Adaptation of forest and forest sector - Perspectives from Canada

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Outline

- Facts on Canada's forests and forests sector
- Adaptation challenges
  - Monitoring
  - Moving to a policy pull
  - Delivering actionable science
- Some Canadian initiatives
- Moving forward on adaptation

Facts on Canada's forests

- Vast – almost 400M ha
- Remote from populated areas
- Diverse - 10 forest regions
- 300M ha of boreal forest

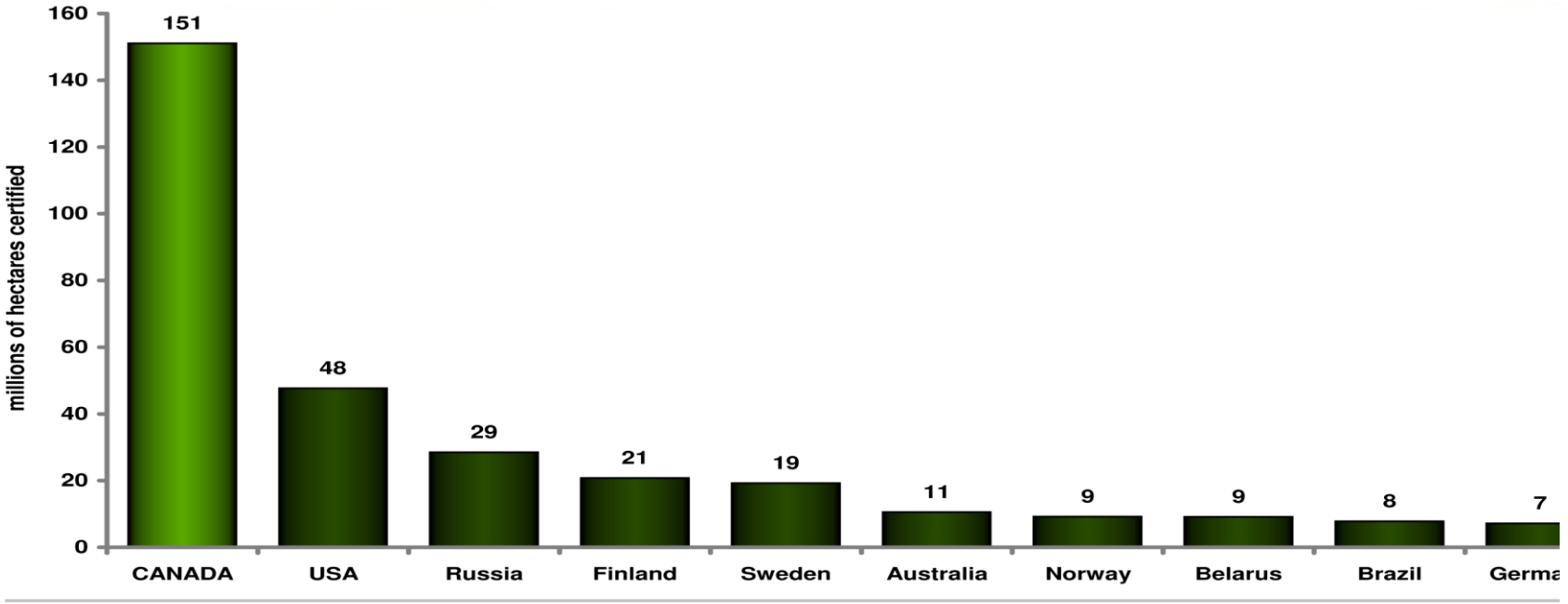
Facts on Canada's forests - Governance

Canada's forest sector includes a broad range of stakeholders…

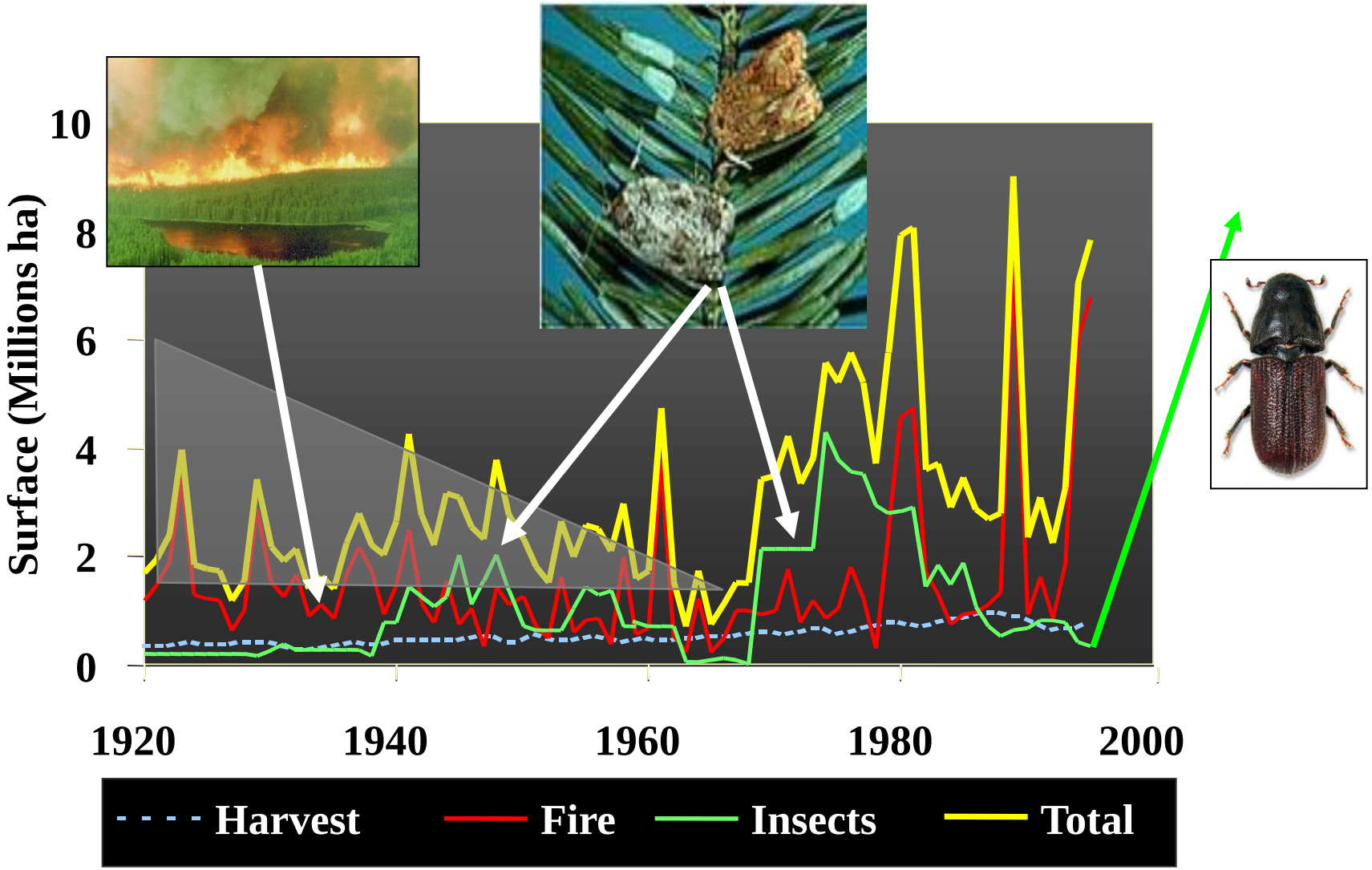
