

North America's Environment

A Thirty-Year State of the Environment
and Policy Retrospective



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North America's Environment

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and Policy Retrospective*



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Foreword

It has been 30 years since the United Nations Conference on the Human Environment in Stockholm, when the world community was alerted to the unprecedented scale of environmental transformation effected by human activity and set on a course to protect and improve the human environment. UNEP's third Global Environment Outlook (GEO-3) examines environmental trends since the 1972 Stockholm conference and analyzes the social, economic, political and cultural drivers of change and the spectrum of policy measures adopted. GEO-3 is also published 10 years after the 1992 Earth Summit in Rio de Janeiro, when the world's nations committed themselves to a path towards sustainable development. In time for its successor, the 2002 World Summit on Sustainable Development in Johannesburg, GEO-3 sets an action-oriented environmental agenda for the future. This publication, a corollary to GEO-3, examines the state of North America's environment and provides a more detailed description

and analysis of its priority environmental issues and how the region addressed them during that time, as well as the critical and emerging trends it still faces.

It is encouraging to see the notable progress Canada and the United States have made in addressing a number of the most evident and serious environmental problems in the past 30 years. Improvements to North America's environment were made possible by the institution of environmental governance and environmental laws and policies at all levels, as well as the growth in cooperation between the two countries to protect shared resources and ecosystems. As this report shows, however, it is ever more apparent that although North America generally has and accords the necessary material and human resources to address local pollution problems and straightforward global ones, affluence stimulates consumption and energy use. Choices related to consumer lifestyles have limited the region's further advancement on the environmental front, particu-



larly in resource efficiency, waste reduction and the control of greenhouse gas emissions.

Although many environmental policies underscored in this report provide blueprints for other regions, with globalization there is the danger that inefficient and wasteful consumption patterns will also

spread. Unsustainable patterns of consumption and production in North America are a major cause of global environmental deterioration and there is an urgent need for the region, along with the other developed countries, to accept more responsibility for environmental change.

On the eve of the World Summit on Sustainable Development, it has become evident that protecting the environment and human security is a more challenging task than it may have seemed 30 years ago, or even 10 years ago. There is an ever more urgent need for us to recognize that human security depends on the abundance and health of environmental assets, goods and services. Significant changes will be needed – in decision-making at all levels and in day-to-day behavior by producers and consumers – for us to ensure their benefits are delivered in a sustainable and equitable way for current and future generations.

A handwritten signature in black ink, appearing to read 'Klaus Töpfer', with a long horizontal stroke extending to the right.

Klaus Töpfer

United Nations Under-Secretary General
and Executive Director, United Nations
Environment Programme

Preface

One of UNEP's fundamental mandates is to conduct accurate assessment and up-to-date reporting on the state of the world's environment. The Global Environment Outlook (GEO) biennial report series contributes to the fulfillment of this role. GEO-1, published in 1997, provided a regionally focused, qualitative appraisal of key environmental issues and trends and relevant socio-economic driving forces in all the world's regions. GEO-2, published in 2000 presented a coordinated and comprehensive State of the Environment (SOE) overview at regional and global levels. It analyzed how underlying pressures (such as social developments) affect the land, atmosphere, fresh and marine waters, biological resources, and forests, and provided a separate presentation of environmental policy.

This report, *North America's Environment: A Thirty-Year State of the Environment and Policy Retrospective*, expands on the North American regional contribution to the SOE chapter of GEO-3, published in May

2002. GEO-3 takes an integrated approach to SOE reporting and emphasizes the linkages between policy and the environment, past trends and possible future directions, and thematic areas. It also highlights the links among sectors (environmental, economic, social, cultural, etc). Its ultimate purpose is to connect environmental outcomes to activities, policies, and decisions. By providing a policy retrospective on progress made towards sustainable development since the 1972 Stockholm Conference on the Human Environment, GEO-3 will influence conclusions drawn at the World Summit on Sustainable Development in Johannesburg in 2002.

The SOE component of GEO-3, and of this more detailed appraisal of North America, assesses the environment over the past 30 years by documenting how it has changed and how that change has impacted key human and environmental systems in the region. The policy aspect of this analysis seeks to

explain how various policies have affected the environment in the past 30 years, to describe what is being done to lessen human impact on the environment and repair damage, and to evaluate the effectiveness of these policy measures.

