



Forest Change

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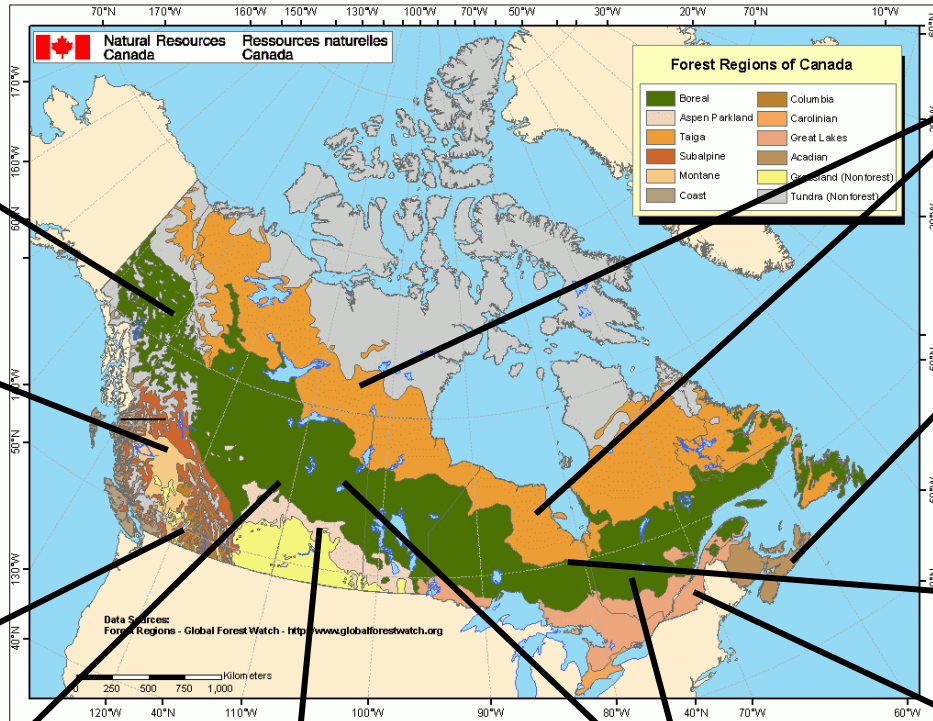
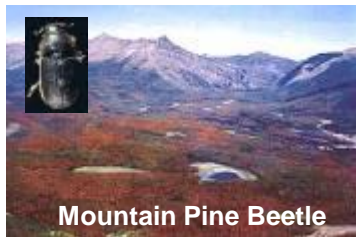


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Climate Change impacts are already evident



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

In budget 2011, Government of Canada announced a new adaptation program which includes funding for the Canadian Forest Service.

Forest Change is CFS contribution to this new program.



Forest governance in Canada

- 77% of Canada's forest is under provincial jurisdiction
- The forest industry has management responsibilities through legal arrangements with provinces



Canadian Forest Service (CFS) contribution to forest sector adaptation

- CFS is a science-based policy organization
- There is already significant capacity and knowledge in climate change science in the CFS and globally
- Decision-makers often say that there is ***too much information!***
- Information has to be available and accessible. It also has to be applicable



Forest and Forest Sector Adaptation



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graph LR; A[Climate change information: science, economics, data, knowledge, monitoring, experiments, model outputs, projections ...] --> B[Decision-making: operational, strategic, policy]; B --> C[Forest and Forest Sector Adaptation]; C --> B; A --> B
```

**Decision-making:
operational, strategic, policy**

Integration of knowledge across disciplines

Climate change information:
science, economics, data, knowledge,
monitoring, experiments,
model outputs, projections ...

Forest Change Portal:

A focal point for information and tools

1. **A tracking system** that reports on indicators of climate change impacts to identify forest sector vulnerabilities
2. **An adaptation toolkit** of actionable science for sustainable forest management under a changing climate
3. **Integrated assessment** of climate change implications for the forest sector to guide policies and investment



Tracking Climate Change Impacts

- Monitoring is necessary to make adaptation decision – Where and how to adapt?