- 93% is publicly owned
- 77% is under provincial jurisdiction (lands and resources management)
- The forest industry has management responsibilities through legal arrangements with provinces
- Home to 80% of aboriginal communities who have co-management agreements
- Over 200 forest-based communities

Facts on Canada's forests – Management

- 91% has its original forest cover
- 1% harvested annually
- 250 Mha is managed forest
- Slow growth rate → long term planning
- Sustainable Forest Management – 3rd party certification

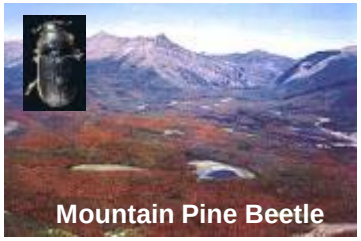


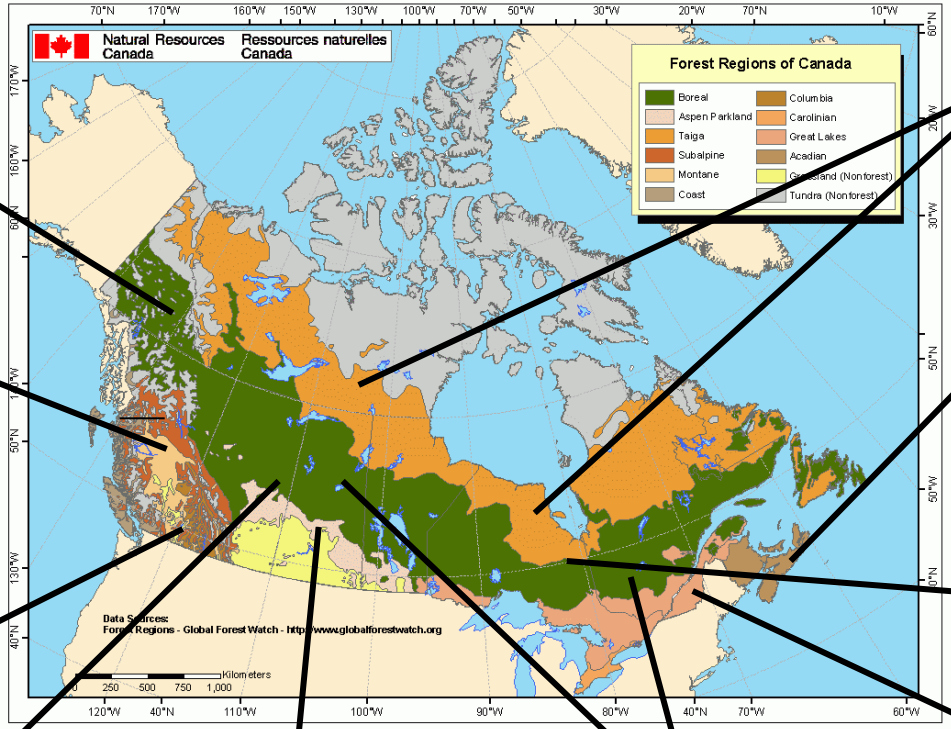
The boreal forest is defined by disturbances



