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# Canadian Environmental Sustainability Indicators

## Sustainability of Timber Harvest



Canada 

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# Canadian Environmental Sustainability Indicators

# Sustainability of Timber Harvest

February 2016

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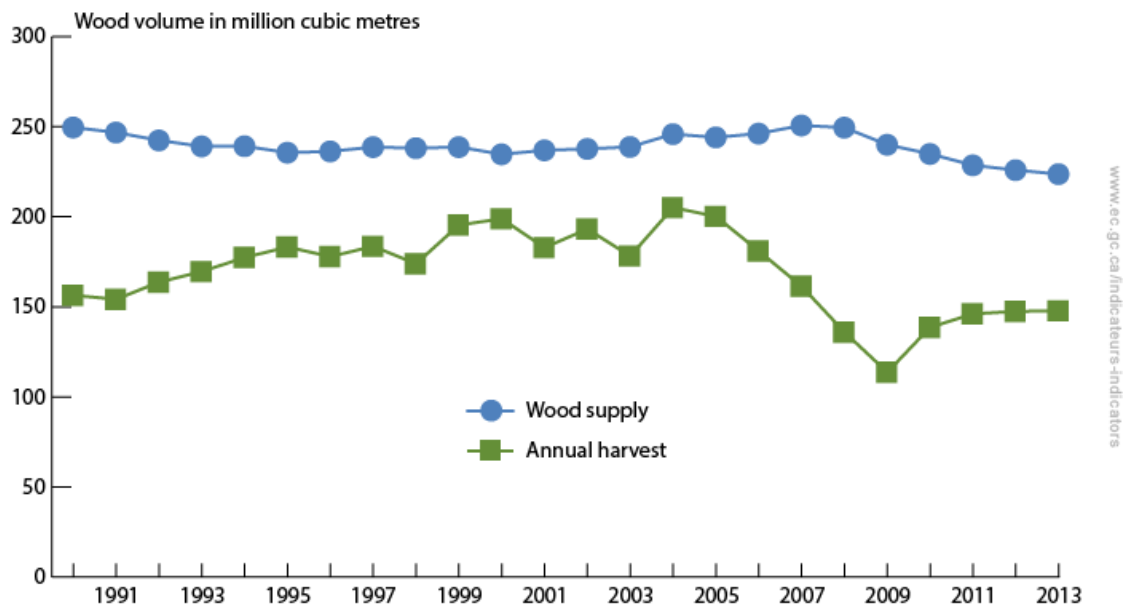
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## Part 1. Sustainability of Timber Harvest Indicator

Between 1990 and 2013, annual timber harvest in Canada ranged from 47% to 85% of the estimated supply of industrial roundwood. Canada's wood supply<sup>1</sup> has remained relatively stable since 1990, at an average of 239 million cubic metres.<sup>2</sup>

The harvest of industrial roundwood<sup>3</sup> reached a peak of 205 million cubic metres in 2004, then declined to a low of 114 million cubic metres in 2009, the smallest harvest in the 1990–2013 period. This pattern is the result of economic factors, such as reduced demand for Canadian lumber due to the collapse in the United States housing market, and reduced global demand for Canadian pulp and paper products. There has been some recovery in recent years as the global economy improves.

**Figure 1. Wood supply and annual harvest of industrial roundwood, Canada, 1990 to 2013**



[Data for Figure 1](#)

**Note:** Wood supply and the harvest data presented are both for industrial roundwood only. For information on total roundwood harvest, which includes industrial roundwood, fuelwood and firewood volumes, see the accompanying data table.

**Source:** [National Forestry Database](#).

<sup>1</sup> Wood supply is the amount of industrial roundwood that could be harvested from an area over a specified period of time while still meeting environmental, economic and social objectives.

<sup>2</sup> Recent declines in wood supply are largely a result of changing provincial forest management objectives.

<sup>3</sup> Harvested industrial roundwood is intended to be delivered to a mill (e.g., logs and bolts, pulpwood) and also includes poles, pilings and some fuelwood.

Canada has 3.47 million square kilometres of forest,<sup>4</sup> representing 35% of Canada's terrestrial area.<sup>5</sup> About 9% of the global forest cover is in Canada.<sup>6</sup>

Sustainable forest management means ensuring that forests provide a broad range of goods and services over the long term. Forest managers plan for harvest levels that will not affect the long-term sustainability of the forest resource. Governments estimate the yearly acceptable level of harvest by estimating the wood supply, which is the maximum volume of wood that can be harvested sustainably. Both the estimated wood supply and the volume of wood harvested fluctuate in response to a wide range of ecological, social and economic factors. Comparing the amount of timber actually harvested to the estimated sustainable wood supply is one way we can track how well we are managing our forests.