- Monitoring is 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 in Canada



Tracking Climate Change Impacts

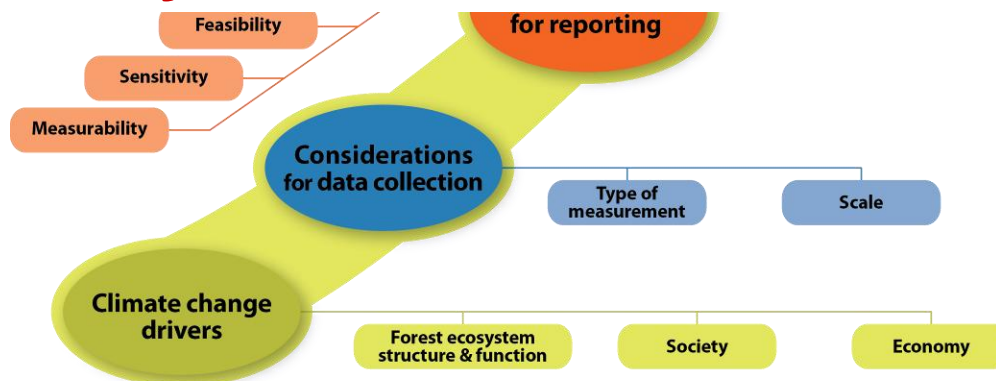
- The *diagnosis tool*

- To report on relevant and useful indicators
- Building on existing monitoring efforts
- Optimizing the use of new technology

Towards adaptation of Canada's forests and forest sector to climate change: categorization of indicators



Opportunity for cross-border collaboration