Source: Kurz et Apps, 1999 (modifié)

Climate Change impacts are already evident





“The future ain't what it used to be”

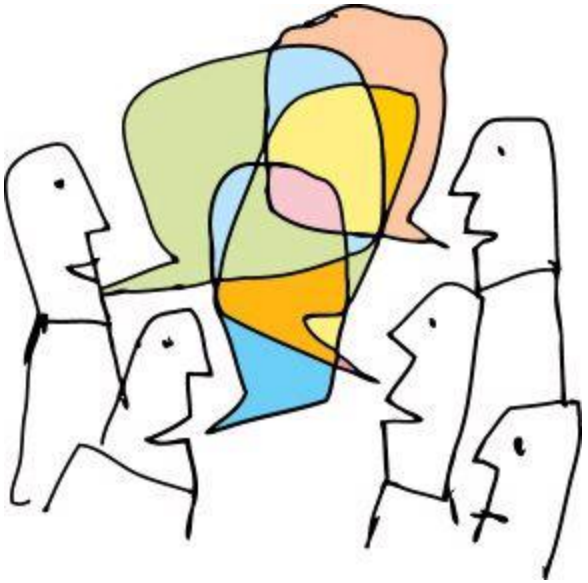
-Yogi Berra

Adaptation to climate change

Reinventing the way we do business

Trans-disciplinarity

Multiple scales



Uncertainty

Knowledge Exchange

Science-policy integration

Complexity

Tracking Climate Change Impacts

- It is difficult to isolate the impacts of climate change
- Monitoring is necessary to validate models and to make adaptation decision: Where and how to adapt?

In Canada,

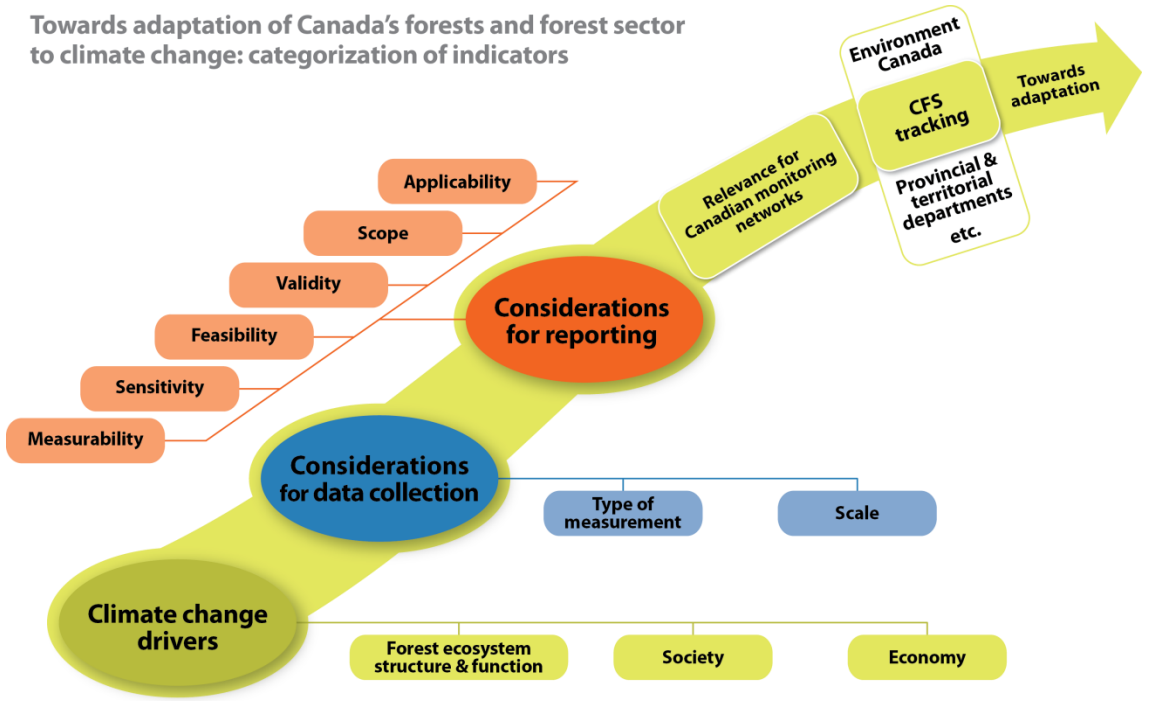
- Monitoring is particularly highly resource consuming given the size and remoteness of our forests
- Information is collected and compiled for many different reasons and by several agencies, institutions and industries

