poaching units and increased penalties for abuses. At one time, these combined measures pointed to an estimated twofold increase in the African elephant population, but 2013 reports estimate a 50–67 percent decline in the number of elephants in some parts of East Africa (Levin 2014: A14).

International Environmental Institutions

The creation and subsequent strengthening of international environmental institutions have been a permanent legacy of the UN-sponsored conferences. These institutions play key roles in the process of global environmental governance, helping to set standards and participating in the negotiation of the treaties listed in Table 11.1. They monitor state behavior. They aid state members, NGOs, and other IGOs in the promotion of environmental standards. And occasionally these institutions enforce environmental law. Five institutions stand out, three of which were created specifically to address environmental problems and two of which, while originally tasked with development and trade, have been pressured to respond to environmental issues.

The United Nations Environment Programme. While many older IGOs had an environmental component to their responsibility (such as the WMO's monitoring of air pollution and the FAO's researching of environmental effects on water and fisheries), there was no agency or program devoted to environmental issues until the creation of UNEP after the 1972 Stockholm Conference. With Maurice Strong as its first executive director, UNEP championed the new environmental agenda and, with its headquarters in Nairobi, Kenya, became the first UN agency based in a developing country. Its mandate is to promote international cooperation in the field of the environment, serve as an early warning system to alert the international community to environmental dangers, provide guidance for the direction of environmental programs in the UN system, and review implementation of these programs. Its responsibilities are both "normative and catalytic" (Ivanova 2010: 33). Until 2013, its Governing Council set general policy and reported to the UN General Assembly through ECOSOC. For its relatively small size and budget (originally all raised through voluntary contributions), UNEP has a large agenda (DeSombre 2006: 14–20).

UNEP has four major responsibilities. First, it plays a key role in negotiating international environmental agreements and in providing the secretariat and oversight for treaty bodies. CITES, the Basel Convention on the Transboundary Movement of Hazardous Wastes, the Montreal Protocol Multilateral Fund, and the Convention on Migratory Species are among those covered. In some cases, it has been a catalyst for negotiations, as when UNEP executive director Mustafa Tolba provided leadership for the negotiation of the Montreal Protocol on Substances That Deplete the Ozone Layer in the 1980s, convening interested constituencies, applying pressure, and floating proposals.

Second, UNEP is charged with monitoring the international environment. For actual research, it commissions outside experts. Its Division of Early Warning Assessment coordinates information on water under the Global Environmental Monitoring System and on toxic substances under the International Registry of Potentially Toxic Chemicals. Often it works in close collaboration with other IGOs. To monitor atmospheric and ocean quality, UNEP works with the WMO and the International Oceanographic Council respectively. The monitoring and assessments enable UNEP to play an agenda-setting role on specific issues, as it has on chemical pollutants, hazardous wastes, and marine pollution.

Third, UNEP oversees the Regional Seas Program to protect thirteen regional seas. That responsibility was an expansion of UNEP's initial work in the Mediterranean Sea. Although that program is often seen as one of UNEP's major successes, the plans for various seas have faced critical problems, including contentious political relationships among participating states and lack of adequate funding. And fourth, UNEP manages the Dams and Development Program, a multistakeholder project, which is discussed later.

During its early years, UNEP was strengthened by the dynamic leadership of its first two executive directors, Maurice Strong and Mustapha Tolba. Yet it has always been handicapped by its limited leverage over UN specialized agencies and national governments, its location outside other UN centers, and the limited engagement of government stakeholders in its projects. Most limiting is its small budget (around $200 million), which reflects, in part, the dissatisfaction of major UN donors such as the United States, the United Kingdom, and Spain, which perceive that the UNEP bureaucracy has been captured by LDC interests.

Critics of UNEP's performance note its major shortcomings: its absence from the climate change debate; its inability to coordinate international environmental action or even provide for greater harmonization of reporting requirements for various conventions; and its inability to respond to the needs of states to enhance national environmental capacity. It is also important to note that UNEP was designed as a program, not a specialized UN agency; its leadership needs key negotiating skills, but its isolated location in Africa hampers that activity and makes it difficult to hire expert personnel (Ivanova 2010).

Partially in response to this critique as well as to the need to strengthen it as an organization, UNEP's Governing Council was upgraded to become the United Nations Environment Assembly in 2013. This was seen by then–UNEP executive director Achim Steiner as "a watershed moment." He added: "Universal membership establishes a new, fully-representative plat-

form to strengthen the environmental dimension of sustainable develo ment, and provides all governments with an equal voice on the decisio and action needed to support the global environment, and ensure a fai share of the world's resources for all" (UNEP 2012). Other reforms brou greater stability in finances, with a portion of the budget coming fr assessed contributions (earlier, all funding was from voluntary contrib tions), and more formal authority to aid states in capacity-building an implement environmental commitments (Ivanova 2013).

The Global Environmental Facility. Created in 1991, the GEF is the mo prominent international funder of environmental projects in low- an middle-income countries. Originally housed within the World Bank, in th mid-1990s it was restructured and became a separate institution. While th Bank continues to serve as a trustee of the funding facility and provide administration services, that separation enhanced the organization's legiti macy for the developing countries who are skeptical of the Bank's liberal economic orientation. UNEP provides scientific oversight and helps in selecting priorities, and the UNDP coordinates with other bilateral donors. NGOs are involved in the planning and execution of projects. The GEF has emerged as a useful complement to other sources of financial assistance for environmental projects in developing countries.

GEF funds cover the cost differential between a project initiated with environmental objectives and an alternative project undertaken without attention to global environmental concerns. Most importantly, its funds help leverage other funding for projects, so that by 2013 it had disbursed some $12.5 billion in grants, supplemented by $58 billion in cofinancing. In addi tion, through 16,000 small grants ($50,000–$250,000 each), the facility subsidizes grassroots groups, thereby building on its commitment to NGO participation.

GEF's priorities include financing the commitments under the UN Convention on Biological Diversity and UNFCC, with small grants for energy efficiency, renewable energy, emissions inventories, and adaptation projects, as well as commitments under the Stockholm Convention on Per sistent Organic Pollutants, the UN Convention to Combat Desertification, and the Minamata Convention on Mercury. Most ozone-related funding is handled through the Montreal Protocol Multilateral Fund, not the Global Environmental Facility.

The Global Environmental Facility's 183 member governments are rep resented in the facility's assembly; its council is composed of thirty-two states, with sixteen from developing countries, fourteen from developed countries, and two from the former Soviet bloc, and meets twice a year to approve work programs and projects. Decisions require double majorities of the funder and developing member states. Every three years, the affected parties review general policies and approve any changes to the GEF agree ment. Funds are replenished by the donors every four years and program matic initiatives have become more cohesive. NGOs enjoy an open invita tion to participate.

