


NATURAL VALUES:

Linking the Environment to the Economy

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THE ATMOSPHERE


Natural Values: Linking the Environment to the Economy was developed by Ducks Unlimited Canada (DUC) to improve the environmental and economic understanding of natural systems. In Canada, policy, legislation and regulation efforts must accelerate to protect our important resources. To view other installments in this series, visit www.ducks.ca/conserves/wetland_values/conserves.html



THE ATMOSPHERE PROVIDES US WITH CLEAN AIR TO BREATHE, protection from the sun's damaging rays, and a hospitable climate. In Canada, air pollution and greenhouse gases (GHGs) are compromising the atmosphere's ability to provide us with ecological goods and services. The consequences of atmospheric pollution are already being felt in Canada and include climate change, thinning of the ozone layer, reduced outdoor air quality, smog, and acid rain. Climate change is a particularly serious threat that has negative consequences for our climate, freshwater, fisheries, agriculture, forestry, coastal and northern communities and wildlife. These wide ranging effects impact our health, quality of life and economy.

Each year, air pollution causes the premature death of 16,000 Canadians. ¹

Environmental Values

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- A healthy atmosphere is necessary for proper **ecosystem functioning**. Biodiversity and the productivity of vegetation, including crops and forests, have been shown to decrease when outdoor air quality decreases. ²
 - Naturally occurring GHGs in the atmosphere provide us with a **layer of insulation surrounding the planet** that prevents the planet's heat from being lost to space. Human activities have increased the concentrations of GHGs in the atmosphere, enhancing the greenhouse effect and resulting in climate change or global warming. Canada's
 - GHG emissions increased by 24 per cent between 1990 and 2003. ³
 - The atmospheric ozone layer provides us with **protection from the sun's harmful UV rays**. Since the 1970s, the ozone layer over southern Canada has decreased by an average of 6 per cent. During spring, ozone thinning can be as high as 20 per cent for brief periods in southern Canada. ⁴
 - A healthy atmosphere provides us with **high quality outdoor air**. Increased levels of particulate matter and ground level ozone have reduced air quality in a number of Canada's urban centres.

Economic Values

When the quality of our atmosphere decreases there is a financial cost incurred to replace the lost ecological goods and services it provides, such as:

- 1 Increased illness and health care costs
- 2 Decreased revenue from agricultural production
- 3 Decreased revenue from forestry
- 4 Decreased revenue from fisheries
- 5 Decreased revenues from tourism activities associated with healthy ecosystems

Air pollution costs Canadians and the Canadian economy billions of dollars per year. The full social costs of air pollution, however, are even higher.

– Environment Canada, 2005²

Natural ecosystems – including wetlands, grasslands and forests – remove and store GHGs from the atmosphere.

The Value of the Atmosphere in Canada

The potential cost of climate change to Canadians has been estimated to be between \$3.5 billion and \$24.5 billion/year.¹

The health costs associated with the industrial air pollutants released in Canada's boreal region (using pollution levels from 2002) are estimated at \$9.9 billion/year.⁵

Acid rain has reduced levels of soil nutrients and tree growth in Atlantic Canada's forests, resulting in the loss of over half a million cubic metres of wood. The value of this lost wood is in the hundreds of millions of dollars.²

In Ontario, a reduction in seasonal ground-level ozone to 35 ppb or lower would improve agricultural productivity at an estimated value of between \$17 million and 70 million/year.¹

It is estimated that a single extreme visibility event would result in future tourist revenue losses in the Greater Vancouver Area and the Fraser Valley of \$7.45 million and \$1.32 million, respectively.⁶

DUC Recommends That:

- **Canadians** educate themselves on the importance of the atmosphere and the ecological goods and services it provides. Become active with a conservation organization.
- **Educators** recognize and incorporate the environmental and economic values of a healthy atmosphere into their science, social studies, geography and economics curricula.
- **Non-governmental organizations** fund and deliver programs that reduce Canada's levels of air pollution and GHG emissions.
- **Governments** fund atmospheric research and programming; develop policies and legislation to reduce Canada's levels of air pollution and GHG emissions; provide incentives for those who protect the atmosphere.

What's Next? Fact Sheet 5: Biodiversity

Important Links

- www.ducks.ca/conserve/wetland_values/conserve.html
- www.ducks.ca/aboutduc/news/archives/2004/041115.html

Endnotes

- 1 Chiotti, Q. and N. Urquiza. 1999. *The Relative Magnitude of the Impacts and Effects of GHG – Related Emissions Reductions*. Published by Environment Canada. Accessed January 2006 at: http://www.msc-smc.ec.gc.ca/saib/atmosphere/docs/co_benefits_e.pdf
- 2 Environment Canada. 2005. *Clean Air Online*. Accessed January 2006 at: http://www.ec.gc.ca/cleanair-airpur/Home-WS8C3F7D55-1_En.htm
- 3 Environment Canada. 2005. *Canada's Greenhouse Gas Inventory, 1990-2003*. Accessed January 2006 at: http://www.ec.gc.ca/pdb/ghg/inventory_report/2003_report/toc_e.cfm
- 4 Environment Canada. 2002. *The Ozone Layer*. Accessed January 2006 at: http://www.msc-smc.ec.gc.ca/cd/factsheets/ozone/page2_e.cfm
- 5 Anielski, M. and S. Wilson. 2005. *Counting Canada's Natural Capital: Assessing the Real Value of Canada's Boreal Ecosystems*. Published by the Canadian Boreal Initiative and The Pembina Institute. 78 pp.
- 6 Environment Canada. 2002. *The Clean Air Picture*. Accessed January 2006 at: http://www.pyr.ec.gc.ca/EN/Air/air_clean.shtml



Ducks Unlimited Canada
CANADA'S CONSERVATION COMPANY