Tracking Climate Change Impacts - Adressing the challenge

- Coordinating efforts among organizations / jurisdictions
- Building on existing monitoring systems

Tracking Climate Change Impacts - Adressing the challenge

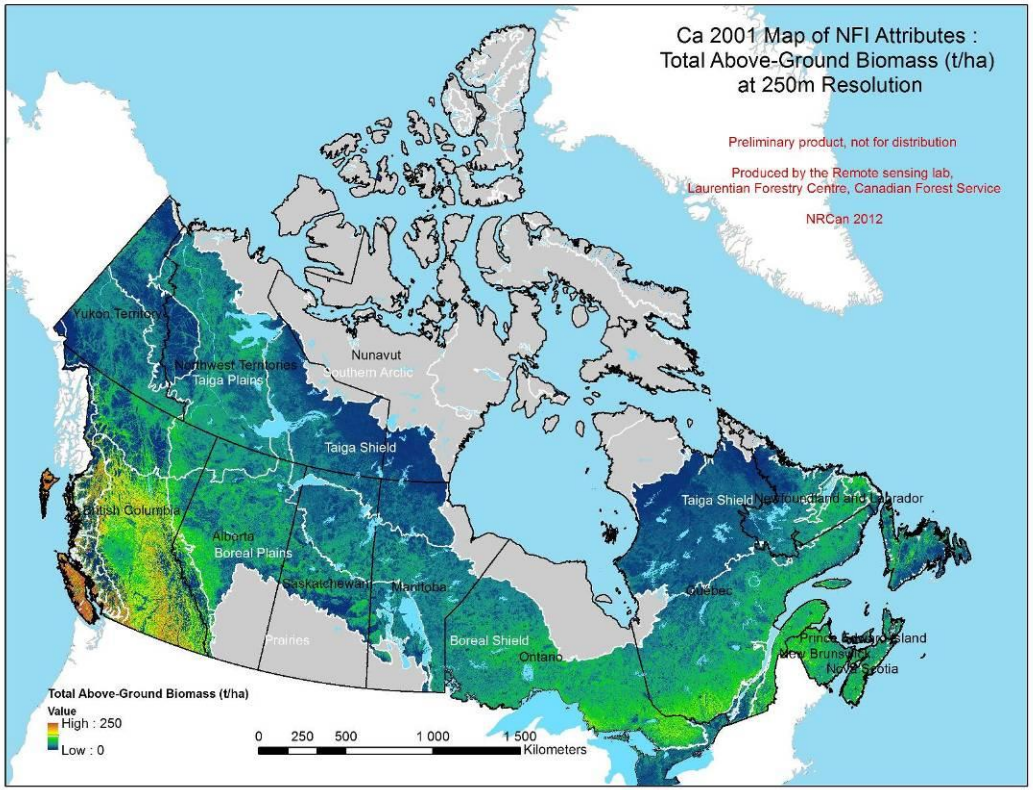
- Focusing monitoring efforts to report on selected indicators that are directly relevant and useful for decision-makers



Gauthier, S., Burton, P., and others

Tracking Climate Change Impacts - Adressing the challenge

- Optimizing the use of remote sensing



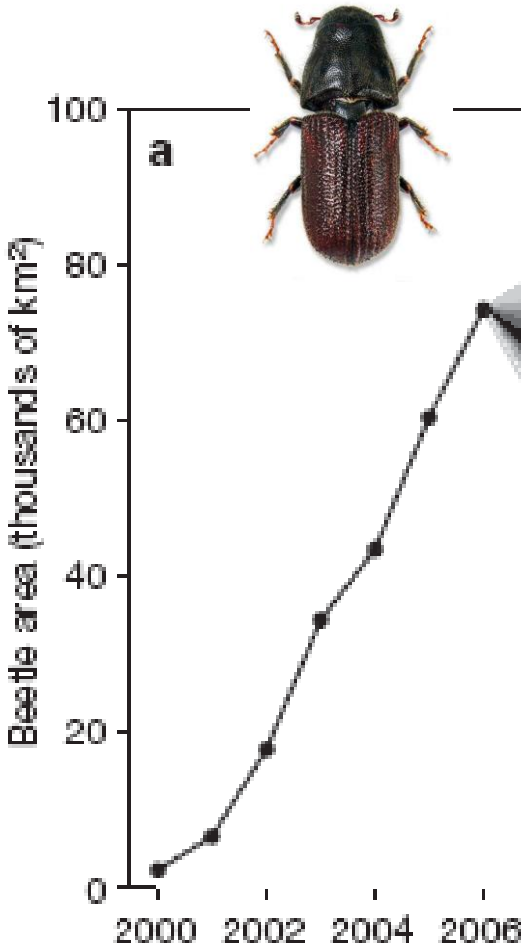
Ressources naturelles Canada
Natural Resources Canada