The GEF, like UNEP, fills a critical niche with almost 90 percent of its funding supporting climate change and biodiversity activities. Two main criticisms persist: not having its own social safeguards in place, relying instead on those of its implementing agencies, and not working closely enough with state-level and civil society actors to reflect local priorities. As is evident with all development partnerships, working relationships within the Global Environmental Facility need to be constantly renegotiated.

From Commission to High-Level Political Forum. The Commission on Sus tainable Development was created following the 1992 Rio Conference to monitor implementation of Agenda 21, give policy guidance on future ini tiatives, and promote partnerships for sustainable development. Located in New York, the commission served for twenty years as the venue for discus sion of issues related to sustainable development; whether it was more than just a "talk-shop," however, is debatable (Kaasa 2007: 112–116). It carried out its monitoring role by receiving reports from states, other UN bodies, and NGOs, but the content, formatting, and timing of states' reports was up to them, with no baselines and hence no way to assess progress or make cross-national comparisons. The commission did have some success relat ing to forests, oceans, and freshwater as well as in promoting multistake holder dialogues thanks in large part to the EU's priority on environmental issues (Kaasa 2007: 116–119).

The 2012 Rio Plus 20 Summit made the decision to replace the Com mission on Sustainable Development with the High-Level Political Forum on Sustainable Development, which convenes every four years at the heads-of-state level under UN General Assembly auspices and annually under ECOSOC. The hope is that the forum will prove more capable of meeting the challenges of sustainable development, given the role of high level officials in reviewing progress and suggesting an actionable agenda (Ivanova 2013). The intention is to make this new body a more equal match to the World Bank and WTO, which are far more powerful with respect to environmental issues.

The World Bank: A rocky road to becoming green. The World Bank is the largest multilateral donor for economic development and, as such, has been under the most pressure to make its economic development policies com patible with environmental sustainability. Yet its record has been a mixed one. In fact, it was during the 1960s and 1970s, when Bank funding focused on major infrastructure projects, that the emerging transnational environ-

mental advocacy networks targeted Bank development projects that hurt the environment. Such high-profile projects as Brazil's Amazon basin development project, Indonesia's population relocation from Java to neighboring islands, and dam projects in India came under intense scrutiny. Opposition to dam construction, for example, was led by the International Rivers Network, which beginning in the mid-1980s campaigned against China's Three Gorges Dam, Malaysia's Bakun Dam, and India's Sardar Sarovar-Narmada project, among others (Khagram 2000). The coalition claimed that such projects diverted rivers, accelerated deforestation, changed ecosystems, forced people to move to environmentally fragile areas, and had unanticipated negative effects on both the local population and the indigenous peoples. The same arguments were made about the Amazon basin projects, which brought the Bank adverse publicity for failing to provide environmental safeguards.

Susan Park (2010: 2) contends that the transnational environmental advocacy networks "*informed and helped shape* member states' decisions to implement new environmental standards." The Bank's response to this pressure came slowly. In the 1970s, environmental advisers were appointed, but their concerns were not integrated into the mainstream of Bank projects. By the end of the 1980s, Bank officials began to acknowledge environmental problems and work more closely with environmental NGOs. In 1993, again in response to NGO pressure, the World Bank established the independent Inspection Panel to investigate specific projects in response to citizens' claims of harm. Only in a few cases, such as Nepal's Arun III Dam, was the project subsequently canceled, however. Since 1993, lending for environmental programs has increased. Between 2004 and 2013, loans amounted to $31.8 billion, with most going to climate change projects, followed by water resource management and pollution projects. The number of staff addressing sustainable development and environmental issues has expanded. The Bank has published ten social and environmental safeguard policies, showing how it promotes inclusive and environmentally sustainable development and how its compliance procedures ensure that safeguard policies are followed in the sensitive areas of forestry, waterways, natural habitat, and dams. The Bank's annual *World Development Report* now includes considerable coverage of environmental issues in the context of sustainable development. Other Bank reports and meetings also reflect "green" language.

The depth of the Bank's commitment to environmental sustainability is still questioned, however. In 2008, the Bank's Independent Evaluation Group conducted its first systematic study of the environmental effects Bank projects, numbering 7,000 for the period 1990–2007. The report found that at each step of the lending process there was a lack of environmental focus and monitoring. The results may not be surprising, given that the environmental units of the Bank employ far fewer staff than do the administrative or economic divisions, and given that their staff have had a difficult time making the case for environmental policies solely based on economic analysis—the Bank's dominant culture. Whether environmental plans and concerns are actually integrated into projects depends too often on the interests of individual country directors (Weaver 2008: chap. 5). Another evaluation of 274 Bank environmental projects using the Bank's own evaluation process found that projects that addressed local priorities, namely water and sanitation projects, were more successful than those that addressed global issues such as climate change or protecting biodiversity, because the former were subject to greater accountability from local constituencies (Buntaine and Parks 2013: 77).

So as Catherine Weaver (2008: 21) asks, has the Bank become "green," or has it just been "greenwashed"? Although some practices have changed, the real question is whether the Bank has fundamentally altered its attitude toward development and whether new norms have been internalized. Weaver points to the "incongruence of sustainable development goals with the intellectual and operational cultures of the Bank" (24). One of the harshest critics of World Bank environmental policies argues that the Bank has actually hastened environmental destruction and that the Bank's culture may not be able to change (Rich 2013). Others disagree.

The same question is also relevant to the regional development banks, as they have followed the World Bank's lead and gradually adopted an environmental agenda, safeguards, and implementing mechanisms. Although adoption of an environmental agenda in these banks has generally lagged the World Bank's adoption, in some cases, such as that of the AfDB, environmental issues have gained urgency as the effects of climate change on the planet have become apparent. The AfDB serves as the implementing agency for the Global Environmental Facility in Africa, managing twenty-three projects across the continent, and more than half of these in 2013 alone. And "green growth" rhetoric is central to its 2013 strategy commitment to building resilience to climate shocks with infrastructure and natural resource protection.

The greening of trade: From GATT to the WTO. GATT was as reluctant as the World Bank and regional development banks to embrace environmental initiatives. In fact, when members of GATT were invited to work on the preparatory meeting for the 1972 Stockholm Conference, they feared that world market competitiveness would decline should anti-pollution standards be passed. GATT's Trade and Environment Working Group sought to avoid situations where pollution control systems would interfere with international trade. As Michel Damian and Jean-Christophe Graz (2001: 600) remind us, "The guiding principle at GATT was above all to prevent distor-

tions and hindrances to trade, and to keep the environment on the margins of trade."