The Adaptation Toolkit

- Actionable science – projection tools

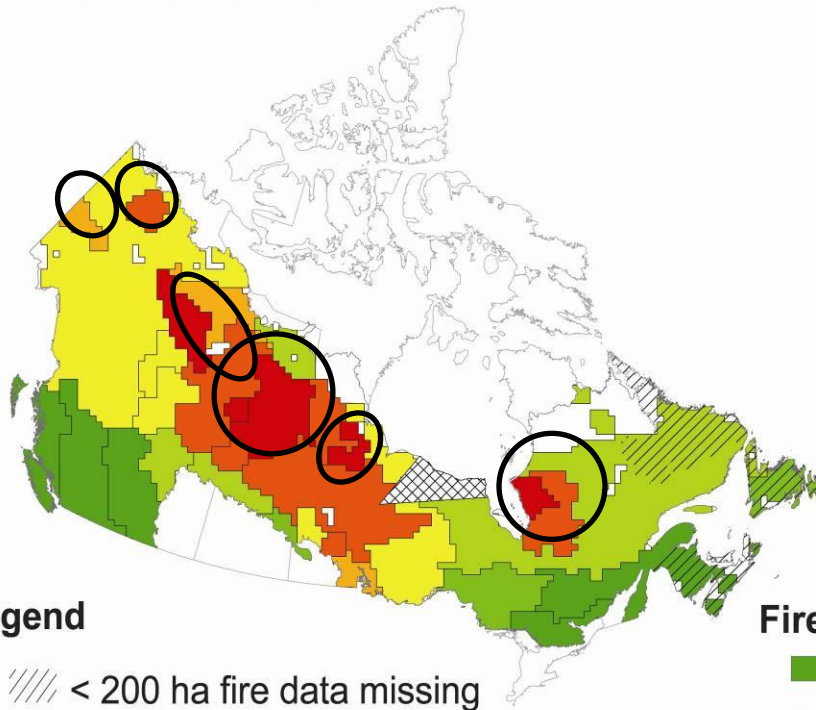
- Building on existing work
- Consultation with end-users from the beginning and throughout the development of information products
- Integration of knowledge across disciplines



Disturbance Zonation

Yan Boulanger, Sylvie Gauthier & Philip. J. Burton

A) HFR zonation

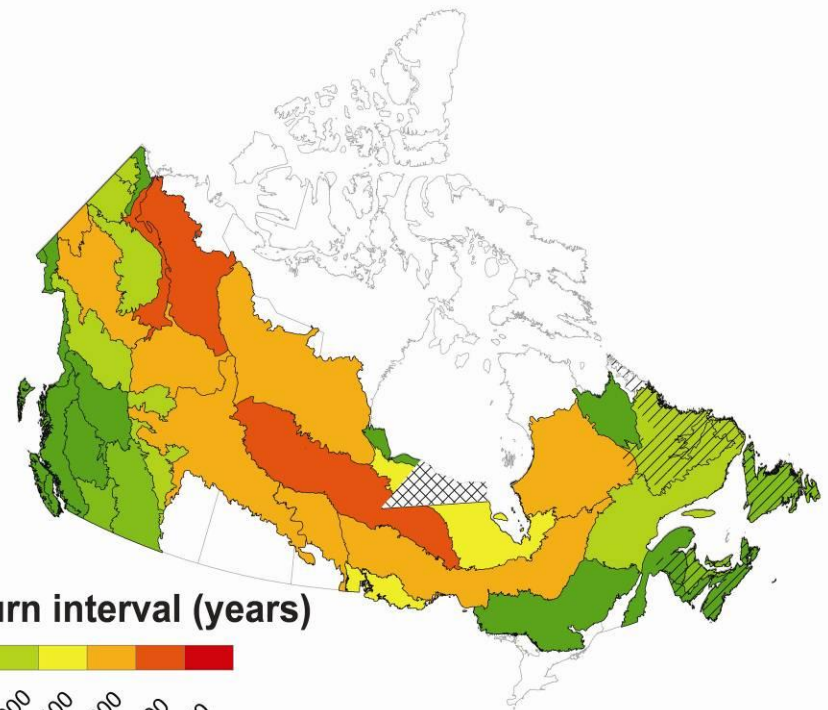


Legend

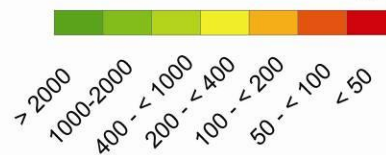
