

# Sustainable Forestry

ECOZONES OF CANADA



Courtesy NRCan

Canada boasts 10% of the global forested area, and 94% of its forests are publicly managed, one of the highest ratios in the world. From region to region, Canada's forests vary greatly. Canada features 15 eco-regions, nine of which are forested.

In addition to moderating the climate, preventing soil erosion, improving air and water quality, and providing habitat for countless species of plants and animals, Canada's forests sustain the economies of hundreds of communities. Forestry is Canada's largest industry, employing over 360,000 people in 2002 and generating exports of over \$44 billion in 2001. Most exports



Courtesy NRCan

were in the form of softwood lumber, wood pulp, and newsprint. The US is the primary market for Canadian forest products accounting for 81% of exports.<sup>1</sup>

The 1992 Earth Summit called upon all nations to ensure sustainable development, including the management of all types of forests. The summit produced a Statement of Forest Principles, conventions on biodiversity, climate change and desertification, and a plan of action for the 21<sup>st</sup> century called Agenda 21, all of which have implications for forest management. A seminar in Montreal, in 1993, focused specifically on criteria and indicators and how they can help define and measure progress towards sustainable development of forests (Montreal Process). In 1993, the **Canadian Council of Forest Ministers (CCFM)**, with the help of many scientific and technical advisors, consulted the industry and interest groups on sustainable forest management in order to come up with national criteria and indicators.

Criteria	1	2	3	4	5	6
	Conservation of biological diversity	Forest ecosystem condition and productivity	Conservation of soil and water	Global ecological cycles	Multiple benefits	Society's responsibilities
Elements	Ecosystem diversity	Disturbance and stress	Physical environmental factors	Global carbon budget	Productive capacity	Aboriginal and treaty rights
	Species diversity	Ecosystem resilience	Policy and protection factors	Forest land conversion	Competitiveness	Participation of Native communities
	Genetic diversity	Current biomass	-----	Carbon dioxide conservation	Contribution to the economy	Sustainability of forest communities
	-----	-----	-----	Policy	Non-timber values	Fair and effective decision-making
	-----	-----	-----	Hydrological cycles	-----	Informed decision-making

Courtesy NRCan

<sup>1</sup> Anon. 2000. The State of Canada's Forests - Forests in the New Millennium 1999-2000. Natural Resources Canada, Canadian Forest Service. Ottawa, ON

## Key players:

- The **Canadian Forest Service** is part of Natural Resources Canada and promotes the sustainable development of Canada's forests and competitiveness of the Canadian forest sector: <http://www.nrcan.gc.ca/cfs-scf>;
- **Parks Canada** are responsible for managing large bodies of water found in Canada's National Parks: <http://www.pc.gc.ca>;
- **Indian and Northern Affairs Canada** are responsible for managing large tracts of Northern Canada where much of Canada's boreal forest is found: <http://www.ainc-inac.gc.ca>;
- The **Canadian Council of Forest Ministers** is important forum for the federal, provincial and territorial governments responsible for forests to work cooperatively to address major areas of common interest. The Council provides leadership on national and international issues and sets direction for the stewardship and sustainable management of Canada's forests: [http://www.ccfm.org/about\\_e.html](http://www.ccfm.org/about_e.html);
- **Canadian Forestry Association:** <http://www.canadianforestry.com>; Founded in 1900, the CFA is Canada's oldest conservation organization. For over 100 years it has advocated the protection and wise use of Canada's forest, water and wildlife resources through public awareness and education programs. By promoting sustainable forest development, management and conservation, the CFA helps shape the future of Canada's forest and nurtures our economic and environmental health. To meet its objectives, the CFA:
  - provides a voice for provincial forestry agencies at the national level
  - participates in developing a national forest strategy
  - advises federal government on forest policy
  - organizes conferences, seminars and other exchanges on forest issues, a tradition since 1906
  - sponsors National Forest Week, and special events in cooperation with provincial forestry agencies
  - manages a program of Forest Capital of Canada celebrations
  - publishes the Canada's Forest Teaching Kit Series
  - gateway to the Canada Envirothon program on a national level in Canada
  - is home to Smokey Bear in Canada
  - coordinates the Logging for Wildlife workshop program
  - administers tree planting programs on behalf of corporate partners

### ***"Hot" Issues:***

- Biodiversity and forest ecosystems;
- Carbon accounting under the Kyoto protocol;
- Forest fires and how to best deal with them;
- Wildlife habitat protection and conservation;
- Sustainable forest management and forest productivity.