This indicator is used to measure progress toward [Goal 5: Biological Resources – Efficient economic and ecological use of resources – Production and consumption of biological resources are sustainable](#) of the [Federal Sustainable Development Strategy 2013–2016](#).

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<sup>4</sup> Natural Resources Canada (2014) [Statistical data – Forest inventory](#). Retrieved on 11 May, 2015.

<sup>5</sup> "Terrestrial," as used here, includes both land and freshwater areas.

<sup>6</sup> Food and Agriculture Organization of the United Nations (2010) [Global Forest Resources Assessment 2010](#). Retrieved on 5 May, 2015.

## Part 2. Data Sources and Methods for the Sustainability of Timber Harvest Indicator

### Introduction

The [Sustainability of Timber Harvest](#) indicator is part of the [Canadian Environmental Sustainability Indicators](#) (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues. This indicator is also used to measure progress towards the goals and targets of the [Federal Sustainable Development Strategy](#).

### Description and rationale of the Sustainability of Timber Harvest indicator

#### Description

This indicator compares the amount of timber harvested with the estimated national wood supply. *Wood supply* is the volume of timber that can be harvested from an area over a specified period of time while meeting environmental, economic and social objectives. Wood supply is for industrial roundwood supplies only and does not include other types of harvest. *Industrial roundwood* refers to harvested trees that are usually intended to be delivered to mills but also includes poles and pilings, and may include trees harvested for energy production, especially if it is factored into the jurisdiction's annual allowable cut (AAC) calculations. Other types of roundwood include fuelwood (used for industrial or institutional energy) and firewood (used for household or recreational energy). Under sustainable forest management, forest managers plan for harvest levels that will not impact the long-term sustainability of the forest resource.

The estimation of wood supply is affected by many factors.<sup>7</sup> Wood supply levels are estimated for those forests that are actively managed for timber, which is a subset of forests and other wooded land. *Forest land* is defined as an "area of land where tree canopies cover more than 10% of the total area, and the trees, when mature, can grow to a height of more than 5 metres. It does not include land that is predominantly urban or used for agricultural purposes."<sup>8</sup> *Other wooded land* is defined as an "area of land where 1) tree canopies cover 5–10% of the total area and the trees, when mature, can grow to a height above 5 metres; or 2) shrubs, bushes and trees together cover more than 10% of the area. These areas include treed wetlands (swamps) and land with slow-growing and scattered trees. They do not include land that is predominantly agricultural or urban."<sup>8</sup>

#### Rationale

Canada is committed to sustainable forest management, which is defined as "management that maintains and enhances the long-term health of forest ecosystems for the benefit of all living things while providing environmental, economic, social and cultural opportunities for present and future generations."<sup>9</sup> The Sustainability of Timber Harvest indicator is one

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<sup>7</sup> Canadian Council of Forest Ministers (2015) [National Forestry Database, Wood Supply – Background](#). Retrieved on 7 April, 2015.

<sup>8</sup> Natural Resources Canada (2014) [The State of Canada's Forests Annual Report 2014](#). Retrieved on 7 April, 2015.

<sup>9</sup> Natural Resources Canada (2015) [Glossary](#). Retrieved on 7 April, 2015.

measure of the success of Canada's forest stewardship. The indicator uses data that are reliably reported year after year.

#### **Recent changes to the indicator**

Reported harvest rates include industrial roundwood harvests only, to better align with wood supply estimates. Information on total roundwood harvests is maintained as supplementary information in the data table. Other reports may cite industrial roundwood harvests or total roundwood harvests, and care should be taken in making comparisons.

Minor adjustments to previous years' data continue to be made as source data are revised and updated.

## **Data**

#### **Data source**

Wood supply and harvest estimates are drawn from the [National Forestry Database](#) (NFD), maintained by the Canadian Forest Service of Natural Resources Canada. The data contained in the NFD are provided by provincial and territorial resource management organizations<sup>10</sup> and federal government departments.

Canada's total area is estimated using the [Atlas of Canada 1,000,000 National Frameworks Data, Administrative Boundaries](#).

World forest area is drawn from the [Global Forest Resources Assessment 2010](#).

#### **Spatial coverage**

The indicator includes all provinces, the Yukon and the Northwest Territories. Nunavut is excluded as it is not a National Forestry Database partner.

