FOREST CHANGE
Climate Change Impacts on Industry:
Sizing the Economic Risks.

Mark Boyland
Anne-Helene Mathey

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The question

How will climate change impact the Canadian forest industry?

- National in scope
- Time horizon up to the year 2100
- Focus on the bottom line of industry
Alternative approaches

1. Biophysical resource approach
   ▪ What happens to the forest?

2. Valuation of forest types
   ▪ Assigning $ for different forest types

3. Valuation of end product approach
   ▪ Assigning $ to the forest based on the end products

4. Value chain approach
   ▪ Following fibre through the processing to end products
Value chain approach

The challenge: **follow the climate signal**

- Tracing changes in climate from the forest through to end products.

A simple view
Value chain approach

- Management costs
- Cost profiles by fibre characteristics
- Mill location
- Mill capacity
- Climate
- Forest
- Fibre
- Processing
- Products
- Sustainable volume
- Quality class
- Product profile options
- Value curves by product profile options

A more complicated view
A more realistic view
A version that doesn’t hurt my brain

The project is a system of linked models:

- Climate
- Growth & Yield
- Disturbances
- Harvest
- Scheduling
- Industrial processing
Refining the science vs. creating actionable information

- High uncertainty - High impact
- High uncertainty - Low impact
- Low(er) uncertainty - Low(er) impact
- Low(er) uncertainty - High impact

- Fire – Larger area burned
- Weather – Extreme events
- Weather – Flooding
- Growth – Fibre Quality
- Growth – Species mix
- Growth – Yield
- Growth – Species mix
- Weather – Warming
- Weather – Drought
- Weather – Flooding
- Weather – Extreme events
- Pathogens
- Weather – Extreme events
Climate Change Impacts on Industry

The project is a system of linked models:

- Climate
- Growth & Yield
- Disturbances
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- Scheduling

Industrial processing
Value Chain Approach – methodology

1. Building the value chain network
Value Chain Approach – methodology

1. Building the value chain network
2. Allocating Canadian infrastructure to each nodes
   - Sawmills
   - Pulpmills
   - Pellet mills
   - Paper mills
   - OSB mills
   - Plywood mills
   - PB mills
   - MDF
Value Chain Approach – methodology

3. Building production function models (mill level)

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<th>To Section</th>
<th>Material</th>
<th>Volume</th>
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Value Chain Approach – methodology

1. Building the value chain network
2. Allocating Canadian infrastructure to each node
3. Building production function models (mill level)
4. Build material flow relationships (regional level)
   - From wood volume to tonne of pulp or board feet of lumber etc.
     → must include waste and by-products that are fed to other value chain nodes
   - Production costs in particular as they relate to raw material costs
     - By feedstock species (spruce, pine, aspen, etc.)
     - By feedstock type (raw logs, chips, sawdust etc..)
Value Chain Approach – methodology

1. Building the value chain network
2. Allocating Canadian infrastructure to each nodes
3. Building production function models (mill level)
4. Build material flow relationships (regional level)
5. Run the model!
We strategically limit the scope...

What we are doing:
- Figuring out how climate change will change fibre inputs:
  - Volume
  - Species mix
  - Fibre attributes
  - Cost
  - Location
- Figuring out how changes in fibre inputs influences industry:
  - Production
  - Location
  - Cost
  - Competitiveness

What we not doing:
- Examining competitor nations
- Projecting markets
- Predicting technological change
...to create interesting outputs

The types of statements we’re trying to get to:

- “By year X, the average hauling distance will increase/decrease by Y%, increasing/decreasing log costs by Z%”

- “By year X, the most economically attractive forest resources will not be in reach of current mill locations.”

- “By year X, the percentage of saw logs in an average stand will have increased/dropped by Y%, with a corresponding decrease/increase of pulp logs.”
Insights from the project

- Who is the target audience for your research?
  - Other scientists?
  - Decision makers?
  - Industry?

- What information would be most impactful to them?
  - Not always obvious.

- Use one model to do good science work. Use many linked models to do useful policy work.
Insights from the project

- Scientific rigour
- Real world applicability

- Scientists
- Other people

Everyone in this room
Canadian forest sector analyses & commentary

- Transformation
- Economics
- Competitiveness

Selective Cuttings

cfs.nrcan.gc.ca/selective-cuttings