Yet GATT and later its successor, the WTO, as well as other trade organizations, had to adjust to a new reality. Many of the multilateral environmental agreements listed in Table 11.1 include provisions that could restrict trade. The concept of sustainable development carries with it recognition that restrictions on trade may serve environmental objectives. Thus, GATT, the WTO, and other trade organizations have gradually been forced to address the tensions among trade, development, and environmental objectives and resulting legal disputes. The 1972 US Marine Mammal Protection Act, for example, prohibited the importation of Mexican tuna because tuna were caught with nets that entangled threatened (but not endangered) dolphins. In 1991, a GATT dispute panel ruled in favor of Mexico, declaring that environmental concerns over a foreign industry could not be used to bar imports. Despite protests from environmentalists, the decision was never formally approved by GATT's governing body and thus set no precedent. The United States and Mexico negotiated a bilateral settlement. GATT rules at the time required states to treat all like-products equally, without regard to process or how a product was made. Only gradually have environmental concerns been taken into account.

The 1994 agreement that established the WTO recognized the "objective of sustainable development, seeking both to protect and preserve the environment." Although that agreement incorporates GATT's Article XX, which requires states to treat all like-products as national equivalents, it also provides for protection of human, animal, and plant life or health, and for conservation of exhaustible natural resources. If those conditions arise, then countries can ban the products, so long as they do not protect only their own industries and do not unfairly discriminate. The WTO established its Committee on Trade and Environment under pressure from the European Union and the United States. Its responsibility has included clarifying the relationship between the multilateral environmental agreements and WTO rules, protecting market access for developing countries, and addressing the legality of eco-labeling to bring the practice under WTO rules. On the first issue, no specific provisions under multilateral environmental agreements have been challenged in the WTO, suggesting that such agreements may be the more effective way of addressing environmental problems. On the second issue, developing countries have been given more rights to participate in standard-setting, thus enabling them to protect their access to markets. On the third, the WTO has not mandated environmental labeling that gives full information to consumers. But the WTO has ruled that labeling requirements and practices should not discriminate, whether between trading partners (i.e., most-favored-nation treatment) or between domestically produced goods (national treatment).

If a dispute occurs over a trade action taken under an environmental agreement, then disputants should try to use the environmental agreement to settle the case. But the WTO will not ignore environmental issues and the organization's Dispute Settlement Body has made several decisions relating to environment/trade issues. In one 1998 case, for example, the panel upheld the US ban on imports of shrimp that were harvested in a way that harmed sea turtles, basing the decision on Article XX's general exceptions clause. Furthermore, the panel pushed the members to protect the sea turtles, resulting in the 2001 Memorandum of Understanding on the Conservation and Management of Marine Turtles and Their Habitats in the Indian Ocean. The WTO panel opened the door to an environmental justification for banning trade in a product when the purpose is to safeguard an endangered species, assuming that proper procedures are followed, including nondiscrimination (Weinstein and Charnovitz 2001: 151–152).

The WTO is far from a green institution. It still has no organizational commitment to environmental protection, nor has it accepted the precautionary principle as grounds for restricting trade as the EU has done. Instead, the WTO has given greater weight to scientific proof over the precautionary principle, and its legal decisions, while moving in the direction of accepting trade restrictions for the purposes of environmental protection, are very narrowly constructed. Many of the WTO's sessions are held behind closed doors, but it does permit *amicus curiae* briefs from citizens and NGOs, and over time more hearings have been held in public, adding transparency to its process.

One of the objectives of the WTO's Doha Round of trade negotiations has been to enhance the relationship between trade and the environment, including the reduction or elimination of tariff and nontariff barriers on environmental goods and services. But defining what is an environmental good or service has proved to be a stumbling block, and with the collapse of negotiations in 2008, as discussed in Chapter 8, the WTO's Trade and Environmental Committee has been relegated to maintaining contacts between the WTO Secretariat and the secretariats of the various multilateral environmental agreements.

Public-Private Partnerships and Environmental Governance

Just as private actors, businesses, and associations have played an increasingly important role in economic governance, private and other types of initiatives have expanded in the environmental arena. The Global Environmental Facility's Small Grants Program is one of the early public-private partnerships. The World Commission on Dams (WCD) provides a good illustration.

In 1998, the WCD was created as an independent international body composed of twelve commissioners representing affected peoples' groups, research institutes, hydropower companies, multilateral development banks, river basin authorities, and governments directly involved with construction of large hydroelectric dams. The commission's mandate was to conduct a review of the development effectiveness of 125 dams and establish social, economic, and environmental criteria for future construction. Although its recommendations were not legally binding, it provided a knowledge base for evaluation and a normative framework. The commission issued its report in 2000 and was disbanded in 2001, with its tasks being assumed by UNEP's Dams and Development Project and its campaigns folded into work by the World Conservation Union and World Wide Fund for Nature. The commission, however, provided an important model for public-private governance. It succeeded in shifting the focus toward a comprehensive view of water and energy needs and in establishing "'core values' of equity, efficiency, participatory decision making, sustainability, and accountability in all decisions related to dams and their alternatives" (Conca 2006: 198). The WCD has been called "the most innovative international institutional experiment" (Khagram 2000: 105). It clearly encouraged the formation of other partnerships, as over 4,000 public-private partnerships were registered with the UN Commission on Sustainable Development following the Johannesburg Summit of 2002.

Why have public-private partnerships been so critical in international environmental governance? Several factors account for this development: IGOs frequently adopt new programs without providing funds for implementation. As the idea of public-private partnerships has taken hold, they have provided a way of tapping other sources of funding and responding to pressure from NGOs. And as Liliana Andonova (2010: 31) notes, partnerships have provided a way "to engage nonstate actors in dialogue and co-governance on the basis of soft, experimental agreements, which at the same time can deflect pressure, co-opt critics, and increase the flow of information and expertise."

Public-private partnerships have been called a new form of global governance. They are not just replacing state authority with participation of NGOs and other representatives of global civil society. They are a form of hybridization, in which there is "retention of some traditional foundations of state authority" and also the growth of nonstate authority "grounded in a blend of expertise and moral claims" (Conca 2006: 211).

