int/>

Institutions Addressing Transboundary Movement of Hazards

Basel Convention Secretariat: www.basel.int/
BRS Secretariat (Basel, Rotterdam, and Stockholm, combined): www.brsmeas.org/
Minamata Convention on Mercury: www.mercuryconvention.org/
Rotterdam Convention Secretariat: www.pic.int/
Stockholm Convention Secretariat: www.pops.int/

Non-State Institutions

Global Reporting Initiative: www.globalreporting.org
ICLEI – Local Governments for Sustainability: www.iclei.org/
International POPs Elimination Network: www.ipen.org/
TRAFFIC Wildlife Trade Monitoring Network: www.traffic.org/
World Business Council for Sustainable Development: www.wbcsd.org/

Additional Institutions

Global Environment Facility: www.thegef.org/gef/

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