

Wetlands and Forests

Abstract

Wetlands are areas characterized by relatively shallow water. These areas play an extremely important role in Canada's ecology. Canada has one of the largest areas in the world with wetlands covering more than 1.2 million square kilometres. They occur across most of the country, and their location usually depends on local factors, which include drainage, topography and surface materials.

Wetlands are lands that are nearly always wet. These lands filter the water that passes through them removing sediment and contaminants. They help recharge groundwater supplies and hold a large proportion of near-surface carbon. Wetlands also provide habitat for a great variety of species, particularly waterfowl.

Distribution of Wetlands in Canada

Canada has one of the largest areas in the world that are covered by wetlands reflecting about 25% of the world's wetlands. In Canada there are more than 1.2 million square kilometres of wetlands (127 million hectares) or 14% of Canada's total land area. The distribution of wetlands varies greatly across Canada.

Wetlands occur across most of Canada and their location usually depends on local factors, such as drainage, topography and surface materials. At a national scale, the distribution of wetlands is best explained on the map by including a thematic map layer showing geological provinces. It shows that wetlands are commonly found in the platform (flat-lying areas) particularly in the Interior Platform areas just south and west of the Canadian Shield's southern border, and in the Hudson Bay Lowlands lying to the south of the Hudson and James Bays. Most parts of the Shield have wetlands, but these are scattered and result from localized factors of terrain and soils.

The types of wetlands across Canada are described in more detail in the table below.

Table 1. Features of Wetlands in the Wetland Regions of Canada

Region	Main Features
Arctic	Five percent of the land area is covered by wetlands.
	This region contains 20% of all Canada's wetlands.
Subarctic	Permafrost plays an important role in wetland development by prohibiting internal drainage and concentrating available water at the surface.
	Thirty percent of the region is covered by wetland habitats.
	The interaction of excess water, severe climate, and discontinuous permafrost produce distinctive wetland forms.

	<p>Part of this region, the Hudson Bay Lowlands, covers an area larger than Great Britain.</p> <p>Salt <u>marshes</u> constitute 85 to 90% of the Hudson Bay Lowland</p> <p>On average, 20% of the land in the Boreal wetland region is covered by wetlands.</p> <p><u>Bogs</u> and <u>fens</u> are common.</p> <p>Coniferous and hardwood swamps are prevalent in the southern part of this region.</p>
Boreal	<p>Delta marshes are common around large lakes and rivers, notably the Slave River delta (which is found in Great Slave Lake), and the Peace-Athabasca delta (located just west of Lake Athabasca).</p> <p>There are over 100 000 beaver ponds in the Boreal Region, covering 5 to 10% of its total area.</p>
Prairie	<p>Five to twenty-five percent of the Prairie Region is wetland.</p> <p>Common wetland forms in this area include freshwater marshes, shallow open waters and saline marshes and individual pothole marshes.</p> <p>Half of the migratory birds on the continent pass through this region and use its wetlands.</p>
Temperate	<p>Five to fifteen percent of this region is covered by wetlands.</p> <p>Common wetland forms are hardwood tree swamps, extensive freshwater marshes, and saline marshes.</p> <p>Ninety to ninety-five percent of wetlands along the Lakes Erie and Ontario shores have been destroyed to enable urban development and agricultural production.</p>
Oceanic	<p>Wetlands cover less than 5% of the Pacific part of this region, but there is a variety of wetland types, including coastal marshes, forested swamps, and fens.</p>
Mountain	<p>Wetlands in the Atlantic part of this region are generally small. These wetlands feature coastal salt marshes behind barrier beaches and in protected bays, as well as bogs, fens, and forested swamps.</p> <p>Note that this region is in two widely-separated parts: most is in the Western Cordillera, but a small part is in the Torngat Mountains of eastern Canada.</p> <p>Common types of wetlands in both parts are floodplain marshes, potholes and shallow basin marshes in valley bottoms. The estuarine wetlands in the Fraser River Delta support the highest densities of over-wintering waterfowl, shorebirds, and birds of prey anywhere in Canada.</p>

Source: P.D.N. Hebert. Canada's Aquatic Environments. Habitats - Wetlands. Guelph, Ontario: University of Guelph, 2000.

Definitions of underlined terms

Bogs: These are peatlands covered with mosses (mainly sphagnum) whose colours range from pale green to red. Bog cover also includes low shrubs, trees such as black spruce or tamarack, and other plants such as sundew, pitcher plants and cranberry plants.