//// < 200 ha fire data missing

XXXX No fire data

B) Ecoprovinces



Fire return interval (years)



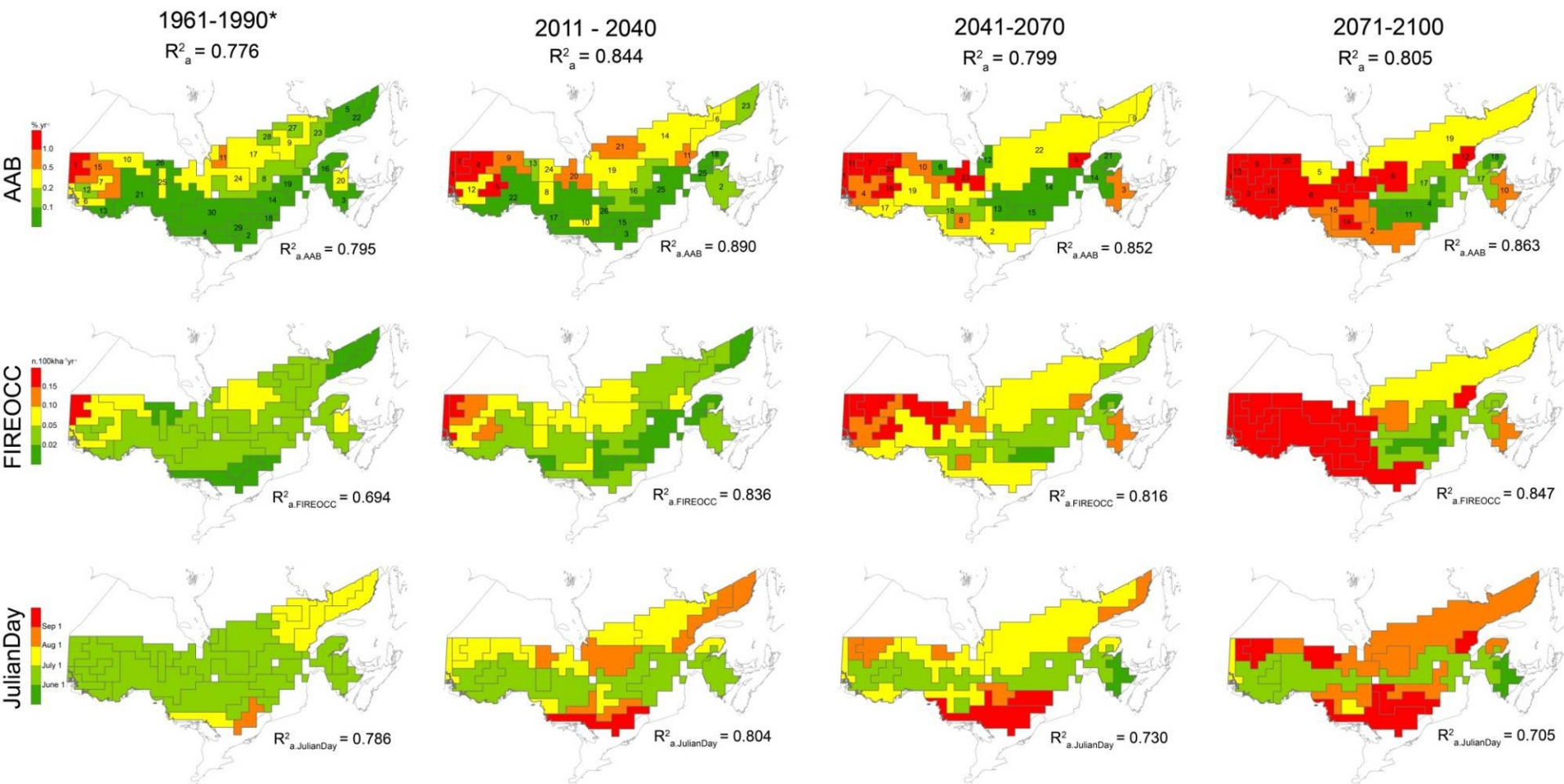
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Projected fire regimes

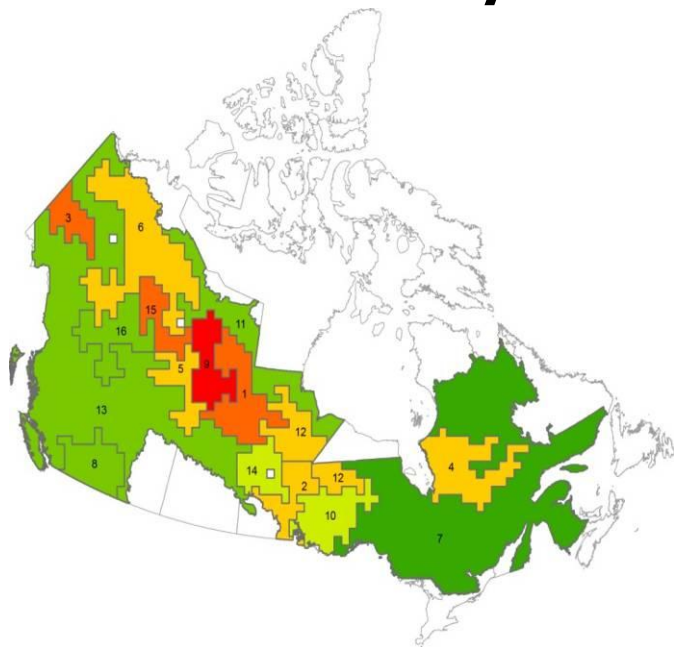
Yan Boulanger, Sylvie Gauthier & Philip. J. Burton



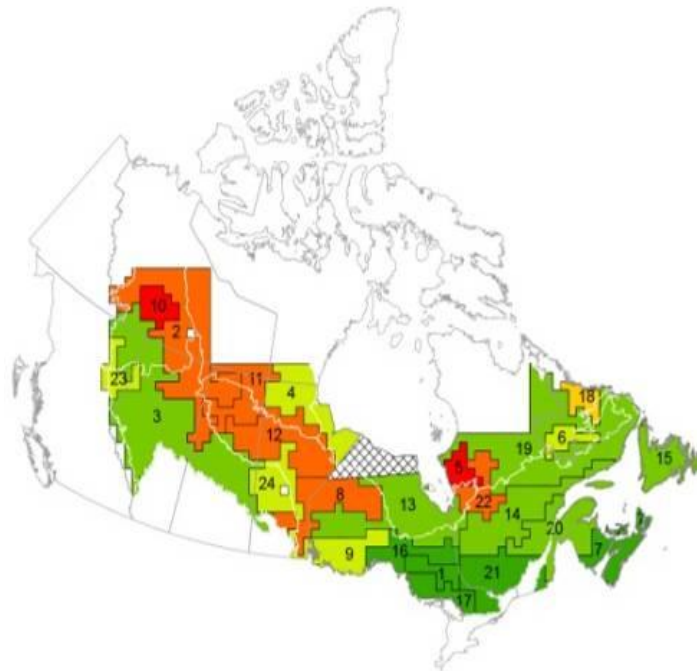
Zonation FIRE x SBW

Yan Boulanger, Sylvie Gauthier & Philip. J. Burton

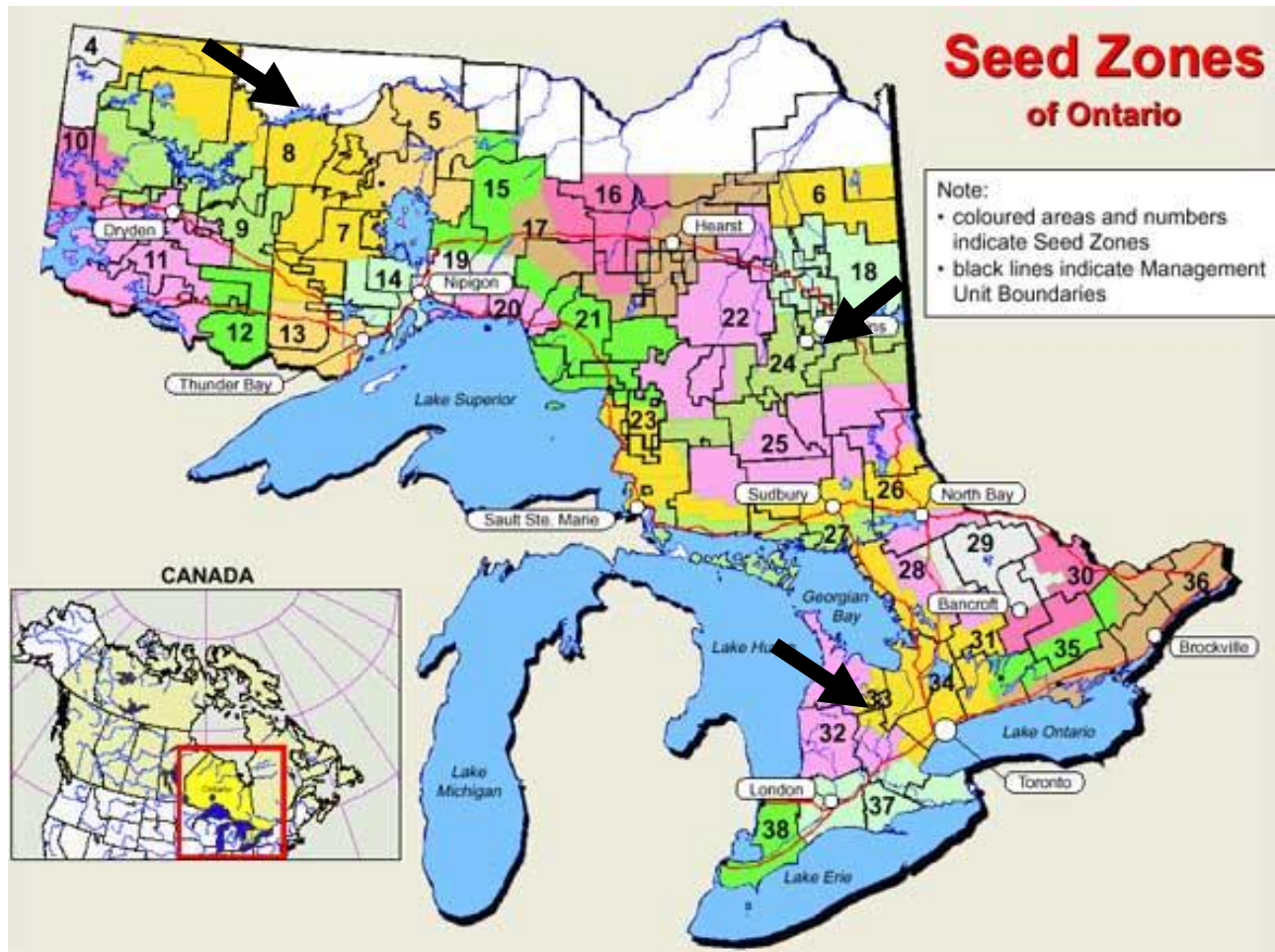
Fire data only



Fire x SBW



Informing seed transfer decisions



Ontario Ministry of Natural Resources



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Seedwhere

Dan McKenney and his team

Canadian Forest Service (CFS)

CFS Home

Seedwhere Home

Calculate - Simple option

Calculate - Advanced option

Proactive Disclosure

Proactive Disclosure

SeedWhere - a climate similarity mapping tool

Advanced option

Use the following steps to generate a SeedWhere model.