Private Governance and Rule-Setting

The Forest Stewardship Council (FSC) provides an excellent example of private environmental governance and rule-setting. Protection of endangered tropical forests has long been on the international agenda. Since the

1970s in UNCTAD and the 1980s with the International Tropical Timber Organization, resource management issues have included the goal of certifying that all tropical timber traded internationally comes from sustainably managed sources. Yet by the early 1990s it was clear that tropical deforestation had become a major problem. The rates of deforestation were doubling in the Amazon basin during the early 1990s, although by 2012 that had declined dramatically. Indonesia in 2014 achieved the dubious distinction of having the highest rate of deforestation in the world. That has led over the past two decades to massive fires and air pollution, threatening soil productivity and endangering species, in order to promote timber and palm oil exports. Economic downturns such as the 1998 Asian financial crisis create even more incentives to increase exports. Yet conflicting interests between producers of tropical timber (developing states, local communities, timber companies) and consumers (mainly in developed countries) who seek low prices have led to a deadlock, despite the goals of the 1992 Rio Conference.

The FSC was formed in 1993 by a group of 300 individuals brought together by the World Wide Fund for Nature (and its US affiliate, also the WWF) and Greenpeace and includes labor unions, indigenous peoples' groups, retailers, the consultancy sector, and the timber industry, as well as environmental NGOs. Based in Bonn, Germany, it is an independent voluntary arrangement designed to set environmentally sound, sustainable standards for the forest products industry. Its certification is intended to permit consumers to make environmentally informed purchasing decisions.

The FSC uses a combination of strategies to encourage compliance. It uses social pressure on retailers of timber products and on consumers to persuade them to refrain from buying wood from nonsustainable sources. It offers producers a certificate stating that sustainable forest management practices are being used (Dingwerth and Pattberg 2009: 712). To put this into operation, highly detailed technical information on both forest management practices and a "chain of custody" as wood moves from forest to consumer is required. Only wood receiving a certification carries the FSC logo. Major stakeholders meet in two chambers to discuss economic, environmental, and social issues and to monitor compliance. What is unique about this private governance arrangement is the provision of separate subchambers for representatives from the North and from the South, giving the South greater participation opportunities than found in most arrangements, even though groups from the North are better resourced (Dingwerth 2008: 617–619).

Several criteria and questions can be used to evaluate the FSC (Pattberg 2011: 269–271). Has certification aided in biodiversity conservation? Based on a study of almost 130 certification reports from twenty-one countries, positive biodiversity impacts have been noted in aquatic and riparian zones, high-value forests, and endangered species (Newsom and Hewitt 2005). Has

logging of certified forests resulted in preservation of endangered species? A case study from Malaysia found that to be true (Mannan et al. 2008). Have deforestation and wildfires been reduced? Research from Guatemala finds this to be the case (Hughell and Butterfield 2008). The FSC's own reports indicate that 180 million hectares have been FSC-certified in eighty-one countries. However, most of the land is in North and South America, while Africa and Southeast Asia lag far behind. Still, at least in early 2000, there was evidence that financial markets were paying more attention to these corporate practices, to the benefit of firms that became leaders, while punishing those that lagged behind (Conroy 2002: 215).

The FSC has also expanded the discussion of deforestation to include not only sustainability, but also tenure rights, indigenous peoples, and community rights. In short, the FSC is an innovative instrument of private voluntary regulation that has served as a model for alternative certification schemes, not only in the area of forestry but also in the sustainable management of fisheries.

Another private governance organization that sets standards and includes a monitoring and enforcement mechanism to evaluate whether firms are complying with their obligations is the International Organization for Standardization 14001 (Potoski and Elwakeil 2011). ISO 14001 was developed in the 1990s as an extension of the ISO (see Chapter 8), designed to provide participating industrial plants with an environmental management system for internal operations. The process for certification is extensive and costly (upward of $100,000), requiring specialized training and documentation. Not only does it help plants meet national environmental guidelines, but it also encourages members to take additional steps in the interests of environmental compliance. Independent external audits are conducted to ensure compliance. Judged by the number of participants, ISO 14001 has been successful, but nearly 80 percent of the adopters are in Europe or Asia, where the approach is widely used. Matthew Potoski and Elizabeth Elwakeil (2011: 298) explain these cross-national differences: "firms adopt ISO 14001 to signal their environmental activities in export markets and when their domestic markets have more experience with management-based standards," and firms are less likely to adopt "when their domestic regulatory environment is less flexible and more adversarial," as in North America and Latin America. The hope is to improve environmental conditions through voluntary actions of certified firms.

Global Environmental Governance in Action

The case of global warming discussed at the beginning of this chapter illustrates unique challenges for global governance. Contrasting efforts to address climate change with what is widely regarded as the successful case of reducing ozone depletion shows how global governance was achieved in the latter, while it has proved so difficult in the former. In both cases, the global commons are threatened.

Ozone Depletion: Anatomy of Success

Ozone depletion was thrust onto the international agenda in 1975, following a report submitted by two US scientists attributing depletion of the ozone layer to use of chlorofluorocarbons (CFCs), which are widely used in refrigeration systems. The correlation between use of CFCs and ozone depletion was a contested one among scientists for several years. But in a little less than a decade, following publication of new data confirming a widening ozone hole over Antarctica, most states and scientific experts acknowledged the scope of the problem. The United States and European states were both the major producers of CFCs and the major consumers, although usage in the newly industrializing countries such as India, China, Brazil, and Mexico was rising at about 10 percent annually.

The success of the international approach to governance of ozone can be attributed to several factors. Most important may have been the role of leadership on the issue from the United States, Canada, and Norway. The support of those countries rested on a mobilized public who articulated the issue and on supportive NGOs. In particular, the US government became active due to several catalytic events. Multilateral institutions were also critical, particularly UNEP, whose executive director, Mustafa Tolba, mobilized an international constituency and initiated consultations with key governments, private interest groups, and IGOs. He argued for flexibility, applied pressure, and floated his own proposals as a stimulus to participants (Benedick 1998). Scientists provided convincing data on the extent of the problem and on monitoring it, giving the process scientific validation. Multinational corporations that produced CFCs, including Dow Chemical and DupPont, found suitable substitutes at acceptable cost for most uses. Since only a small percentage of their business depended on this one product, they were able to accept a compromise with little effect on their profitability. The conditions proved ripe for a negotiated approach.

Furthermore, the negotiating process and procedures were handled expeditiously. The process was subdivided into smaller problems and the treaty was a flexible instrument that could be made stricter should the scientific evidence warrant change, or loosened, had the ozone hole problem been shown to be less severe. The parties agreed to compliance mechanisms that were independent of any formal dispute settlement procedures. An ad hoc working group of legal experts on noncompliance was established. It was to offer conciliatory measures to encourage full compliance in a cooperative, nonjudicial, and nonconfrontational way. Finally, the UNEP secretariat was at the center of the implementation process.

