



NATURAL RESOURCES CANADA - INVENTIVE BY NATURE

Collaboration and Change in Canadian Forestry

Trees4Future Conference – Designing Trees for the Future

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Natural Resources
Canada

Ressources naturelles
Canada

Canada

OUTLINE

- Canada at a Glance
- Sustainable Forest Management
- The Canadian Forest Service
- Regional Snapshots
- Federal Leadership - Genomics
- A Changing Climate



Canada at a Glance



Source: The State of Canada's Forests. Annual Report 2015. 2015. Natural Resources Canada
<https://www.nrcan.gc.ca/forests/report/16496>

A Vast Federation of Forestry



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Canada at a Glance



348 million
hectares

92% public

Annual harvest
< 0.2%

Provincial
forest
management

1.1% of GDP
(\$20.8 billion)

\$20.7 billion
balance of trade

A Diverse Federation of Forestry



Sustainable Forest Management



Canada has:

348 million hectares
of forest

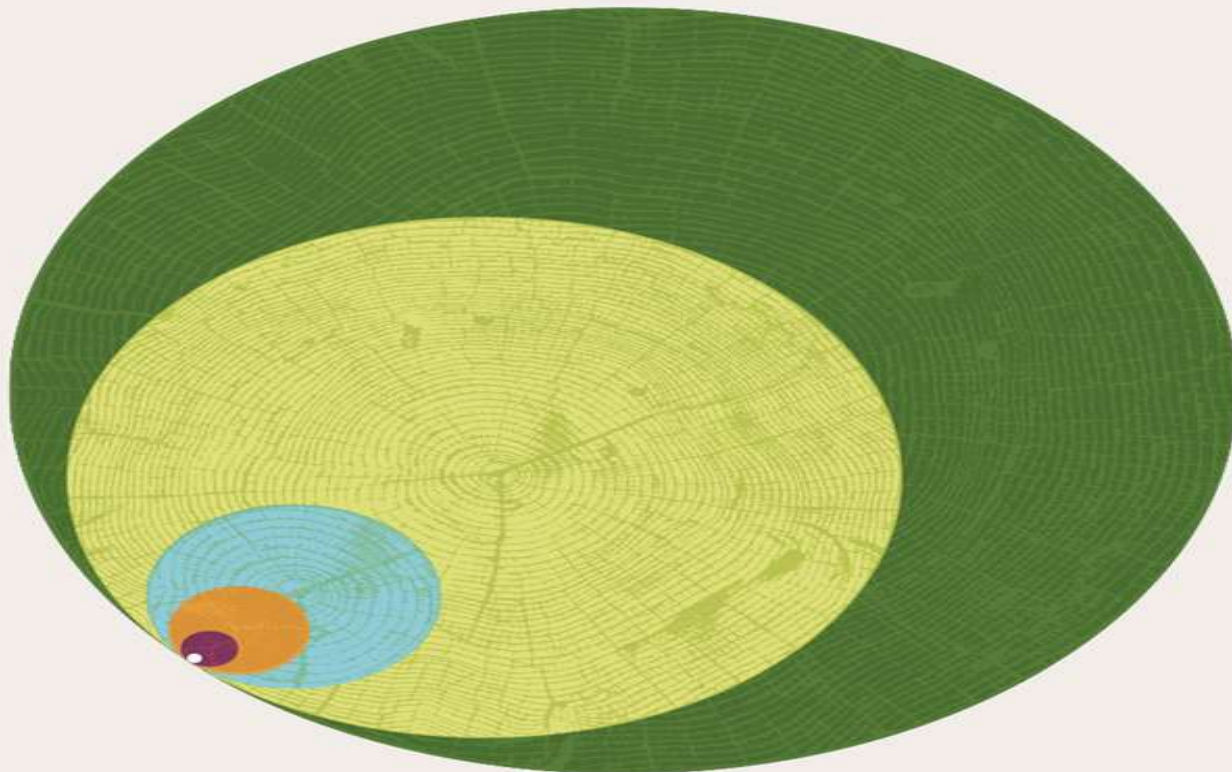
161 million hectares
of forest
**independently
certified as
sustainably
managed** (2014)