## Space and Sustainable Forestry:

Space based EO is a critical tool for managing forest resources, particularly for:

- land cover mapping;
- forest fire detection and assessment;
- carbon accounting (national accounts);
- tracking disease and infestations.

Multispectral visible band data is most often used for forestry in Canada, because it allows for vegetation discrimination even at coarser resolutions. In other areas of the world, frequent cloud cover pose a serious problem to the use of visible band data.

RADARSAT-1 C-band radar data is useful for terrain topography, and to some extent for vegetation classification. SAR data, particularly in L-band, is useful for biomass estimation, which in turn is important to issues such as climate change. Accurate forest height determination from space is also useful for estimating forest productivity, which is currently done empirically through representative site visits. RADARSAT-2 is expected to provide much better vegetation discrimination through its use of cross polarisation.



*AVHRR data showing forests burning in northern Manitoba, courtesy of Environment Canada*



*Forest map of Canada, with Landsat frame capturing Victoria and Vancouver, BC, Courtesy NRCan*

### Issues for the CSA:

- Level of support to forestry applications in relation to other areas;
- How to better demonstrate the cost-benefit merits of space data usage in Canada's largest industry;
- CSA has traditionally focused on SAR applications, while forest sector interest is in Landsat-type data.

**Related themes:**

Disasters  
Climate Change & Variability  
Environmental Factors Affecting Health  
Biodiversity and Ecosystem Conservation  
North/Arctic  
Cities and Urban Issues  
Sustainable Agriculture

**References:*****Basic Information***

An audio-visual “flash” presentation on Canada’s Forests from the Canadian Forest Service:  
[http://www.pfc.cfs.nrcan.gc.ca/canforest/flash/index\\_e.html](http://www.pfc.cfs.nrcan.gc.ca/canforest/flash/index_e.html)

***Latest Update***

From Forest Trends, a small, non-profit international NGO representing the forest industry, conservation interests, finance and others: <http://www.forest-trends.org/keytrends/>

***A closer look***

Report on State of Canada’s Forests: [http://www.nrcan.gc.ca/cfs-scf/national/what-quoi/sof/sof01/f2020\\_e.html](http://www.nrcan.gc.ca/cfs-scf/national/what-quoi/sof/sof01/f2020_e.html)

Montreal Process: [http://www.mpci.org/evolution\\_e.html](http://www.mpci.org/evolution_e.html)

Non Industrial Private Forest Management: a Cornell University Program on Forest Extension  
<http://www.dnr.cornell.edu/ext/forestrypage/index.htm>

Ecological Stratification Working Group. 1995. A national ecological framework for Canada. Agriculture and Agri-Food Canada, Research Branch, Centre for Land and Biological Resources Research and Environment Canada, State of the Environment Directorate, Ecozone Analysis Branch, Ottawa/Hull.

Lowe, J. J., Power, K., Marsan, M. W. 1996. Canada's Forest Inventory 1991: Summary by Terrestrial Ecozones and Ecoregions. Natural Resources Canada, Canadian Forest Service. Information Report BC-X-364E. Victoria, B.C.

Anon. 1997. The State of Canada's Forests - Learning from History 1996-1997. Natural Resources Canada, Canadian Forest Service. Ottawa, ON.

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Canadian Council of Forest Ministers. 2000. Compendium of Canadian Forestry Statistics - National Forestry Database. Ottawa, ON. Website: <http://nfdp.ccfm.org>

Statistics Canada Website [www.statcan.ca/start.html](http://www.statcan.ca/start.html)