Focus, Approach and Content

Focusing on UNEP's North American region, comprised of Canada and the United States, this report provides an integrated analysis of the state of resource assets and 30-year trends in nine major themes: atmosphere, biodiversity, coastal and marine areas, disasters, freshwater, forests, human health and the environment, land, and urban areas. Rather than offering a comprehensive description and analysis of the state of North America's environment in all its aspects, the report zeroes in on two priority issues for each of the nine themes. Following the approach taken in GEO-3, the specific issues identified under each theme build on those highlighted in GEO-2000 and include critical issues, emerging trends, hot spots, and once critical issues that illustrate successful policy responses. The thematic structure and discrete chapters belie the crosscutting nature of environmental issues; many of the topics overlap and are dependent upon and influence the character of the others. For this reason, attempts have been made at every opportunity to underscore the linkages between them. Because conclusions were drawn from the assessment of priority issues, they do

not reflect all issues related to the condition of North America's environment since 1972.

The basis of this analysis is the Pressure/State/Impact/Response (PSIR) framework. This reporting approach is a useful way of conceptualizing the cycle of changes in environmental conditions and exploring the linkages between humans and their environment. The PSIR approach seeks to provide information and data about:

- the natural and anthropogenic pressures on the environment, which range from drivers and agents of change such as socio-economic, political, and cultural conditions to direct indicators such as weather hazards, polluting emissions, and resource extraction;
- the state of resource assets and the condition of, and trends in, environmental media;
- the impacts of environmental change on ecosystems and functions, human health and well-being, and on the economy; and
- the responses by governments and civil society attempting to mitigate or redress environmental problems and their consequences.

Presented in an integrated narrative, this information shows how environmental issues have been addressed in Canada and the United States over the 30-year period in an iterative cycle of pressures, impacts, and responses. Boxes provide

definitions, highlight subregional issues, and serve to illustrate the text through examples. A series of boxes throughout the report also underscores the cooperative efforts by Canada and the United States to address transboundary issues and environmental problems of mutual concern.

Information and data are drawn from reliable published sources, such as the global datasets produced by the World Resources Institute (WRI), the Organization for Economic Cooperation and Development (OECD), and the Food and Agriculture Organization (FAO); national SOE reports and indicator bulletins, such as those produced by Environment Canada (EC), the US Environmental Protection Agency

(EPA), and other environmental and natural resource departments; analyses by authoritative non-governmental organizations such as the Worldwatch Institute; and some supplementary unpublished material, including academic literature. Despite the similarities between Canada and the United States regarding definitions, approaches, and time series used in environmental reporting, differences remain that in some instances have led to data reconciliation difficulties and data gaps. In addition, given the significantly larger population and economy of the United States, the issues highlighted in some themes tend to focus more on conditions there than in Canada.

Key Conclusions

There have been signs of progress.

Over the past 30 years, North America has had notable success with a number of environmental problems. It has:

- protected the ozone layer: non-essential CFC consumption was reduced to nearly zero by 1996;
- controlled emissions that cause acid rain: SO₂ emissions in the US declined 31 percent between 1981 and 2000, and 24 percent between 1991 and 2000;
- set aside parks and other protected areas: today, between 11 and 13 percent of the region's land area is protected;
- slowed wetland losses: between 1988 and 1993, over 850,000 ha of wetland and associated upland habitat were protected in Canada alone;
- stemmed emissions from point sources: aggregate emissions of six principal pollutants in the US have been cut 29 percent;
- reduced pollution in the Great Lakes: since 1972, there has

been an overall reduction of 71 percent in the use, generation, and release of seven priority toxic chemicals into the Great Lakes;

- stabilized desertification: expansion of plant cover on rangelands and other conservation approaches led to substantial reductions in wind and water erosion.

But improvements have slowed.

In many instances, gains made in arresting environmental pollution and degradation have recently been eroded by choices related to consumption increases and population growth:

- total energy use in North America grew by 31 percent between 1972 and 1997;
- progress in fuel efficiency has been offset by increases in the number of automobiles and the total number of kilometers traveled, and by a trend since 1984 toward heavier and less fuel-efficient passenger vehicles;

- a consumer lifestyle based on the desire for mobility, convenience, and product disposability has undercut the further advancement of resource efficiency and waste reduction.