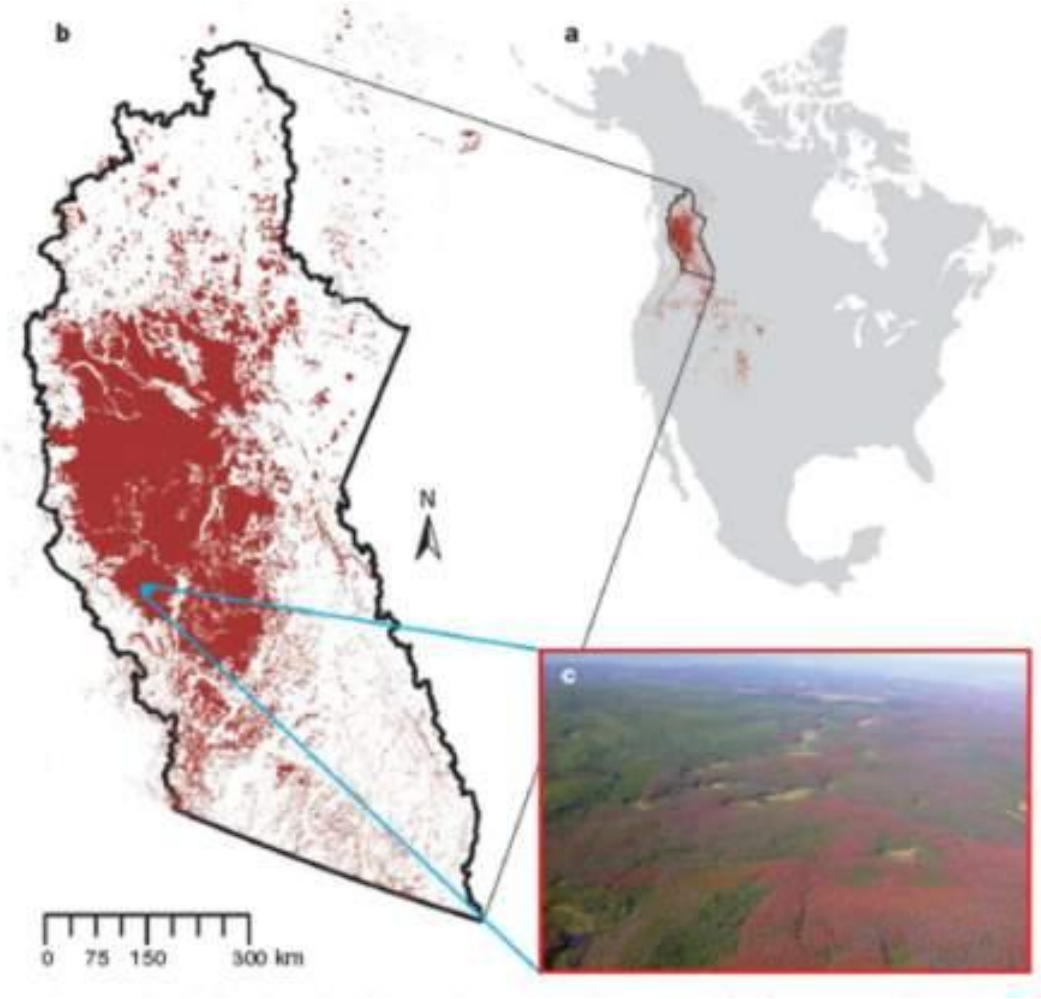
Beaudoin, A. and Bernier, P.

Moving from a science push to a policy pull

- Establishing connections between biophysical and socio-economic impacts
- Adaptation is place-based but can be significantly fostered by political awareness and engagement

Catastrophic impacts raise awareness…





Kurz et al. 2008

… trigger reactive adaptation…

… and create a policy pull

A provincial example:

Future Forest Ecosystem Initiative (BC government, 2006)

> "**adapting British Columbia's forest and range management framework** so that it continues to maintain and enhance the resilience and productivity of B.C.'s ecosystems as our climate changes."

Future Forests Ecosystem Science Council allocated $5.5M to research

Forest Stewardship Action Plan for Climate Change Adaptation issued a policy on assisted migration for larch, and seed transfer zones.