NOTE: processing speed depends on the number of layers selected and extent of the area of interest. Be prepared to wait 10 seconds to several minutes.

1.a) Select a climate model/period for analysis.

NA normals 1971-2000

2011-2040 CGCM-a2

2011-2040 CGCM-b2

b) Select climate variables for analysis.

No set selected yet

2.a) Provide coordinates for location of interest

0,0 Longitude, Latitude (-89.3, 48.6)

b) Set area of interest

-by species core mask

Acer saccharum

Carya cordiformis

Chamaecyparis lawsoniana

-by little's range mask

Acer saccharum

Carya cordiformis

Chamaecyparis lawsoniana

-by rectangular region

Canada

AB

BC

-OR by coordinates

0,0,0,0 LLcorner, URcorner (-92,42,-75,51)

Apply

3. ☒ Colour output or ☐ grey output.

☐ Statistics output.

Climate Variable	Point value	Min value in AOI	Max value in AOI	Range
1. Annual Mean Temperature	13.00	-52.00	115.00	167.00
5. Max Temperature of Warmest Period	238.00	160.00	325.00	165.00
6. Min Temperature of Coldest Period	-239.00	-478.00	-53.00	425.00
12. Annual Precipitation	749.00	437.00	1369.00	932.00
18. Precipitation of Warmest Quarter	264.00	188.00	367.00	179.00
19. Precipitation of Coldest Quarter	120.00	39.00	333.00	294.00

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The functional trait approach

Isabelle Aubin



*A Canadian network
of plant functional
trait data*



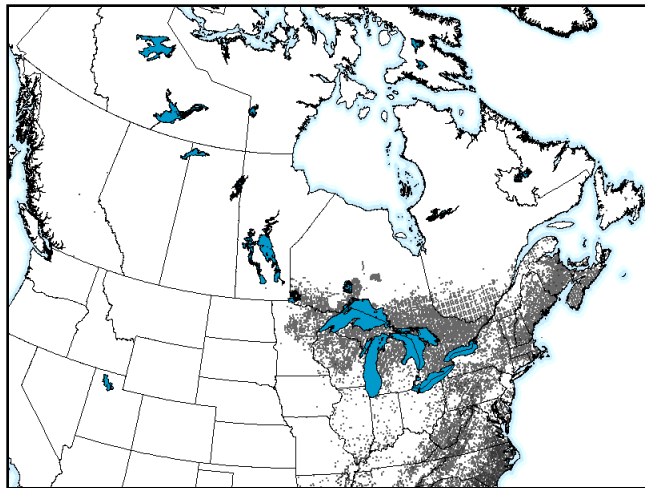
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The functional trait approach