North America's global impact is disproportionately large.

North America's success in improving local environments where people can live with clean water and air and enjoy green spaces has come at the expense of global natural resources and climate:

- with about 5 percent of the world's population, North America accounted for 25.8 percent of global emissions of carbon dioxide (CO₂) in 1998;
- per capita annual gasoline consumption for motor vehicles was nine times the world average;
- in 1997, the US transport sector accounted for more than one-third of total world transportation energy use; and
- by 1996, North America's ecological footprint was four times greater than the world average, its forest footprint 4.4 times larger. Its CO₂ footprint was almost five times the world average.

Effective reforms are possible.

We live with the decisions of the past. Today's decisions—and more importantly, our actions—will affect the future of our children and grandchildren for good or bad through their impact on our global environment. North America needs to accept more responsibility for environmental change:

- it needs substantial and concrete changes in its automobile use, more fuel-efficient technologies, and changes in municipal planning and urban development strategies that curb sprawl, including investment in public transport;
- people need to start connecting climate to individual behavior; and
- decision-makers need the political will to introduce improvements.

Executive Summary

Atmosphere

Over the past 30 years, North America has achieved notable gains in protecting stratospheric ozone and controlling emissions that cause acid rain. Both countries managed to shrink their non-essential chlorofluorocarbon (CFC) consumption to nearly zero by 1996. Regional levels of most

particulate matter (PM_{2.5}), and nitrogen oxide (NO_x) emissions. Ground-level ozone causes more than US \$500 million annually in agricultural and commercial forest yield losses in the United States alone. In 1997, some 47.9 million citizens lived in counties with O₃ above existing health standards. Scientific evidence that O₃ and PM_{2.5} can trigger or exacerbate respiratory illnesses prompted recent regulatory changes in health standards in both nations. They also stepped up cooperative efforts to address production and transboundary movement of O₃ and NO_x.

Climate Change and Passenger

Transport: With about 5 percent of the world's population, North America accounted for 25.8 percent of global emissions of carbon dioxide (CO₂) in 1998. Transport in Canada and the United States generates between 25 and 40 percent respectively of total North American CO₂ emissions. In the United States, emissions from the transportation sector increased

US Carbon Dioxide Emissions from Transportation, 1984–1998

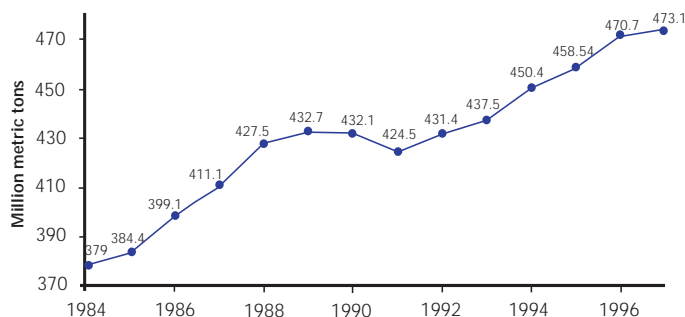


Figure 1
US Carbon Dioxide emissions from transportation, 1984-1998.

Source: EPA 2001b

traditional air pollutants were gradually pushed down as well, with especially dramatic declines in sulphate emissions.

Ground-level Ozone and Smog:

Relatively new concerns have arisen over ground-level ozone (O₃), fine

rapidly between 1984 and 1998 (see Figure 1). Automobile use is a significant factor in North America's greenhouse gas emissions and thus in its contribution to global climate change. Light-duty motor vehicles accounted for 15 and 17 percent of total CO₂ emissions in Canada and the United States respectively. Although average automobile fuel efficiency doubled between 1975 and 1989, progress has been offset by increases in the number of automobiles, the total number of kilometers traveled, and a trend since 1984 toward light-duty trucks and sport-utility vehicles (SUVs).