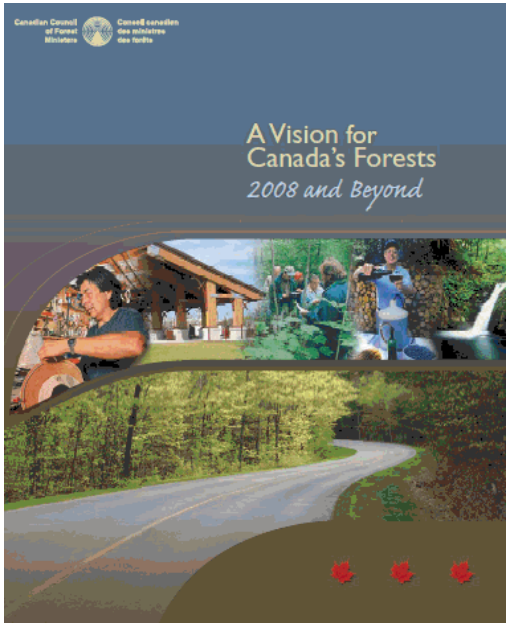
Natural Resources Canada

Future Forest Ecosystems Initiative

… and create a policy pull

A national example:

Jan 2008 – Premiers (CoF) ask their Forest Ministers to collaborate with the federal government on adaptation.



Canadian Council of Forest Ministers

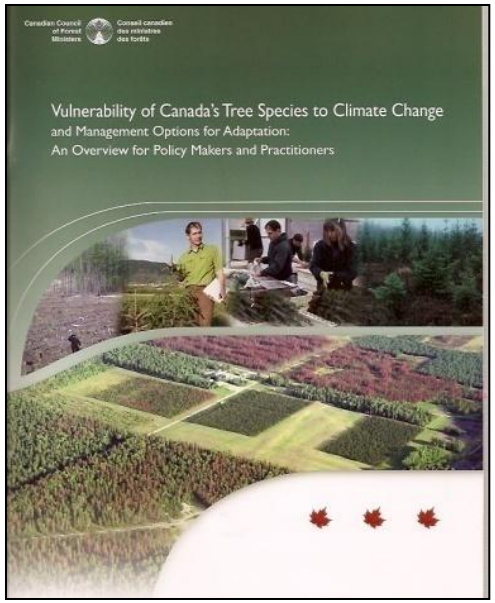
A Vision for Canada's Forests: 2008 and Beyond

"Consideration of climate change and future climatic variability is needed in all aspects of sustainable forest management."

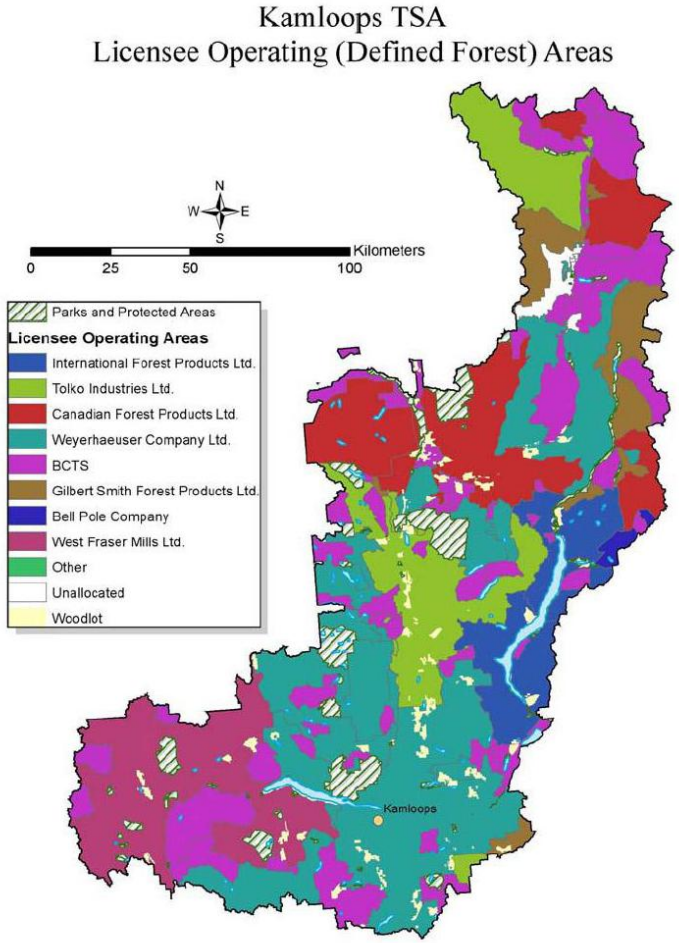
Canadian Council of Forest Ministers – Climate Change Task Force

- Phase 1
  - Vulnerability of Canada's Tree Species to Climate Change and Management Options for Adaptation (Johnston et al. 2009)

- Phase 2
  - tools, approaches, and state-of-the-knowledge information to members of Canada's forest sector to enable the incorporation of climate change considerations into all aspects of sustainable forest management