In the first phase, states promised to cooperate on research and data acquisition as agreed in the 1985 Vienna Convention. The second phase was the 1987 Montreal Protocol on Substances That Deplete the Ozone Layer, together with the 1990 London Agreement, which further tightened states' commitment to phase out ozone-depleting chemicals. While the negotiations were not easy, at the end of the process states agreed to permanent, quantitative emission limits on five CFCs for all countries, although some international trading in emission entitlements was permitted. The industrialized countries agreed to pay for the incremental costs of compliance for developing countries and the Global Environmental Facility offered financial assistance to help economies in transition—both key elements for reaching agreement.

The Ozone Secretariat, served by UNEP, is an example of a small secretariat with authority to oversee the various treaties and protocols, which along with a working group of the parties, a variety of expert panels, and a multilateral implementation fund forms the ozone regime (Bauer 2006: 34). The secretariat is the hub of a network of over a hundred national ozone units that provide services to developing countries' ministries, as well as draft initiatives for amendments and adjustments to the Montreal Protocol, in keeping with recommendations from the Technology and Economic Assessment Panel. Since passage of the Montreal Protocol, subsequent conferences have expanded regulations to include almost a hundred different ozone-depleting substances. A 2014 study identified several new ozone-depleting substances that are being evaluated by the secretariat's advisory panel. Over time, the Ozone Secretariat has acquired a solid reputation for its technical expertise, transparency, and strong diplomatic skills. It has found the "balance between being an active player behind the scenes and being perceived as a neutral and 'passive' tool from the viewpoint of governments" (Bauer 2006: 43–44).

Although the Global Environmental Facility was originally to serve as the principal source of funding for developing countries, in fact the Multilateral Fund for the Implementation of the Montreal Protocol has played that role in assisting developing countries in controlling ozone-depleting substances. The GEF has also provided financial assistance to Central and Eastern European countries. The Implementation Committee handles cases of noncompliance with the rules on consumption and production of controlled substances and provides both technical assistance to analyze the reasons for noncompliance and additional funding. Over $3 billion in funds were allocated for specific projects between 1991 and 2013.

Worldwide consumption of ozone-depleting substances has declined more than 75 percent since the Montreal Protocol came into force in the late 1980s, even while production has grown slightly in the developing world. In 2014, UNEP scientists concluded that Earth's ozone layer was

"well on the way to recovery" thanks to action against the ozone-depleting substances. Also, as noted in the climate change case study, they reported that the Montreal Protocol has made a large contribution to the reduction of greenhouse gases—which constitute some 90 percent of the emissions linked to ozone-depleting substances (UNEP 2014). Demand for products using CFC-like compounds continues to grow, however, as growing middle classes in China, India, and other developing countries demand refrigerators and air conditioners, but research for substitutes has been promising. States have instituted measures compatible with the regulatory provisions. In all likelihood, the global stratosphere has already experienced its highest levels of ozone depletion. But whether this will result in a permanent change in the ozone layer remains an open question. Outside of the polar regions, the ozone layer shows signs of recovery, while polar ozone loss remains large and variable. If current trends continue, scientists predict the recovery of the ozone layer by 2050.

Regional Environmental Governance

Many environmental issues require regional rather than global responses, and some issues, such as climate change, have seen strong regional initiatives. A number of regional IGOs, including the EU, NAFTA, and ASEAN, are involved with environmental issues, often responding to problems with differing approaches and degrees of institutionalization. There are also a large number of regional environmental agreements, as shown in Table 11.1, some with an entirely environmental emphasis, others linked to other issues. Most date from after the Stockholm Conference, where regional activities were highlighted and UNEP was charged with monitoring regional activities.

Yet *region* in environmental affairs may be defined by ecological systems such as the Mediterranean Sea or the Mekong River basin, or the transboundary flow of pollution such as the haze from forest fires in Indonesia. In other words, where regional institutional mechanisms have been created for environmental governance, they may be outside established regional IGOs. Generally, regional governance is founded on the subsidiarity principle: decisions are most effective when taken at the lowest possible level (Betsill 2007: 12–13). We look here at environmental governance in three regional organizations: the EU, NAFTA, and ASEAN.

The European Union

Among the regions, the EU has the strongest, most extensive, and most innovative environmental policies and has been a strong proponent of addressing climate change and global environmental governance. But it did not start out that way. There was no mention of the environment in the

European Community's original Treaty of Rome. It was not until the Single European Act of 1987 called for accelerated integration of a single economic market that the environment was mentioned for the first time. Balanced growth meant integrating environmental policies. Ten years later, in the Treaty of Amsterdam, signatories agreed that harmonizing environmental standards within the EU meant leveling the economic playing field and ensuring fair competition. Under the Lisbon Treaty, the EU committed itself to "sustainable development . . . based on . . . a high level of protection and improvement of the quality of the environment" (Article 2.3). That commitment also reflects strong public opinion in favor of environmental regulations, the emergence of green political parties in most EU member states, and the development of effective domestic environmental agencies at the national and local levels.

EU environmental principles are based on two key general principles: the notion that the polluter should pay to restore the environment, and the notion that preventive action should be taken when faced with an environmental threat. What differentiates the EU from other regional IGOs is the increasing reliance on the precautionary principle. The EU has also set environmental standards at all stages of the process, from production and distribution to consumption (eco-labeling), and has made access to information and transparency essential to a notion of justice in environmental matters.

EU environmental law now includes more than six environmental action programs and over 300 legislative acts with over 80 directives (Vogler 2011: 19) covering such issues as air, water, soil, waste disposal, genetically modified organisms (GMOs), biosafety, coastal-zone management, and hazardous chemicals. For example, in the area of air pollution, the EU has adopted increasingly strict directives on air pollution by vehicles, large plants, power stations, and aircraft, the phasing out of CFCs, prohibitions against various forms of noise pollution, and an energy tax on carbon dioxide emissions. On water pollution, the EU has common standards for surface and underground water, drinking water, and toxic substances. Environmental impact assessments have been mandatory since 1985 for all public and private projects above a certain size, and consultation with the public is required. As Henrik Selin (2007: 64) reports, not only is the environment "where national policy has been harmonized the furthest," but much "policy-making competence has been transferred from the national governments to the EU level." Indeed, the EU Commission has been the initiator, even though states themselves are the implementers.