Biodiversity

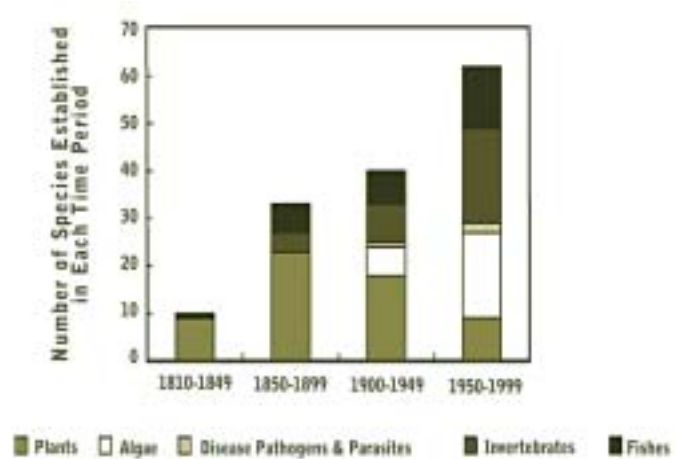
North America is home to many different types of ecoregions, and the United States contains a broader array than any other nation. About half of the two countries' most diverse ecoregions are now severely degraded.

Wetlands: Wetlands cover about 264 million hectares (ha), with about 24 percent of the world's wetland area lying in Canada. About a third of the region's threatened and endangered species depend on wetlands. Although wetlands continue to be destroyed by development, losses have slowed considerably since the 1980s, thanks in large part to bilateral cooperation in conserving wetland habitat for waterfowl: between 1986 and 1997, there was an 80 percent reduction in US wetland losses from the previous decade and between 1988

and 1993, 850,000 ha of Canada's wetlands were fully protected under the North American Waterfowl Management Plan.

Bioinvasion: In recent years, the introduction of exotic species has increased, imperiling nearly half of the US species listed as threatened or endangered. In Canada, alien

Number of Exotic Species Established in the Great Lakes



species have been involved in causing risk to about 25 percent of endangered species. In 1998, about a quarter of the annual US agricultural GNP was lost to damage from and control of invasive species. The influx of new species into the Great Lakes continues (see Figure 2) and is considered to be the most serious threat to the integrity of the ecosystem.

Coastal and Marine Areas

The region's fisheries have declined precipitously since the mid-1980s (see Figure 3). Twenty-one of the 43 groundfish stocks in Canada's North Atlantic are in decline and nearly one-third of US federally managed

Figure 2
Number of exotic species established in the Great Lakes.

Source: H. John Heinz III Center, 2001.

fishery species are overfished. Initially used to enhance natural stocks, aquaculture has become a large-scale industry; since 1980, US aquaculture has grown fourfold. However, aquaculture has its own environmental impacts.

Total Fish Catch, All Fishing Areas, 1972–1999

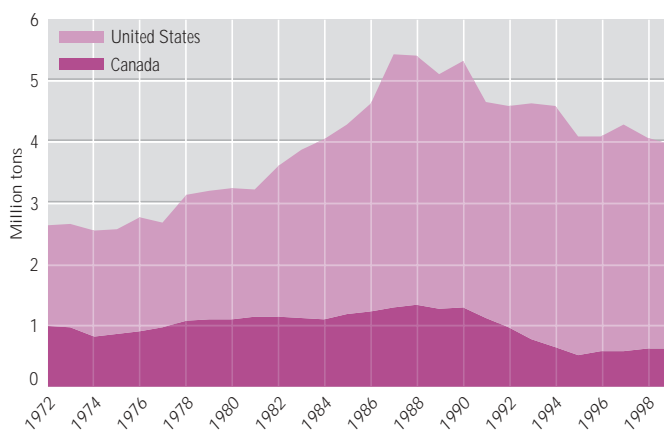


Figure 3
Total fish catch,
all fishing areas,
1972–1999.

Source: *Fishstat*
2001

Pacific Northwest Salmon Fishery: Historically abundant in many Pacific coastal and interior waters, salmon runs have been shrinking since the late 19th century. And despite restricted harvests and other measures during the 1980s, these declines have persisted. A total of 26 distinct groups are now listed by the United States as either threatened or endangered. Although there is a natural variability of abundance levels for Pacific salmon, uncertainty exists about the exact magnitude of recent declines. As fishing, climatic change, and habitat conditions have been changing simultaneously over recent decades, their relative importance has shifted as well. Harvest restrictions, recent bilateral cooperation, and new ecosystem approaches have helped to improve the ocean survival of some

important salmon stocks, but their future is uncertain.

