

fact sheet

Global Environment Outlook - 3

North America

North America comprises Canada and the United States.



GE O 3

PAST AND PRESENT: 1972 TO 2002

Land — Land degradation, associated with agricultural expansion, intensification and overgrazing of arid lands, combined with the widespread use of chemical pesticides, are major concerns in the region. Important socio-economic drivers include large federal subsidies, increasing global demand for agricultural products and increased trade liberalization.

In the United States (US), 30 per cent of croplands were highly prone to erosion in 1982. However, by 1992 this had fallen to 24 per cent.

A quarter of irrigated land had become affected by a build up of salts (salinization) by the mid-1980s and this situation continues to worsen in the heavily irrigated areas of the dry southwest of the US. In Canada, only 2 per cent of agricultural land is affected by salinization.

The US Conservation Reserve Program encourages farmers to retire environmentally sensitive cropland in order to reduce erosion and excess production. In Canada, the Permanent Cover Program aims to reduce soil deterioration on cropland by maintaining a permanent cover of grass and trees.

In Canada, the land area treated with chemical pesticides increased 3.5 times between 1970 and 1995. Pests are also becoming increasingly resistant to these chemicals. Some 500 insect pests, 270 weed species and 150 plant diseases are now resistant to one or more pesticides, according to one study.

In 1995, Canada established the Pest Management Regulatory Agency and, in the following year, the US passed the Food Quality Protection Act. Many local communities now restrict pesticide use on public lands and integrated pest management initiatives are gaining greater acceptance.

Freshwater — Groundwater, the source of water for 50 per cent of the region's population, is under increased threat from industrial and agricultural run-off. In 1998, more than 100 000 petroleum tanks in the US were found to be leaking.

Up to one-half of the US septic tank systems, the largest source of waste discharged to the land and a key suspect in the contamination of wells in rural areas, may be operating poorly. Nitrogen contamination is a chronic problem in the Canadian Prairies. In Canada, water withdrawal increased by 80 per cent during 1972-91 while the population grew by 3 per cent.

Nearly all US states have enacted groundwater protection legislation and similar national legislation has been initiated in Canada.

With 18 per cent of the world's fresh surface water, the Great Lakes Basin has been subject to a polluting soup of inadequate by treated sewage, fertilizer and wastewater effluent.

Under targets set by the US-Canada International Joint Commission, phosphorous loadings have been reduced by almost 80 per cent since the early 1970s. In 1997



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the Great Lakes Binational Strategy was launched to clean up sediment contamination and persistent organic pollutants, especially polychlorinated biphenols (PCBs).

Forests and Biodiversity — The region has 12 per cent of the world's forests, with Canada and the US ranked third and fourth, respectively, in total forest cover. In the US, forest area has risen by 1.7 per cent over the past decade. Some 255.5 million cubic metres more timber is now grown than is harvested in the region.

Long-term forest health is a concern due to increasing fragmentation, loss of biological diversity, modifications due to human intervention, poor harvesting practices, the introduction of alien species and acid rain impacts. Old growth forests have declined throughout the region due to land conversion to agriculture and increasing urbanization, especially in eastern areas.

In Canada, the National Forest Strategy was adopted in 1998 and, in 1999, the US Forest Service began to develop criteria and indicators for sustainable forest management. Over the past 20 years, large tracts of the region's forests have been set aside to maintain wildlife habitat, protect soil and retain natural landscapes. Forest product certification programmes are also expanding in the export market.

Habitat destruction and degradation is the most pervasive threat to wildlife in the region. Wetland protection and the threat posed by non-native species are priority issues.

In Canada, 352 species are considered at risk of imminent or eventual extinction, while in the US, more than 1 230 species are endangered or threatened. Outside of far northern areas, the region has lost one-half of its original wetlands, mainly due to agricultural expansion and population growth. To safeguard the region's biodiversity, more than 14 per cent of the land area now enjoys some protective status.

Losses have slowed considerably in recent years with changes in land-use policies and cooperative conservation efforts.

The North American Waterfowl Management Plan led to the improvement and restoration of more than 3.8 million hectares of wetlands in the 1990s. A 20-year, US\$7.8 billion, plan to restore the Florida Everglades has begun.

Invasive species have now put 25 per cent of Canada's endangered species at risk, 31 per cent of its threatened species and 16 per cent of the vulnerable species. Four per cent of freshwater species are at particular risk of extinction from aquatic invaders.

In response, both countries have enacted a mixture of legislative, industrial and scientific measures to control the bio-invasion. The influx of such species to the Great Lakes continues despite stringent shipping regulations.

Coastal and Marine areas — North American fisheries have been in severe decline since the late 1980s, with at least one-third of all species over-fished. The combined effects of fishing, climate change and habitat conditions have greatly impacted the Pacific Northwest salmon fishery.

