

Plant Hardiness Zones

Abstract

Nine zones indicate the areas where various trees, shrubs and flowers are most likely to survive. These zones are calculated based on average climatic conditions and altitude of each area. The harshest zone is 0 and the mildest is 8. Each major zone is divided into subzones a and b (for example 3a and 3b) where zone a is slightly harsher than zone b.

The Plant Hardiness Zones Map provides an indication of the locations suitable for growing of trees and shrubs based on their ability to survive. Gardeners are familiar with this type of information because they use it to determine which plants to grow.

Methodology

This map shows an index of suitability for growth of trees, shrubs and flowers. It is calculated for all the areas in the country, using an equation that integrates climatic data from the 1930 to 1990 period. The climatic data used to calculate the index are the minimum winter temperatures, the length of the frost-free period, summer rainfall, summer maximum temperatures, snow cover, January rainfall and the maximum wind speed. Elevation data were also taken into account because of its direct effect on temperature and precipitation. Data are derived from a 2 kilometre by 2 kilometre grid.

Interpretation of the Map

The map is divided into nine major zones: the harshest is 0 and the mildest is 8. Each major zone is divided into subzones a and b (for example 3a and 3b) where zone a is slightly harsher than zone b. These nine zones are associated with probabilities of plant survival in relation to the average climatic conditions. However, some variations can occur within a zone because of significant local factors such as a change in the topography, variations of snow cover, year-to-year weather variations, exceptional weather events and even gardening techniques which have a significant impact on plant survival in any particular location.

The information presented on this map only gives a general indication of plant hardiness and is accurate to plus or minus two zones. In fact, errors can occur in station data and estimates between stations. The weather also fluctuates from year to year and the local variations may not be reflected on the map.

Map Sources

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McKenney, D.W., Hutchinson, M.F., Kesteven, J.L., Venier, L.A. 2001. Canada's plant hardiness zones revisited using modern climate interpolation techniques. *Can. J. Plant Sci.* 81: 129-143.

Ouellet, C.E., and Sherk, L.C. 1967a. Woody ornamental plant zonation I. Indices of winter hardiness. *Can. J. Plant Sci.* 47: 231-238.

Ouellet, C.E., and Sherk, L.C. 1967b. Woody ornamental plant zonation II. Suitability indices of localities. *Can. J. Plant Sci.* 47: 339-349.

Ouellet, C.E., and Sherk, L.C. 1967c. Woody ornamental plant zonation III. Suitability map of the probable winter survival of ornamental trees and shrubs. *Can. J. Plant Sci.* 47: 351-358.

References

Canada. Natural Resources Canada. The State of Canada's Forests 2001-2002. Ottawa.

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/subsite/ecoleap>

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://cfs.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/fr/index.html>

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.

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.