Nutrient Loading: North America has had notable success in stemming nutrient emissions from point sources; today, it is non-point sources that give major cause for concern. Nutrient additions to marine and coastal ecosystems jumped dramatically over the past several decades due to large increases in population density, fossil fuel use, sewage inputs, animal production, and fertilizer use. Over the past 30 years, fertilizer use rose by almost 30 percent. Today, 65 percent of US coastal rivers and bays are moderately to severely degraded by nutrient pollution. Nutrients from human activity are likely a contributing factor in the recent dramatic increase in the number, intensity, frequency, and spatial extent of harmful algal blooms, which have caused harm to humans, fish, and marine birds and mammals, along with sectors of the economy that depend on healthy marine ecosystems.

Freshwater

Endowed with abundant water resources, North America holds about 13 percent of the world's renewable freshwater (excluding glaciers and ice caps). And North Americans use more water per person per year than any other people. Agriculture accounts for the largest proportion of total water consumed. While gross-point source water pollution has been successfully reduced in North America since the

1970s, non-point sources, such as agricultural runoff and urban storm drainage, have increased.

Groundwater: Contaminants from non-point sources are present in groundwater throughout large regions of North America, presenting risks to human health. Agriculture, with its widespread use of commercial fertilizer and unsustainable manure management, is the dominant factor impairing groundwater quality. Underground storage tanks and septic tank systems are also leading sources of groundwater contamination. In general, groundwater extraction slowed after the 1980s, but use of stored groundwater still accounted for about 10 percent of all freshwater withdrawal in the United States in the mid-1990s. Despite recent conservation measures and reductions in withdrawals since the 1980s, extraction exceeds the rate of renewal in the Ogallala Aquifer, which underlies one of the world's major agricultural regions in the midwestern Plains states.

The Great Lakes: The Great Lakes Basin contains the world's largest freshwater systems as well as North America's biggest urban-industrial complex. It has 18 percent of the world's fresh surface water and provides drinking water for 27 percent of Canadians and 11 percent of US citizens. By the early 1970s, a mix of industrial, agricultural, and municipal effluents had created serious pollution. The 1972 signing of the Great Lakes Water Quality Agreement (GLWQA) (see Box 1)

Box 1: Bilateral Cooperation: The Great Lakes Water Quality Agreement (GLWQA)

The 1972 Great Lakes Water Quality Agreement committed the two countries to controlling and cleaning up pollution in the Great Lakes from industrial and municipal wastewaters. Amendments required developing Remedial Action Plans (RAPs) to clean up 43 Areas of Concern and renewals and expansions to the Agreement have since introduced the ecosystem approach and measures to address persistent toxic chemicals, airborne pollutants, pollution from land based activities, and the problems of contaminated sediment and groundwater.

launched a concerted bilateral effort to restore the Basin's water quality. Since 1972, there has been an overall reduction of 71 percent in the use, generation, and release of seven priority toxic chemicals and a significant reduction in the number and magnitude of chemical spills. This success in addressing the serious problems in the Great Lakes offers a notable example of cooperation among nations and local users. Nevertheless, challenges remain in the form of impacts from urban and suburban growth, persistent toxic chemicals, atmospheric deposition of toxins such as Persistent Organic Pollutants (POPs), invasion by exotic species, and the threats associated with climate change.

Land

North America has about 11 percent of the world's agricultural croplands, and about 46 percent of all US land is under agricultural production. The region produces ample amounts of food, fiber, and

other products both for its own needs and for export around the world.

Land Degradation: Agricultural expansion, intensification, and industrialization have also contributed to land degradation. Government conservation programs (see Box 2) and conservation farming practices spurred a decline in soil erosion of about one-third in the United States between 1987 and 1997, while in Canada, the share of cultivated land at high-to-severe risk of wind erosion declined from 15 percent to 6 percent between 1981 and 1996. Desertification has

the past 30 years, the area treated with chemical pesticides has rapidly expanded, increasing in Canada, for example by 3.5 times between 1970 and 1995. Evidence of their damaging impacts on wildlife led to the banning in the 1970s of some Persistent Organic Pollutant (POP) pesticides and the significant decline in their concentrations in biota since the 1990s. But because they bioaccumulate, last so long and can travel great distances in air and water currents, POPs are still found in the environment and in food supplies where they pose significant health threats, especially to indigenous peoples in the north. Pesticide regulation became more stringent during the 1990s. The introduction of Integrated Pest Management (IPM) programs and new 'soft' pesticides (such as oils, soaps and plant extracts) were among the factors that led to a marked decline in insecticide use since the late 1970s. Yet problems remain with the characteristics of some new pesticides, the rise of pesticide resistance, the increased intensity of use in some regions over the last decade, and scientific uncertainties over genetically modified organisms.