20.1 million hectares
of forest
**damaged by
insects** (2013)

4.6 million hectares
of forest **burned
in forest fires**
(2014)

0.74 million hectares
of forest
harvested (2013)

0.05 million hectares
of forest
deforested (2013)



The Canadian Forest Service



Role of Federal Gov't

- Int'l trade/relations
- Indigenous; Northern affairs
- National policy; regulations and reporting
- Federal lands
- **Research**
- **Environment**



British Columbia: Forests from Sea to Sky

Geography:

- 3rd largest province (944,735 km²)
- Stretching over 7 forest regions

Forestry:

- 96% provincial land ownership
- 71,135,000 cubic metres harvested (2013)
- Over \$16b economic impact (2014)

Tree Improvement Practice:

- Provincial breeding programs
- 100 seed orchards; 14 eco-systems; 12 species
- 225m seedlings planted annually
- Continual genetic improvements



Quebec: Great Lakes and Boreal Forests



Geography:

- Largest province (1,542,056 km²)
- Boreal and Great Lakes forest regions

Forestry:

- 89% provincial land ownership
- 26,384,000 cubic metres harvested (2013)
- Over \$15.5b economic impact

Tree Improvement Practice:

- Provincial management: seedling production/distribution
- 130 million seedlings annually
- Traditional and clonal forestry

New Brunswick: Coastal Acadian Forest

Geography: 3rd smallest province; Acadian forest

Forestry: 50% private ownership; \$1.6b exports (2014)

Tree Improvement Practice:

- Provincial and industry collaboration: Traditional and clonal practices
- Provincial tree nursery: @ 20 million seedlings/a since 1995 (@200m)
- JD Irving: >320m improved seed seedlings since 1979



Federal Leadership - Genomics

GENOMICS R&D INITIATIVE

Supporting genomic research across 8 federal departments

Over \$30m in forestry since 1999

GENOME CANADA Over \$47m since 2000

- POPCAN - \$5m
- AdapTree - \$2.3m
- SMarTForests - \$5m
- TAIGA - \$2m

Canadian Foundation for Innovation (CFI)

Funding state-of-the-art research facilities
\$1.33 billion committed in 2015

CFS TOP COMMITMENT (2013)

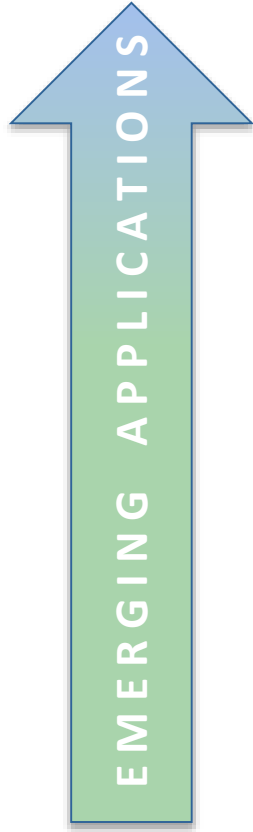
Top Priority:

- Senior management attention
- Resources
- Staff

Supporting Innovation

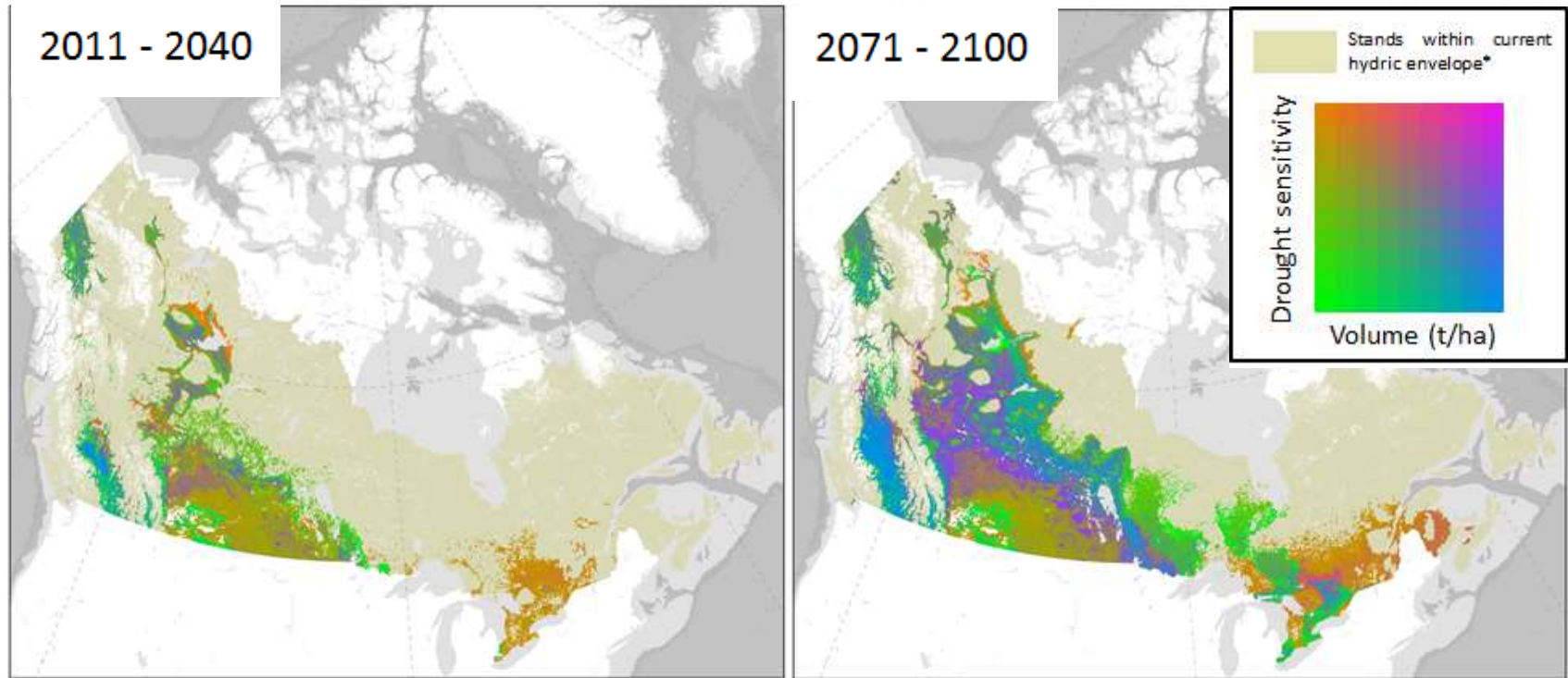


Growing Forward



- **Genomic Selection (GAPP-FastTRACK)**
Spruce growth, wood fibre, pest and drought resistance
- **Biosurveillance (GAPP)**
Early identification of invasive pathogens and insects
- **Climate Matching**
Right trees in changing climate areas
- **DNA Fingerprinting**
Source and quality assurance
- **Biomass Conversions**
Environmentally acceptable conversions
- **Metagenomics**
Forestry impacts on soil diversity

A Changing Climate



Source: Prepared by Natural Resources Canada, 2015, from A. Beaudoin, et al. Mapping attributes of Canada's forests at moderate resolution through kNN and MODIS imagery. *Can. J. For. Res.*, 2014, 44, 10.1139/cjfr-2013-0401; Hogg 1994: Climate and the southern limit of the western Canadian boreal forest. *Can. J. For. Res.*, 24(9): 1835-1845; McKenney et al. 2011: Customized spatial climate models for North America. *Bull. Am. Meteorol. Soc.*, 92, 1611-1622

Forest Vulnerability to Drought



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THANK YOU!



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