Since the mid-1980s, the pace of community environmental legislation has slowed and the emphasis has changed with greater institutionalization. First, there has been a movement toward passage of directives over regulations. With directives, the EU sets out the framework with comprehensive long-term objectives, but it is left to the member states to decide the specific methods to be employed and to pass the appropriate legislation. For example, the EU passed the Integrated Pollution Prevention and Control Directive in 1996, a directive aimed at instituting permit requirements for large industrial users to take specific measures to minimize air, water, and land pollution. States themselves have discretion for establishing specific standards in keeping with technical requirements and local environmental circumstances. Similarly, in 1996, the EU passed the Ambient Air Quality and Auto Emissions Standards. Although the directive does not establish specific standards for all parameters, some are established for thirteen of the major pollutants, tightening standards for sulfur dioxide, nitrogen dioxide, and lead, among others. This approach to governance gives space for local and national variation, but establishes overall EU standards that help to level the economic playing field.

Second, the EU has taken steps to give consumers the power to make informed choices. In 1992, the Council of Ministers initiated rules for granting EU eco-labels for environmentally friendly products, enabling the consumer to choose those types of goods. Labeling of products from production to consumption phases is a prominent EU approach.

Third, in 1993 the European Environment Agency was established as an independent body to collect data that are comparable across member states so that appropriate policies are developed. That agency is weaker than anticipated, although one task has been to compile the EU's reports under the UN Framework Convention on Climate Change. The European Environmental Bureau has enabled NGOs to form active coalitions and gain access to all the EU institutions, though their relative impact varies by issue area and group. The major responsibility for environmental policy rests with the Commission's Directorate-General for the Environment, with detailed work falling to the Committee of Permanent Representatives. Their approach, and the probable explanation for the EU's comparative success, is to combine both management and enforcement strategies in order to achieve a binding common policy, utilizing allies in the scientific and NGO communities. The most controversial issues, like climate change, however, go to the heads of state in the European Council. It was the Council that announced the new EU climate change targets in 2014.

Fourth, several mechanisms have been developed to back up environmental policies with financing. These include the Financial Instrument for the Environment (LIFE), which aids states in complying with environmental guidelines and has financed over almost 4,000 projects, at a value of 3 billion euros, since its establishment. Funds from LIFE may jump-start a project. States may be given extra time to comply with EU rules and directives in order to improve domestic government capacity; national administrators from one jurisdiction may be sent to another to aid their government officials. The Commission monitors implementation and issues summary

reports on violations, although it may not make on-site inspections nor may it investigate direct violations. The Commission may interpret guidelines when uncertainty exists. "This twinning of cooperative and coercive instruments in a 'management-enforcement ladder' makes the EU exceedingly effective in combating detected violations, thereby reducing noncompliance to a temporal phenomenon" (Tallberg 2002: 610).

Finally, another key to the EU's success in pushing environmental regulation is the role of the European Court of Justice. More often than not, the court has upheld EU environmental law. In a 2007 case, for example, the ECJ imposed a temporary measure on Poland to suspend work on a highway that traversed an environmentally sensitive zone that had been protected by the EU's Directorate-General for the Environment in 2000. Eventually an alternate route was found.

As environmentally sensitive and technically advanced as the EU is in terms of environmental issues, political differences and implementation problems are still prevalent. Austria, Denmark, Germany, Finland, the Netherlands, and Sweden are very strong supporters of environmental protection. Having adopted higher national standards, these countries have pushed for stronger EU-wide regulations. The relatively less developed states such as Greece, Portugal, and Spain have more lax standards and have been laggards in meeting the framework directives. The EU's newer members from Eastern Europe are at a lower level of economic development and have weaker environmental regulations, but since they joined they have had to implement EU policies and approaches. The European Commission projected in 2001 that the 2004 enlargement process might prove to be "the biggest single contribution to global sustainable development that the EU can make" (European Commission 2001: 13). That has also proven to be the case for states that are current candidates for EU membership. They have to meet rigorous environmental requirements by the time of accession. Funds have been established to help this group of countries, which includes Albania, Iceland, Macedonia, Montenegro, Serbia, and Turkey, implement the EU standards.

Within the core EU states, it is clear that there has been a profound transformation. As the mayor of one Ruhr town in the late 1990s put it: "Twenty years ago, this city didn't have anybody who dealt with environmental issues. Today, we have a whole department and they get involved in everything—construction, industrial development, noise abatement. . . . But what has changed even more intensively is the attitudes of the people. They want something done for environmental protection, and they know environmental protection doesn't stop at the border" (quoted in Andrews 2001: A3).

But while the EU has become a strong advocate on environmental issues in other IGOs and has supported multilateral environmental treaties

across a range of issue areas, the European commitment has waned with regard to climate change, as discussed earlier.

The North American Free Trade Agreement

The 1995 North American Free Trade Agreement approached environmental protection from two different angles. First, NAFTA addressed sanitary and phytosanitary measures (animal and plant health). Each country is entitled to establish its own level of protection in these areas and prohibit the importation of products that do not meet these sanitary or health standards. Second, NAFTA developed an explicit linkage between trade and the environment. The debate over inclusion of this linkage pitted trade economists against environmentalists. The former argued that if Mexican prosperity resulted from the trade agreement, then environmental regulations would follow. There was little need to directly incorporate environmental provisions. Environmentalists, on the other hand, using the language of sustainable development, argued for enforcement of environmental laws and regulations.

In the final agreement, provisions to promote sustainable development as well as to strengthen and enforce environmental laws and regulations were included, making NAFTA more environmentally friendly than most other trade agreements or the WTO. Each party is able to maintain its own level of environmental protection and ban imports produced in violation of those standards. The conditions for such bans are carefully specified: there can be no discrimination between domestic and foreign suppliers, nor can they create unnecessary obstacles to trade. Only legitimate objectives can be served by environmental restrictions. And environmental measures cannot be "applied in an arbitrary or unjustifiable manner" or "constitute a disguised restriction on international trade or investment." When disputes arise over the application of the standard, the burden is to prove that it is contrary to NAFTA. Expert environmental advice is sought in such cases.

The North American Commission for Environmental Cooperation addresses regional issues. Unlike the EU approach, NAFTA does not set common standards, but encourages compliance with domestic law and facilitates capacity-building in member states. Thus the commission has addressed several environmental issues, including chemicals management, freshwater conservation, maize and biodiversity, and climate change in a limited way. An example of capacity-building is the commission's development of an online training course for customs officials and border inspectors on the illegal trade in ozone-depleting substances. More generally, it issues periodic overviews of environmental conditions in NAFTA's three countries—Canada, Mexico, and the United States.