Box 2: Conservation Programs

Both countries adopted strategies that took fragile lands out of agricultural production to protect them from erosion. In all, about 13 percent of US cropland was idled under federal programs between 1982 and 1997 compared to 11 percent of cropland between 1950 and 1970. About 555,000 ha of marginal prairie agricultural land was removed from annual cultivation under Canada's Permanent Cover Program.

generally been stabilized over the past 30 years with expansion of plant cover on rangelands and control of erosion and water logging.

Historically, government agricultural policy in North America focused on short-term economic and production goals, but since the 1990s, sustainability has become an important consideration.

Pesticides: North America leads the world in the manufacture and use of pesticides, accounting for 36 percent of their consumption. Over

Forests

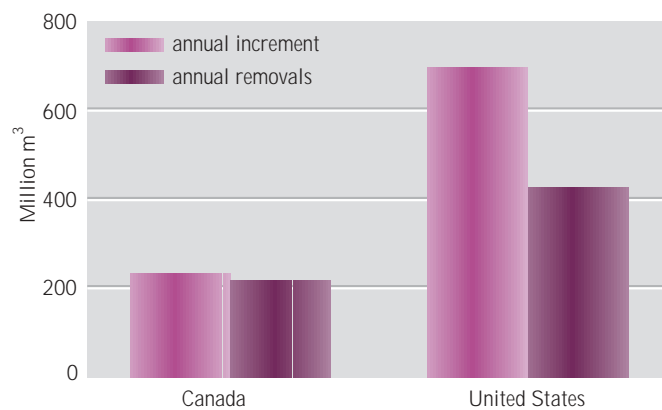
Forests cover about 26 percent of North America's land area and represent 12 percent of the world's forests. Canada has about 30 percent of the world's boreal forest, the largest North American forest ecosystem. Estimates for the late-1990s show that North America grows 255.5 million m³ more timber annually than is harvested (see Figure 4).

Forest Health: In some areas, forests are becoming increasingly fragmented, biologically impoverished, and weakened or stressed. Factors implicated in the trend include a significant warming trend and increased lightning, tree age, fire-fighting policy, harvesting, air pollution, and bioinvasions. As a result, many forest stands have become less resistant to catastrophic outbreaks of insects, diseases, and fires, which reduce habitat diversity and utilizable timber and add CO₂ to the atmosphere. For example, the area annually disturbed by fire and insects in the boreal forests of central and northwestern Canada doubled over the past 20 to 30 years compared to the previous 50-year period. Since 1992, policies have changed the definition of sustainable forestry from the promotion of a sustained yield of fiber to a new emphasis on maintaining wildlife habitat, protecting soils, retaining natural landscape characteristics and natural disturbances such as wildfires.

Old-Growth Forests in the Pacific Northwest: Most of the region's remaining old-growth forests lie in the Pacific Northwest, which probably contains about half the world's remaining un-logged coastal temperate rainforest. A growing worldwide demand for timber and higher prices in the 1970s drove the rapid harvesting of old growth, which provoked much-publicized debates focused on the spotted owl in the United States and on sensitive remaining rainforest areas such as Clayoquot Sound in Canada.

Pressure from nongovernmental organizations (NGOs) led to increased protection for old-growth forests. By about 2000, almost four million ha, or 15 percent, of British Columbia's (BC) old growth forests

Annual Timber Increment and Annual Removals on Available Forest Land



were fully protected. Over the past 30 years, the timber industry and the governments responsible for old-growth forests have gradually been influenced by the combined power of scientific knowledge of forest ecosystems, NGO action, public awareness, and market pressures. As a result, forest policies have changed to reflect broader concerns for biodiversity and more inclusive forest management.