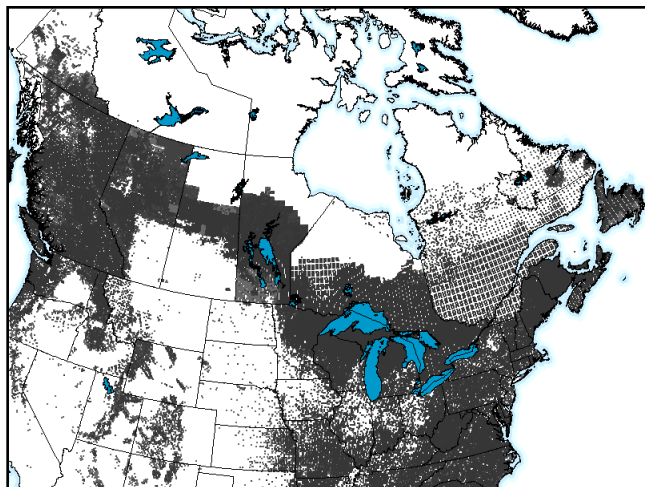
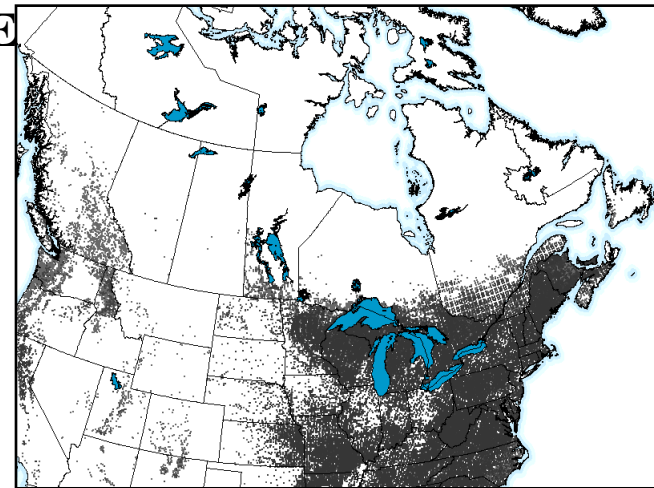
Isabelle Aubin



DROUGHT TOLERANCE

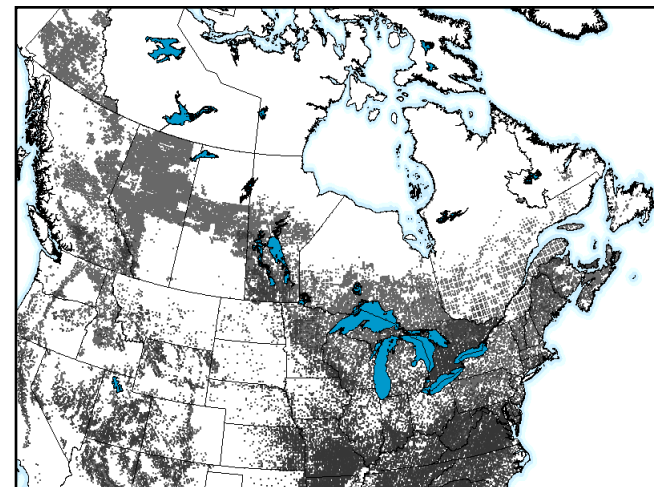
**No
tolerance**

**Medium
tolerance**



**Low
tolerance**

**High
tolerance**



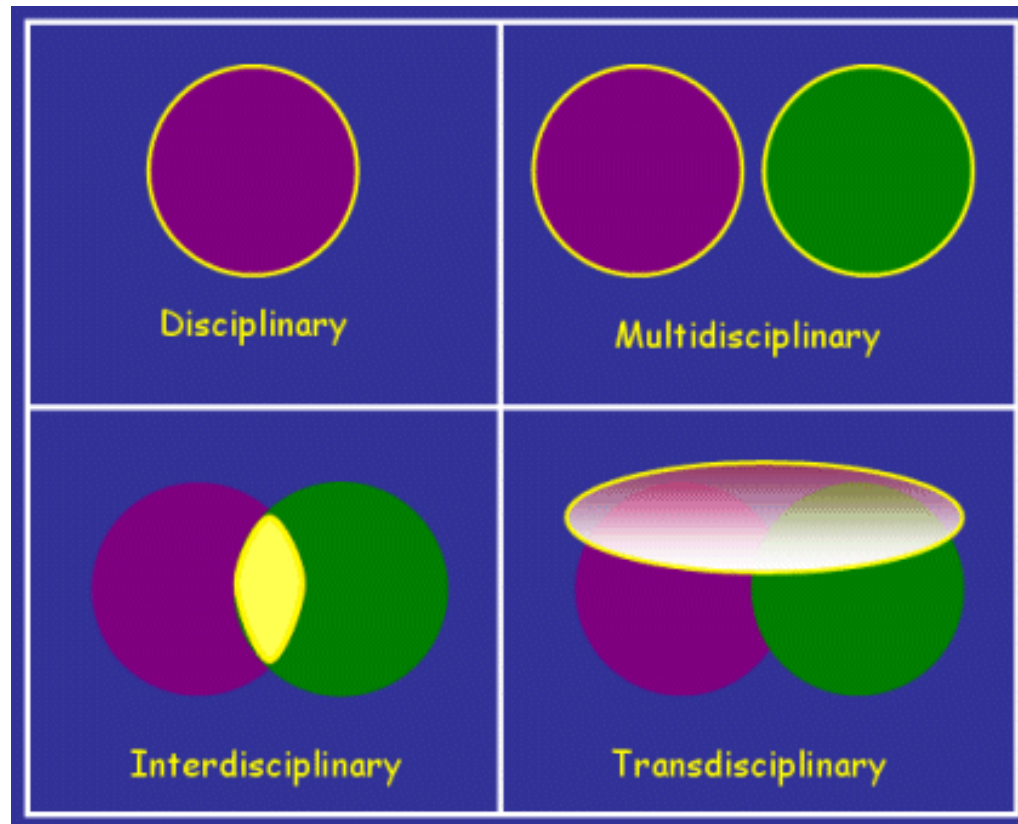
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Integrated assessment

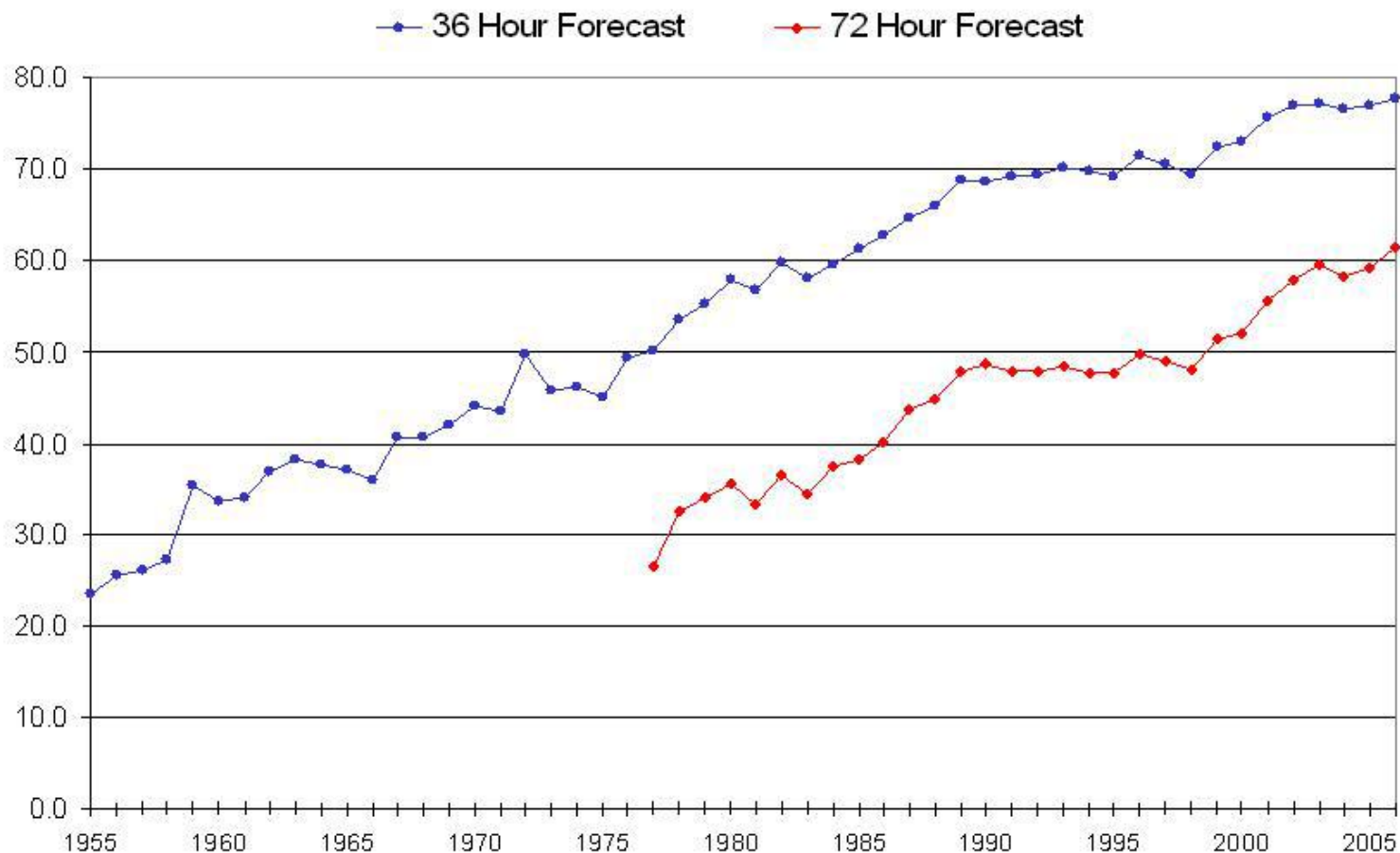
→ Working across multiple disciplines: combining socio-economic, practitioners, policy and scientific knowledge





NCEP Operational Forecast Skill

36 and 72 Hour Forecasts @ 500 MB over North America
[100 * (1-S1/70) Method]



Merci! Thank you!



"The future ain't what it used to be"

-Yogi Berra



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