Although NAFTA is the first international trade agreement to incorporate strong environmental actions and provide for NGO consultations,

MNCs are also guaranteed clear and transparent rules to protect investor rights. They have the right to sue host governments under NAFTA's Chapter 11, with the World Bank's International Centre for Settlement of Investment Disputes handling these claims. Chapter 11 is controversial, for several reasons. First, discussions are conducted in private. The decisions have been ambiguous, weighed down in jurisdictional and procedural issues, with no method for clarification. Second, Chapter 11 decisions have tended to support the interests of the MNCs against state environmental regulation, angering some states and the NGO community. For example, Mexico has lost at least five disputes under Chapter 11, with the government having to pay $200 million in penalties to corporations. Canada has also lost or settled the same number of Chapter 11 cases, awarding $157 million in compensation to foreign companies. Third, it is still unclear how the decisions can be enforced. But as one study asserts: "The 'chilling effect' that these rules put on governments is now undeniable. The mere threat of an investment lawsuit can be enough to discourage new public interest legislation that could interfere with a corporation's expected profits" (Perez-Rocha and Trew 2014).

While to a few observers NAFTA represents the greenest-ever trade agreement, others disagree. NAFTA has done little to curb the destructive activities of some companies and prevent the export of hazardous wastes to Mexico. Corporations are winning many disputes under Chapter 11, as mentioned, but often on narrow procedural grounds. Environmental issues along the US-Mexico border are not covered by NAFTA, but are handled through a binational commission that hears complaints yet has no enforcement powers. The increasing number of such environmental cases and the publicity suggest, however, that environmental protection is gaining support. Thus, agreement on issues like air and water quality is likely to be joined by greater agreement on climate change.

The Association of Southeast Asian Nations

Not all regions have successfully dealt with specific environmental governance issues. ASEAN provides an example of a regional IGO whose agenda has broadened to include environmental issues and that has increasingly incorporated NGOs into its activity. Yet its core norm of nonintervention and its members' diverse levels of development hamper its ability to respond. External actors including UNEP, the Asian Development Bank, and the UN Economic and Social Commission for Asia and the Pacific have helped to move the process forward.

ASEAN countries began cooperating on environmental policy in 1977; by 1989, annual meetings of governmental environmental specialists were being held; and in the 1990s, NGOs within the region, aided by US or European NGOs, developed regional networks and participated in consultations forged during the Rio Conference. Yet environmental cooperation has never been a priority, and the rhetoric of ASEAN's Strategic Plan of Action on the Environment of the 1990s was not matched with actions. Economic growth remained the main concern and the Asian financial crisis in the late 1990s prompted states to set aside environmental goals in favor of economic recovery. ASEAN's preference for weak institutionalism, nonbinding agreements, reliance on national institutions, and noninterference in the affairs of other states also impeded regional action (Elliott 2011). Additionally, states in the region have lacked the capacity for monitoring and implementation and are hindered by poor coordination between jurisdictions (both interstate and intrastate).

Over time, ASEAN's environmental concerns have become more urgent, including calls for greater institutionalization, better harmonization of goals, and better operational and technical cooperation. What is called the "haze problem" provided a key impetus to action.

The haze problem in Southeast Asia, caused by deforestation and land practices in Indonesia, has been a persistent problem since the mid-1980s. It is estimated that nearly 60 percent of the country's forests have been burned or logged. This includes land cleared by small-scale subsistence farmers and by commercial plantations, notably for palm oil used for biofuel, as well as logging for pulp and paper production. Because the majority of the activity is illegal, estimates of the scale of the problem vary widely, but it is generally agreed that the rate of loss has at least doubled since 1990. In 2014, Indonesia achieved the dubious distinction of having the highest rate of deforestation in the world. The deforestation itself is a major problem and contributes to Indonesia being among the top contributors to greenhouse-gas emissions. The problem first reached extreme levels in 1997–1998, when thick toxic haze from burning forests affected Singapore and Malaysia as well as Indonesia, making it a regional problem. It has grown in recent years, with 2013 being judged the most extreme to date.

In addition to the haze, the excessive grazing, overuse of chemical fertilizers, and urban pollution are making the region one of the most environmentally fragile in the world. Local NGOs challenged government policy by publicizing abuses and instituting legal action against the government of Indonesia. They enlisted the support of international NGOs such as the World Wide Fund for Nature, which was already involved in Indonesia's national parks and biodiversity initiatives. These activities challenged the ASEAN norm of nonintervention and put NGOs at center stage.

In 2003, ASEAN concluded the Agreement on Transboundary Haze Pollution—its first regional environmental agreement. It included new laws with penalties for noncompliance and a monitoring fund. Only in 2014, however, did Indonesia ratify the agreement—the last ASEAN member to

do so. Its lax enforcement of a 2011 moratorium on new licenses for logging has only fueled more illegal logging, indicating that effective enforcement of the regional agreement will be difficult.

Between 2003 and 2009, ASEAN set a number of ambitious environmental goals as part of the effort to create the ASEAN Community, discussed in Chapter 5. ASEAN's Vision 2020 calls for a "clean and Green ASEAN" and delineates a wide-ranging agenda, including specific projects in forestry, coastal environments, water management, and peatland management.

In 2007, ASEAN members issued the Singapore Declaration on Climate Change, Energy, and the Environment—a first step in developing a regional approach to climate change in recognition of the region's vulnerability to major weather events and coastal flooding. Developing a network approach on the related issues as well as partnerships with the private sector and the UN, ASEAN has laid out a position that includes cooperation for cleaner energy, an emphasis on adaptation and mitigation, and international agreements that are consistent with "common and differentiated responsibilities." There is still considerable skepticism, however, about whether and to what extent ASEAN and its members will support and sustain this commitment to addressing environmental issues (Elliott 2011). As discussed in Chapter 5, it has a history of being strong on rhetoric and weak on commitment.

Regional Environmental Agreements

Many environmental agreements are focused on a specific issue in a specific region. In several parts of the world, states have grappled with problems of river basin development and related environmental issues, including for the Nile River, affecting Egypt, Ethiopia, and Sudan; the Jordan River, shared by Israel, Jordan, Lebanon, and Syria; the Indus River, shared by Afghanistan, India, and Pakistan; the Mekong River, shared by Cambodia, China, Laos, Thailand, Vietnam, among others; and the Colorado River and Rio Grande, shared by the United States and Mexico. In many of these cases, countries have signed agreements for the allocation of available water supplies and for protecting water quality, but some have left out key participants. For example, the Mekong River Commission includes Cambodia, Laos, Thailand, and Vietnam, but the two upper–river basin countries—China and Myanmar—are only dialogue partners. In other cases, parties to agreements have refused to follow through with treaty obligations; and still others have not yet begun to address the extant environmental dimension.