Fens: Fens are peatlands whose dominant plants are sedges (tall grass-like plants) accompanied by grasses, brown mosses and flowers such as iris. A fen is fed by streams or by ground water. Fens are less acidic and generally richer in nutrients than bogs. The water table is usually at or above the surface of the peatland.

Marshes: Marshes are wetlands which are either permanently or periodically flooded by water. They are split into channels by stands of sedge (a tall grass-like plant), grasses, rushes and reeds. Other plants common in marshes are cattails, arrowheads and water lilies.

Map Sources

Forested Areas

All of Canada is classified into one of eight vegetation cover classes (for example, coniferous forest) using imagery with one kilometre resolution. Satellite imagery is from 1988-1991 period. Source: Canada-Vegetation Cover, Fifth Edition of the National Atlas of Canada. 1993.

Geological Provinces

This layer was taken from the CD-ROM: Geological Map of Canada - Map D1860A. This edition of the Geological Map of Canada is the latest produced by the Geological Survey of Canada. It shows the 18 different geological provinces in Canada and surrounding oceans, the main types of rocks and the era when they have been formed.

Relief

This map layer shows relief (land elevation in metres) in Canada relative to mean sea level by means of hypsometric tints (different colours for each elevation range). Elevation data were derived from the Relief map, published in the 5th edition of The National Atlas of Canada.

Wetland Regions

Shows the percentage of wetlands within polygons which are representative of wetland concentration. This layer has been developed by integration of data from several thematic specific sources. It was prepared for use by Environment Canada to provide first order measures of wetlands distribution and conservation. Data sets used: 1. The 1995 AVHRR land cover classification. 2. The old ecodistrict (circa 1985) database of Canada. 3. The Soil Landscapes of Canada. 4. The Peatlands of Canada. 5. Ducks Unlimited and other provincial agencies.

References

Canada. Natural Resources Canada. The State of Canada's Forests 2001-2002. Ottawa. http://www.nrcan.gc.ca/cfsredirects/404_e.html

Hebert, P.D.N. 2000. Canada's Aquatic Environments. Habitats - Wetlands. Guelph, Ontario: University of Guelph. <http://www.aquatic.uoguelph.ca/wetlands/chregion.htm>

McKenney, Dan and Kathy Campbell. 2002. Getting into the Zone - What does Canada's new plant hardiness zones map really mean? Frontline, Forestry Research Applications, Technical notes no 103, Canadian Forest Service, Sault Ste. Marie. (Available in PDF only) <http://cfs.nrcan.gc.ca/forestresearch/subjects/landscape>

McKenney, Dan et al. 2002. Going Beyond the Zones - some next steps to knowing what can grow where in Canada. Frontline, Forestry Research Applications, Technical Note no 104. Canadian Forest Service, Sault Ste. Marie. (Available in PDF only) <http://cfs.nrcan.gc.ca/forestresearch/subjects/landscape>

Related Web sites (1999 – 2009)

Federal Government

Agriculture and Agri-Food Canada. Canadian Soil Information System. The National Soil DataBase. Plant Hardiness Zones in Canada
<http://sis.agr.gc.ca/cansis/nsdb/climate/hardiness/intro.html>
The Plant Hardiness Zones map outlines the different zones in Canada where various types of trees, shrubs and flowers will most likely survive. It is based on the average climatic conditions of each area.

Agriculture and Agri-Food Canada. Canadian Soil Information System. The National Soil DataBase. Soil Landscapes of Canada.
<http://sis.agr.gc.ca/cansis/nsdb/slc/intro.html>
The Canadian Land Resource Network has created a series of GIS coverages that show the major characteristics of soil and land for the whole country. Soil Landscapes of Canada were compiled at a scale of 1:1 million, and information is organized according to a uniform national set of soil and landscape criteria based on permanent natural attributes.

Canadian Environmental Assessment Agency
<http://www.ceaa.gc.ca/>

The Canadian Environmental Assessment Agency is an independent federal body, accountable to Parliament through the Minister of the Environment. The Agency works to provide Canadians with high-quality environmental assessments that contribute to informed decision making, in support of sustainable development.

Environment Canada. Canadian Wildlife Service. Québec Region. Conservation Atlas of Wetlands in the St. Lawrence Valley.

http://www.qc.ec.gc.ca/faune/AtlasTerresHumides/html/terres_humides_plan_e.html

The main purpose of the Conservation Atlas of Wetlands is to develop a portrait of the wetlands of the St. Lawrence Valley using innovative mapping methods in order to favor bird conservation by helping land managers to make decisions about land use and bird habitat conservation.