#### **Temporal coverage**

Annual estimates from 1990 to 2013 are included.

#### **Data completeness**

Data are updated in the National Forestry Database on a biannual basis, and include all estimates as provided by reporting jurisdictions.

#### **Data timeliness**

The National Forestry Database is updated biannually, with a 14-month time lag. For example, data for 2013 were provided by the provinces, territories and federal agencies in 2014 and totals were published in February 2015. Jurisdictions are provided with an opportunity to update the data if necessary, which are published in June 2015. This indicator is current to the end of 2013.

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<sup>10</sup> Canadian Council of Forest Ministers, National Forestry Database (2015) [Partners](#). Retrieved on 7 April, 2015.

## Methods

The Sustainability of Timber Harvest indicator compares wood supply to industrial roundwood harvest.

*Wood supply*, the volume of timber that may be sustainably harvested, is estimated for each province and territory. Provincial and territorial wood supplies are summed to estimate Canada's wood supply.

Wood supply is the sum of two values:

- 1. The estimated Annual Allowable Cuts (AACs, known as Allowable Annual Cut in British Columbia) for provincial Crown lands, i.e., publicly owned lands under provincial jurisdiction.**

This is the volume of industrial roundwood, as estimated by professional foresters, which may be harvested each year from provincial Crown lands. Provincial Crown lands make up 77% of Canada's forest and other wooded land, but the proportion varies by province (details on forest ownership by province can be found in [The State of Canada's Forests Annual Report 2011](#)). Most provinces establish AAC levels for their Crown lands based on a policy of maintaining a non-declining future wood supply and considering a range of additional factors. For example, AAC levels may be decreased in order to maintain animal habitat or increased to permit salvage of insect-damaged wood. The importance of individual factors to the AAC varies among provinces and even among forest management areas within provinces, due to regional differences in forestry policies. The extensive rationale behind an AAC determination for an individual forest management area falls under provincial jurisdiction; additional information may be obtained from provincial resource management organizations.<sup>11</sup> The volume of wood harvested may be above or below the AAC in any one year, but needs to balance out over the regulation period. AACs are set based on an assessment of a wide range of ecological, social and economic factors, and are therefore only a proxy for the sustainable level of harvest.

and

- 2. Estimates of wood supply on federal, territorial and private lands.**

Federal, territorial and private lands account for 2%, 13% and 6%, respectively, of Canada's forest and other wooded land. Wood supply estimates are based on sustainable management plans (when available) or on past harvest levels. Estimation methods are not standardized and may or may not be similar to those used for the AAC.

Because historical harvests are often used to estimate wood supply, recent declines in harvest levels have led to a decreased estimate of wood supply in some jurisdictions. This does not necessarily imply a change in forest health or harvest sustainability.

The 2013 ownership breakdown of wood supply by province and territory is available from the National Forestry Database.<sup>12</sup>

*Industrial roundwood harvest* volumes refer to [roundwood](#), which includes sections of tree stems (with or without bark), logs, bolts, pulpwood, posts and pilings. Industrial fuelwood and household firewood are not usually included as part of the industrial roundwood harvest,

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<sup>11</sup> Canadian Council of Forest Ministers (2015) [National Forestry Database, Partners](#). Retrieved on 7 April, 2015.

<sup>12</sup> Canadian Council of Forest Ministers (2015) [National Forestry Database, Wood Supply – Jurisdictional Tables](#). Retrieved on 7 April, 2015.



although they contribute to the total roundwood harvest. Other forest products such as Christmas trees are not included.

Canada's total industrial roundwood harvest is the sum of the following:

**1. The reported industrial roundwood harvested from provincial Crown lands.**

Provincial laws require harvest from such lands to be reported and compared to the AAC value for individual forest management areas. Although the harvest must not exceed the AAC over multi-year regulation periods, a deviation by as much as 50% may be allowed in a given year. Regulation periods are 5 to 10 years in most cases.

and

**2. The industrial roundwood harvested from federal, territorial and private lands.**

Because there is generally no legislated mechanism to report harvest on these lands, these volumes are estimated by either provincial or federal forest authorities located in that jurisdiction. Harvest from such lands is not regulated, meaning that harvesters are not required by law to compare their harvest to a sustainable level.

The proportion of global forest area in Canada is calculated by dividing the total area of Canada's forests by the world forest area.