Regional treaties have led to international litigation in several cases. A prominent one involves a dam project on the Danube River. The Gabcikovo-Nagymaros hydroelectric project was begun under a treaty signed by

Czechoslovakia and Hungary in 1977. Opposition by NGOs and actions by Slovakia (a successor state to Czechoslovakia) in the early 1990s resulted in a case before the ICJ in 1993, the first environmental case for the court. Hungary sued for environmental damage under the precautionary principle, while Slovakia cited Hungary for violations of the original treaty. The 1997 judgment held that both Hungary and Slovakia had breached their obligations under the treaty. The court argued that an integrated joint project had been constructed and that negotiations on the multiple issues needed to continue using current environmental standards, not 1977 standards, to protect water quality and nature (ICJ Contentious Case 1997). The decision was narrowly construed and the details were left to the parties to implement (Deets 2009).

Another case concerns the 1960 Indus Waters Treaty between India and Pakistan. The case arose from an Indian proposal to build a major hydroelectric project on a tributary river in the Indian-administered part of Jammu and Kashmir. Pakistan was concerned about the dam's effects on its water supply and requested the first-ever arbitration, as provided by the treaty. The Permanent Court of Arbitration, in The Hague, in its 2013 decision, recognized India's right to divert water for the project, but "tempered" its ruling by acknowledging Pakistan's right to a minimum flow of water (Permanent Court of Arbitration 2013). Most interesting from the perspective of environmental law, the court found that a state is obligated to take "environmental protection" into consideration when its activities may harm a bordering state. As in the ICJ case regarding the Gabcikovo-Nagymaros hydroelectric project, the Permanent Court of Arbitration applied current customary environmental principles (Kumar 2013).

The ICJ and other international courts have not generally addressed environmental issues, but as illustrated earlier this is changing. In 2008, Ecuador brought Colombia before the ICJ, claiming that Colombia's aerial spraying of toxic herbicides near their shared border was having adverse environmental and economic effects on its territory (ICJ Contentious Case 2008). Ecuador's case placed heavy weight on ecological arguments. In 2010, Australia brought suit against Japan in the ICJ, arguing that Japan was not complying with the 1986 moratorium on commercial whaling. In 2014, the ICJ ordered Japan to halt its whale hunt, concluding that it had breached its international obligations. Japan had argued it needed data to monitor the effects of overfishing on whale population and, hence, that its whaling was for scientific purposes, an argument the court rejected (ICJ Contentious Case 2014). The decision was celebrated by the environmental community and NGOs; Japan initially indicated it would comply, but announced in 2014 that it would resume its scientific whaling program.

* * *

Regimes, regime complexes, IGOs, agreements, public-private partnerships, and private governance arrangements at the global, regional, and local levels all contribute to global environmental governance, creating an increasingly dense network. As discussed in Chapter 1, however, it is essential to examine the extent to which states and nonstate actors implement and comply with environmental rules. It is also essential to utilize scientific research to ascertain whether these actions have been effective—whether they have contributed to reducing environmental degradation in its various manifestations.

The Challenges of Implementation, Compliance, and Effectiveness

There has been lively debate among academics and policymakers in the pages of journals such as *Global Environmental Politics* and *Global Governance* regarding the need for substantial restructuring of environmental governance institutions. On one side are those who argue for greater centralization in a global environmental organization. Lack of resources and poor coordination, some suggest, can be resolved by creating a World Environment Organization (see Biermann and Bauer 2005). Others argue that creating a new architecture will divert attention from the major institutional and policy issues. They can point to the urgency of the climate change issue, and the evidence that a multilevel, decentralized approach has emerged from both top-down initiatives of states and IGOs and bottom-up activities of epistemic communities, NGOs, and local governments. Peter Haas (2007), for example, sees "a broader decentralized network of environmental governance, where UNEP serves as a hub linking together spokes connecting to additional policy networks of scientists, NGOs, MNCs, IO secretariats, and state actors." He advocates strengthening UNEP's ability to receive and transmit information to a variety of recipients, with compliance left to development agencies. Ken Conca's hybridization concept (2006: 67–69) is a much more bottom-up approach, drawing upon a constructivist analysis of the water issue. In this view, governance emerges at numerous sites where values and rules are contested and where nonstate actors can take on substantive roles. Such bottom-up alternatives perhaps come closer to achieving democratic environmental governance.

Beyond the issue of institutional architecture, however, there are critical questions to be addressed. Have the parties (i.e., states) taken measures to implement existing international accords? Have the parties complied with the provisions of the accords? Especially for developing countries, failure to implement and comply is often a failure of state capacity, as in the case of Indonesia's lax enforcement of its moratorium on new logging licenses. Thus, enhancing state capacities can be a crucial requirement for environmental implementation and compliance. On some environmental issues, local, subnational, and private nongovernmental responses are required, and hence compliance and implementation depend on national enforcement capabilities.

More generally, are the various environmental arrangements effective? For a long time, states' compliance with and implementation of international agreements was used as the primary measure of effectiveness (Weiss and Jacobson 2000). As Oran Young (1999) has noted, however, effectiveness is a complex, multidimensional concept. Subsequent studies have demonstrated the need for both qualitative and quantitative analysis to determine changes in behavior by various actors, and determine effects on the environment itself, that can be linked to specific agreements or rules. Helmut Breitmeier, Arild Underdal, and Young (2011) compare the findings of two major multinational studies: the Oslo-Seattle project, with fourteen cases, and the International Regimes Database Project, with twenty-four cases. Although the studies are not exactly comparable, both come to the conclusion that environmental regimes do matter; their contributions vary by the nature of the problem and the character of the regime, but the regimes have a strong or a moderate causal effect in terms of programmatic activities and in improving data and reducing uncertainty. They found that some of the determinants of effectiveness included the distribution of power, the roles of "pushers and laggards," the influence of decision rules, and the degree of available knowledge of the problem. In terms of solving particular environmental problems, Hiroshi Ohta and Atsuchi Ishii (2014: 582) note, however, that there are "very few cases that clearly show any improvement of the environment except for the ozone regime and the international regulation of oil pollution of the sea." Undoubtedly, extensive further study will be required to answer the question of the effectiveness of environment governance in reducing environmental degradation.

The questions of effectiveness and how best to address particular issues apply across all global governance issues addressed in this book. We turn to them and issues of legitimacy, accountability, effectiveness, and leadership in the final chapter.

Suggested Further Reading

Benedick, Richard Elliot. (1998) *Ozone Diplomacy: New Directions in Safeguarding the Planet*. Enlarged ed. Cambridge: Harvard University Press.

Conca, Ken. (2006) *Governing Water: Contentious Transnational Politics and Global Institution Building*. Cambridge: MIT Press.

Elliott, Lorraine, and Shaun Breslin, eds. (2011). *Comparative Environmental Regionalism*. London: Routledge.