Disasters

Although there have been no major environmental catastrophes such as the Exxon Valdez oil spill in the last few years, the incidence of smaller disasters has increased, threatening human and environmental health and safety. North America is also subject to a range of naturally occurring events which impact on human lives. A mix of factors,

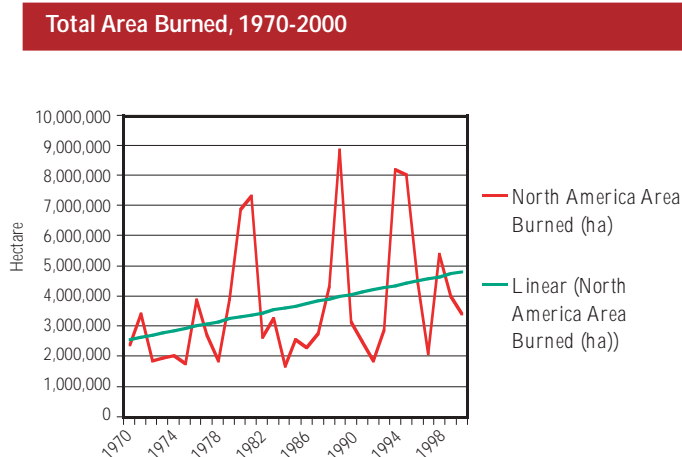
Figure 4
Annual timber increment and annual removals on available forest land, late 1990s
Source: UN-ECE and FAO 2000

including global climate change, population growth, urbanization, and affluence, have stepped up the frequency and severity of some types of natural hazards, such as floods, resulting in steep economic losses.

Floods and Climate Change: In the United States, the average amount of moisture in the atmosphere rose by 5 percent per decade between 1973 and 1993, mostly due to heavier precipitation events, which resulted in floods and storms. More people and their settlements have been exposed to floods because of population increase and concentration in flood-prone areas. Flood policies in both countries that focused primarily on building protective structures (levees, reservoirs, and floodways) were modified in recent years, representing a shift from a strategy of resisting natural hazards to one of building resilience into ecosystems and flood-prone communities. Climate change models forecast an increase in the magnitude, frequency, and cost of extreme hydrological events in some regions of North America.

Figure 5
Total area burned, 1970-2000.

Source: CCFM 2000, CIFFC n.d., NIFC 2000



Forest Fires: Forest fires are a natural part of North America's landscape and play an important role in maintaining and regenerating some types of forest ecosystems. Since the 1970s, the annual area burned by forest fires has expanded (see Figure 5), particularly in the western United States, due to a number of factors: fuel buildup from past effective fire protection programs; changed forest structure and make-up; changes in fire policy related to prescribed burning; and increased public access to and use of the forests. Higher temperatures and lower rainfall associated with climate change have also been implicated.

The challenge of managing wildfire in North America has been exacerbated in recent decades by population increases in the urban-wildland interface: the population growth rate in the US West now ranges from 2.5 to 13 percent per year, compared to the national annual average of about 1 percent.

Human Health and the Environment

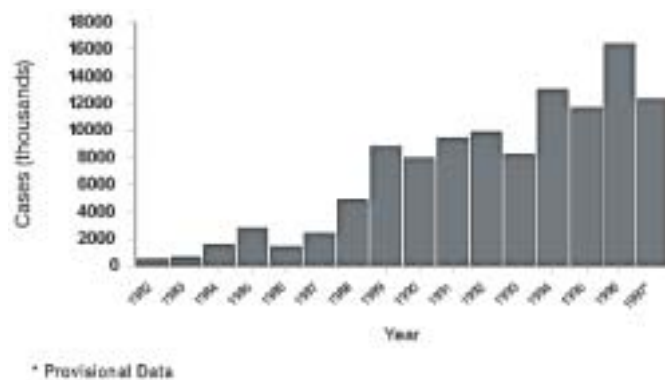
Early policy decisions in North America banned some very hazardous substances from the region, but success has not been sound. Today, knowledge of the more subtle human health effects of environmental pollution is beginning to come to light. For example, there is now evidence that more than 2 percent of all US deaths annually can be attributed to air pollution.

Children's Health and Environmental Contamination: Because of behavioral, physiological and development characteristics, children are more susceptible than adults to the harmful health effects of most pollutants. One in every 200 US children suffers developmental or neurological deficits as a result of exposure to known toxic substances. Air pollution, both outdoor and indoor, is among the most significant triggers for asthma symptoms. And childhood asthma is on the rise, affecting over 5.5 million children in North America and accounting for more than 60 percent of all their hospital visits. There is also mounting evidence that childhood and fetal exposure to trace amounts of pesticides creates adverse health effects. In recent years, recognition of children's environmental health issues has increased dramatically, and consequently some stricter regulations that consider their special vulnerabilities have been introduced.