Canadian Council of Forest Ministers – Climate Change Task Force

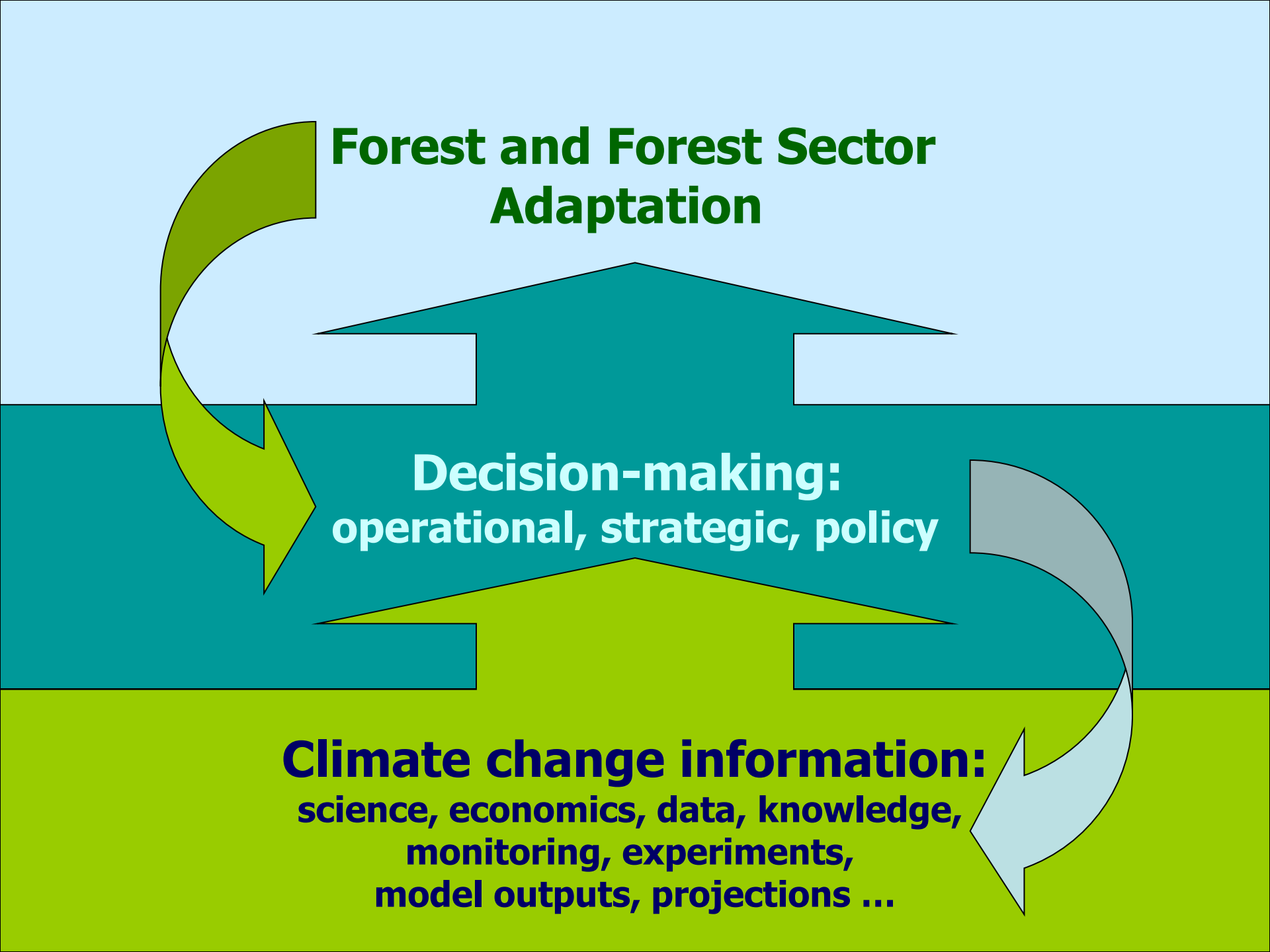


A national example:

- CCFM – CCTF analysed 10 case studies from coast to coast conducting
- Various scales/contexts: watershed, forest region, forest management agency, forest-dependent community
- Vulnerability assessment
- Identification of enabling factors, key vulnerabilities and outcomes
- Process as valuable as results

From science to action
Actionable science

- Forest management requires long-term investments and planning – especially in Canada
- Climate change is creating greater uncertainty
- Decision making happens at different levels and involves a broad range of stakeholders
- Adaptation efforts are directed toward maintaining forest values and services – need for risk assessments and trade-off analysis
- Integration of knowledge across disciplines


Forest and Forest Sector Adaptation
Decision-making:
operational, strategic, policy
Climate change information:
science, economics, data, knowledge,
monitoring, experiments,
model outputs, projections ...