The 1985 Pacific Salmon Treaty, and its subsequent amendments, have attempted to resolve many disputes. Both countries have initiated programmes to conserve and rebuild salmon stocks and significantly reduce harvest quotas to protect the species.

In 1998, more than 60 per cent of US coastal waters were moderately to severely degraded by nutrient contamination. Most municipal wastewater discharged into Canada's coastal waters is still untreated or only partially treated. The number of harmful algal blooms doubled between 1972 and 1995 in US coastal waters.

The US and Canada have developed extensive water quality testing programmes. The North American Commission for Environmental Cooperation has been facilitating the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities in the region.

Atmosphere - Over the past 30 years, there have been noticeable improvements in air quality, with dramatic declines in sulphur emissions under acid rain control programmes. New concerns have arisen over low-lying ozone which is formed from pollution in the presence of sunlight, and the health impacts of fine particulate matter.

Most of eastern Canada's low-lying ozone originates in the US, while Ontario is the source of oxide of nitrogen for the northeastern US. Oxides of nitrogen emissions, from sources such as cars and factories, in the US have increased by 17 per cent since 1970. Two per cent of all deaths in the US annually can be attributed to air pollution.

The two countries have agreed to a series of measures to address air pollution problems. The 1991 Air Quality Agreement, and its amendments, has targeted border emissions of NO_x from fossil fuel power sources. In 1999, a Protocol to Abate Acidification, Eutrophication and Ground-Level Ozone was signed. Health standards dealing with ozone and particulate matter have also been strengthened.

With about 5 per cent of the global population, North America emitted nearly 26 per cent of man-made carbon dioxide, the key main greenhouse gas, in 1998. The transport sector is the largest source of these emissions. In the US it accounted for 5 per cent of the global human-caused total. North America's average surface temperature has warmed by more than 0.6 degrees C since the late 1970s.

Internationally, both the US and Canada are parties to the UN Climate Change Convention but have yet to implement the treaty's Kyoto Protocol. The US announced in early 2001 that it would pursue domestic measures to address the issue. Canada has announced its intention to ratify the treaty once an intensive national debate among all stakeholders is concluded.

2032: CHOICES FOR THE FUTURE

We are at a crossroads with the future in our hands. The decisions taken today and tomorrow will define the kind of environment this and future generations will enjoy. GEO-3 in its Outlook chapter outlines four policy approaches leading to different outcomes over the next 30 years. Here we highlight two of the most contrasting scenarios: *Markets First* and *Sustainability First*. One envisions a future driven by market forces; the other by far-reaching changes in values and lifestyles, firm policies and cooperation between all sectors of society.

Land - Under *Markets First*, the area of built-up land approaches 3 per cent by 2032, up from about 2 per cent now, as a result of low urban densities and heavy reliance on the car as a mode of transport.

***Under Sustainability First*, the area of built-up land falls to below 2 per cent by 2032 as more compact settlements are developed and planners respond to life-style changes that are less car-dependent and favour greater proximity to home and work and centres of culture and leisure.**

Freshwater -The number of people living in severe water stress areas increases with population growth, although the overall percentage declines under a *Markets First* future. Widespread introduction of water pricing and the removal of agricultural subsidies leads to a reduction in water demand. However, water diversion schemes are explored as river basin water levels decline.

Regulatory efforts in *Sustainability First* lead to much more significant decreases in the percentage of the population and total numbers affected by water stress, falling from some 120 million to below 100 million. There is a shift to rain-fed crops, resulting in more efficient water and land use.

Forests and Biodiversity - With strong economic growth under the *Markets First* scenario, there is rapid expansion of plantations, built-up areas and agricultural lands, resulting in loss of biodiversity and disruption of habitats. Climate change also threatens natural vegetation. By 2032, close to 60 per cent of the land and its habitats and wildlife may be affected by the impacts of infrastructure, up from just

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under 40 per cent now. Mining, hydro power, and oil and gas development projects continue to make inroads into wilderness areas, particularly in Alaska, and northern Canada.

In the short-term, efforts to reduce sulphur dioxide cause a slightly greater climate change impact under *Sustainability First*. The area of land affected by the development of infrastructure rises to about 45 per cent, but this is far less than under *Markets First*.

Marine and Coastal areas — Pressure on marine resources is reduced by the expansion of aquaculture, under *Markets First*.

Land-based pollution is reduced under *Sustainability First* as a result of slower growth in infrastructure and significant changes in agricultural policies. Greater regional and international cooperation on fisheries contributes to the preservation and restoration of important fish stocks

Atmosphere — With North America on the outside of international efforts to tackle global warming, attempts to control greenhouse gas emissions do not succeed. Energy-related carbon dioxide emissions rise to well over 2 000 million tonnes by 2032.

The lifestyle changes that occur under a *Sustainability First* scenario, allied to technological advances, trigger a sharp fall in greenhouse gases. Energy-related emissions of carbon dioxide plummet to close to 1 000 million tonnes.

For more information please contact

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