Environment Canada. Freshwater Website. The Nature of Water. Wetlands

http://www.ec.gc.ca/water/en/nature/wetlan/e_wetlan.htm

Environment Canada. State of the Environment Infobase

<http://www.ec.gc.ca/soer-ree/>

The State of the Environment (SOE) Infobase was originally developed in 1996 as an interactive and convenient mechanism for presenting a number of environmental reporting products and tools, including The State of Canada's Environment 1996 and Canada's National Environmental Indicators Series 2003.

Environment Canada. State of the Environment Infobase. Ecozones of Canada

<http://www.ec.gc.ca/soer-ree/english/ecozones.cfm>

This site introduces Canada's ecozones and the general concepts of ecological classification.

Natural Resources Canada. Canada Centre for Remote Sensing. Research and Development. Applications. Forestry

http://www.ccrs.nrcan.gc.ca/ccrs/rd/apps/forest/forest_e.html

Incorporating satellite data, hyperspectral, and polarimetric data with GIS, scientists at CCRS are working collaboratively to monitor Canada's forests, including their health, biodiversity, growth and yield, rate of harvest and regeneration, fire management, blow-down, and the impact of insects and disease.

Natural Resources Canada. Canada Centre for Remote Sensing. Tour Canada from Space

http://www.ccrs.nrcan.gc.ca/ccrs/learn/tour/tour_e.html

Natural Resources Canada. Canadian Forest Service. Great Lakes Forestry Centre. Canada's Plant Hardiness Site

<http://planthardiness.gc.ca/index.pl?&lang=en>

Canada's plant hardiness map provides insights about what can grow where. It combines information about a variety of climatic conditions across the entire country to produce a single general map.

Natural Resources Canada. Canadian Forest Service. Laurentian Forestry Centre. The ECOLEAP Project

<http://cfs.nrcan.gc.ca/projects/171>

ECOLEAP is a multidisciplinary project which goal is to identify the effects of environmental factors (temperature, fertility, etc.) on physiological processes (photosynthesis, respiration, etc.) and to link those factors to forest productivity.

Natural Resources Canada. Canadian Forest Service. Pacific Forestry Centre.

Canada's Forests

http://www.pfc.cfs.nrcan.gc.ca/canforest/index_e.html

An Overview of Canada's Forests and Forest Industry.

Natural Resources Canada. Canadian Forest Service. Pacific Forestry Centre.

Canada's National Forest Inventory

http://www.pfc.cfs.nrcan.gc.ca/monitoring/inventory/index_e.html

This site presents authoritative national statements on the distribution and structure of Canada's forests.

Natural Resources Canada. Canadian Forest Service. The State of Canada's Forests

<http://canadaforests.nrcan.gc.ca/>

Provincial/Territorial Government

Government of Manitoba. State of the Environment Report for Manitoba, 1997. The Prairie Ecozone : Focus on Sustainable Development

http://www.gov.mb.ca/conservation/annual-report/soe-reports/soe97/soe97_2.html

Manitoba's prairie ecozone today is an ecosystem reconstructed by human activity. Fertile soils that once sustained vast, mixed grassland and tall-grass prairie now support a three-billion-dollar agriculture industry, one of Manitoba's most vital economic sectors.

Other

Canadian Wildlife Federation

<http://www.cwf-fcf.org/en/>

CWF is dedicated to fostering awareness and appreciation of our natural world.

University of Guelph. Canada's Aquatic Environments. Wetlands

<http://www.aquatic.uoguelph.ca/wetlands/wetlandframes.htm>

Canada's Aquatic Environments was produced by the CyberNatural Software Group at the University of Guelph.

International Government

The Ramsar Convention on Wetlands

http://www.ramsar.org/cda/ramsar/display/main/main.jsp?zn=ramsar&cp=1_4000_1___

The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.



Inter-agency

Canadian Council of Forest Ministers. National Forestry Database Program.
Compendium of Canadian Forestry Statistics

<http://nfdp.ccfm.org/>

The Compendium of Canadian Forestry Statistics is a selection of statistical data from the National Forestry Database (NFD) published annually. It presents detailed data for the period between 1990 and 2001 as well as key historical data gathered previously from other surveys.