From science to action
Actionable science

A national example: Forest Change is the Canadian Forest Service contribution to the Government of Canada Adaptation Program (2011-2016)

Canada

From science to action
Actionable science

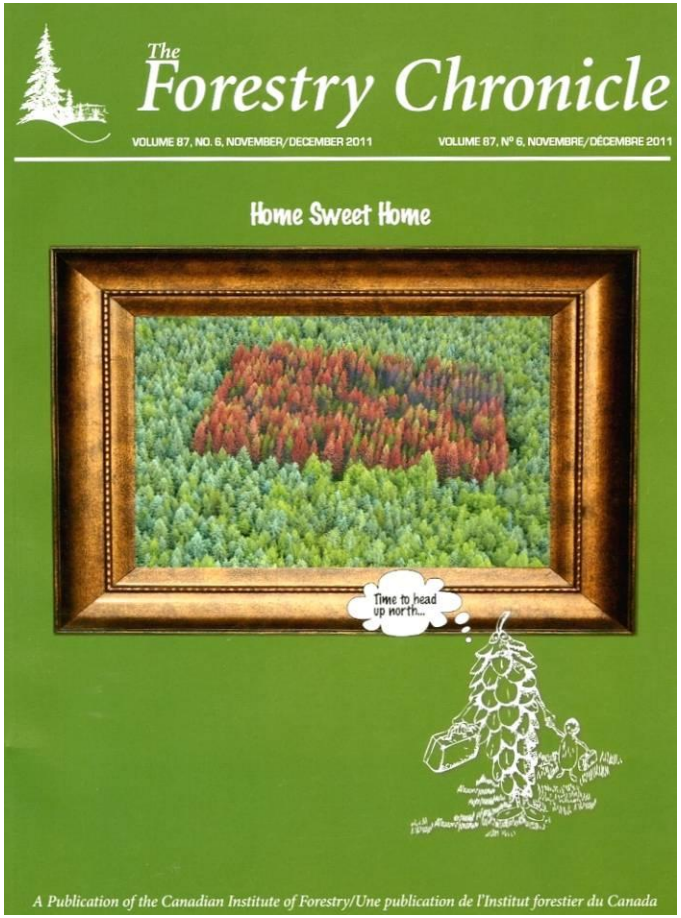
FOREST CHANGE:

Enhancing Competitiveness of Canada's Forest Sector in a Changing Climate

increasing the availability, accessibility and applicability of climate change information

Core team: Catherine Ste-Marie, Pierre Bernier, Phil Burton, Brian Eddy, Sylvie Gauthier, Dan McKenney, Elizabeth Nelson, Richard Parfett, Tim Williamson

From science to action
Actionable science



Synthesis on Assisted Migration

- Introduction;
- Ecological Implications and Constraints;
- Vulnerability assessment tools;
- The Debate - Socio-Ethical considerations;
- The Practice of Assisted Migration;

From science to action
Actionable science

An industry example:

TOLKO

INDUSTRY

WOOD PRODUCT MANUFACTURING

EMPLOYEES (2010)

2,200

TOTAL SALES (2010)

over C$50 MILLION

KEY ADAPTATION DRIVERS

Commitment to sustainable forest management practices, and recognition that forest management is directly impacted by a changing climate

Recent climate-related impacts on operations

ADAPTATION TO CLIMATE CHANGE

Working in partnership with government, First Nations, researchers and industry representatives to guide future forest management

Changes to site selection, planting, and forest yield forecasting

BUSINESS BENEFITS

More resilient woodland

BUSINESS CHALLENGES

Cost and lack of economic incentives

From science to action
Actionable science

→Learning to communicate between the range of stakeholders

Scientific Words	Non-scientific Meaning	Better Words
Enhance	Improve	Intensify, increase
Uncertainty	Not knowing	Range
Risk	Low-probability event	Probability
Error	Wrong, incorrect	Uncertainty associated with a measuring device or model
Bias	Unfair and deliberate distortion	Offset from the observed value
Positive trend	A good trend	Upward trend
Positive feedback	Constructive criticism	Self-reinforcing cycle, vicious circle
Theory	A hunch, opinion, conjecture, speculation	Physical understanding of how this works

Moving forward on adaptation

Monitoring

- Coordination of efforts
- Focus on information relevant for decision-making
- Optimization of the use of new technologies (RS)

Leadership

- Awareness of the issue and support from political leaders is a powerful accelerator

Knowledge Exchange – Usable science

- Availability, Accessibility and Applicability of science
- Involvement of end-user from the onset and throughout the development of knowledge products

Moving forward on adaptation

Synthesis and Integration of knowledge

- Need for common languages, shared ‘’currencies’’, scenarios
- Multi-disciplinary teams
- Adress the multiple values of forests - trade-off analysis and dialogue among stakeholders

Flexibility for innovative management approaches

The Canadian Way