Emergence/Resurgence of Vector-Borne Diseases: By 1972, public health policies and the effective use of pesticides had significantly reduced the threat of vector-borne infectious diseases. In the last 20 years, however, new vector-borne diseases have emerged and some old ones are resurging in the region. Climate change and human-induced land use change appear to disrupt predator-prey relationships, increasing the numbers of disease-carrying pests and human contact with them. For example, there is a relationship

between the expansion of suburbs and reforestation in the eastern United States, the abundance of deer and deer ticks, and a rise in the numbers of reported tick bites and infections of Lyme disease, a

Reported Cases of Lyme disease in the United States, 1982-1997



bacterial tick-borne infection and the leading vector-borne infectious illness in the United States (see Figure 6). A high degree of mobility and increasing trade have intensified the risk of exotic diseases being introduced into new areas. Warmer weather, too, may have contributed to the recent occurrence of West Nile Virus in North America and the resurgence of Hantavirus pulmonary syndrome in 1993.

Urban Areas

In the past 30 years, North America's urban population grew from 72 to 77.2 percent. North American urban populations consume high levels of energy and other resources and dispose of large amounts of waste. Canadian and US citizens are some of the highest per

Figure 6
Reported cases of Lyme Disease in the United States, 1982-1997.

Source: Gubler 1998a

North America's Environment

capita producers of solid municipal waste in the world, generating, respectively, an annual average of 630 and 720 kg per person in the mid-1990s.

Sprawl: By the 1970s, North America's postwar exodus from city centers had created a settlement pattern characterized by low-density suburbs surrounding city cores, commonly referred to as 'sprawl'.

problems with urban runoff, traffic congestion, air pollution and related human health impacts. Abetted by civil society groups, state and local governments and, more recently, national governments are increasingly developing 'smart growth' and sustainable city plans to address sprawl.

The Ecological Footprint: North America's urban and suburban pattern of growth is one of the principal forces driving the global increase in energy demand. North America's cities are major consumers of the world's natural resources and producers of its wastes. Wealthy cities and the wealthier groups within cities tend to appropriate from other regions more materials, food, and energy as well as waste assimilation capacity. In 1996, North America's total impact on the Earth's resources and ecosystem services, or its 'ecological footprint', was about four times larger than the world average (see Figure 7).

One of the most significant aspects of the disproportionate size of North America's ecological footprint is its large and growing energy use and related carbon dioxide (CO₂) emissions from fossil fuels. Total energy use rose by 31 percent between 1972 and 1997. An estimated 40 percent of total North American CO₂ emissions come from 50 metropolitan areas. In 1996, North America's CO₂ footprint was almost five times the world average.

Comparison of Ecological Footprints by World Region

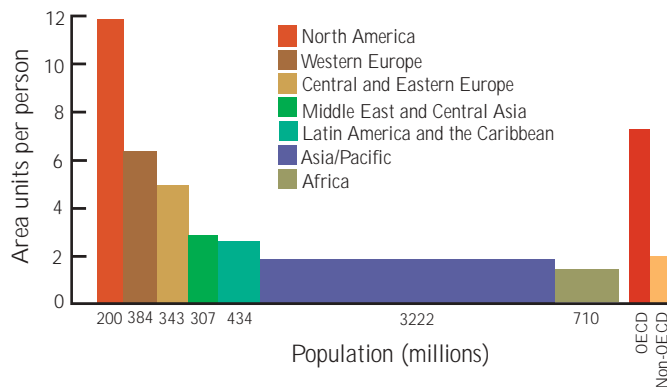


Figure 7
Comparison of ecological footprints by world region, 1996.

Source: WWF 2000

Although relatively more controlled in Canada, sprawl in North America was made possible by policies and incentives that encouraged dispersed settlement, leading to declining available public transit, increased car use, and longer commuting distances. Between 1981 and 1991, the number of car km traveled by Canadian and US citizens grew by 23 and 33.7 percent respectively, while the distances traveled by public transport declined. Sprawl has brought about the conversion of agricultural and wilderness lands to urban uses,