## Caveats and limitations

- In some cases, figures are either unavailable or too small to be expressed or included in the national aggregate values. Detailed caveats on the quality or completeness of annual data from individual provinces and territories, including explicit indications of which data are estimates, can be found by generating customized reports from the [National Forestry Database](#) (NFD). Supply and harvest can be viewed by year, wood type (hardwood/softwood) and land jurisdiction (provincial, private, federal and territorial) using this database.
- National aggregation can mask Crown harvests above or below the Annual Allowable Cut (AAC) in individual provinces. Similarly, the provincial aggregates can mask variability among management areas. If harvest above the AAC occurs in a portion of a regulation period, it may be balanced at another time or location such that the overall AAC of the regulation period is not exceeded.
- As noted in the Methods section, AACs are only a rough approximation of wood supply on Crown lands, as forest management agencies consider many policy factors beyond the ecological sustainability of the forest when they set the level of allowable harvest.
- A large percentage of forest land in Atlantic Canada is privately owned. According to the [State of Canada's Forests 2011](#), forest land is 50% private in New Brunswick, while it is 68% private in Nova Scotia and 91% private in Prince Edward Island. In Newfoundland and Labrador, forest land is 99% provincially owned, but 69% of the timber rights to Crown land on the island of Newfoundland are leased on 99-year leases to pulp and paper companies, and so it is treated as private property. Because of the high percentage of private lands in Atlantic Canada, provincial agencies that determine AACs also must assess the potential timber supply on private lands. Because private woodlots are not regulated by legislation, there is uncertainty associated with this portion of the wood supply equation. However, as the Atlantic region only accounts for about 9% of Canada's total wood supply, the uncertainty on a national scale is small.

- Wood supply estimates for private lands are often based solely on the average of actual past harvests, which are generally unregulated. Although estimates are provided, it is difficult to be certain whether harvest is sustainable for these lands.
- The Canadian Environmental Sustainability Indicators (CESI) program uses the total area of Canada (land and water) to calculate the proportion of the country covered by forest. About 35% of Canada's terrestrial area is covered by forest.<sup>13</sup> The *State of Canada's Forests Annual Report* and the National Forestry Database also report that an additional 5% of Canada's land is covered by "other land with tree cover" and "other wooded land."

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<sup>13</sup> "Terrestrial," as used here, includes both land and freshwater areas.

## Part 3. Annexes

### Annex A. Data tables for the figures presented in this document

**Table A.1. Data for Figure 1. Wood supply and annual harvest of industrial roundwood, Canada, 1990 to 2013**

Year	Wood supply (million cubic meters)	Industrial roundwood harvested (million cubic meters)	Wood supply harvested (%)	Total roundwood harvested (million cubic meters)
1990	249.6	156.4	63	162.6
1991	246.8	154.2	62	160.9
1992	242.4	163.7	68	170.1
1993	239.1	169.6	71	176.0
1994	239.2	177.4	74	183.3
1995	235.6	183.2	78	188.5
1996	236.3	177.9	75	183.4
1997	238.7	183.6	77	188.8
1998	238.1	173.9	73	177.0
1999	238.7	195.4	82	198.3
2000	234.7	198.9	85	201.8
2001	236.9	182.9	77	185.9
2002	237.7	193.2	81	196.1
2003	238.8	178.2	75	181.1
2004	245.9	205.1	83	207.9
2005	244.1	200.2	82	203.3
2006	246.2	181.0	74	184.0
2007	250.7	161.4	64	164.6
2008	249.5	136.0	55	139.3
2009	240.0	113.7	47	116.8

Year	Wood supply (million cubic meters)	Industrial roundwood harvested (million cubic meters)	Wood supply harvested (%)	Total roundwood harvested (million cubic meters)
2010	234.9	138.6	59	141.9
2011	228.6	146.1	64	149.9
2012	225.9	147.5	65	151.4
2013	223.7	147.8	66	152.1

**Note:** The "total roundwood harvested" column includes harvest of industrial roundwood, fuelwood and firewood.

**Source:** [National Forestry Database](#).

## Annex B. References and additional information

### References and further reading

[Canada's National Forest Inventory \(undated\)](#) Retrieved on 7 April, 2015.

Canadian Council of Forest Ministers (2014) [National Forestry Database](#). Retrieved on 7 April, 2015.

Canadian Council of Forest Ministers (2015) [Sustainable Forest Management in Canada](#). Retrieved on 7 April, 2015.

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Natural Resources Canada (2015) [Forestry in Canada](#). Retrieved on 7 April, 2015.

### Related information

[Natural Resources Canada – Forestry in Canada: Key facts](#)

**[www.ec.gc.ca](http://www.ec.gc.ca)**

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