Downscaling of Long-Term Global Scenarios to Regions with a Forest Sector Model

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Overview

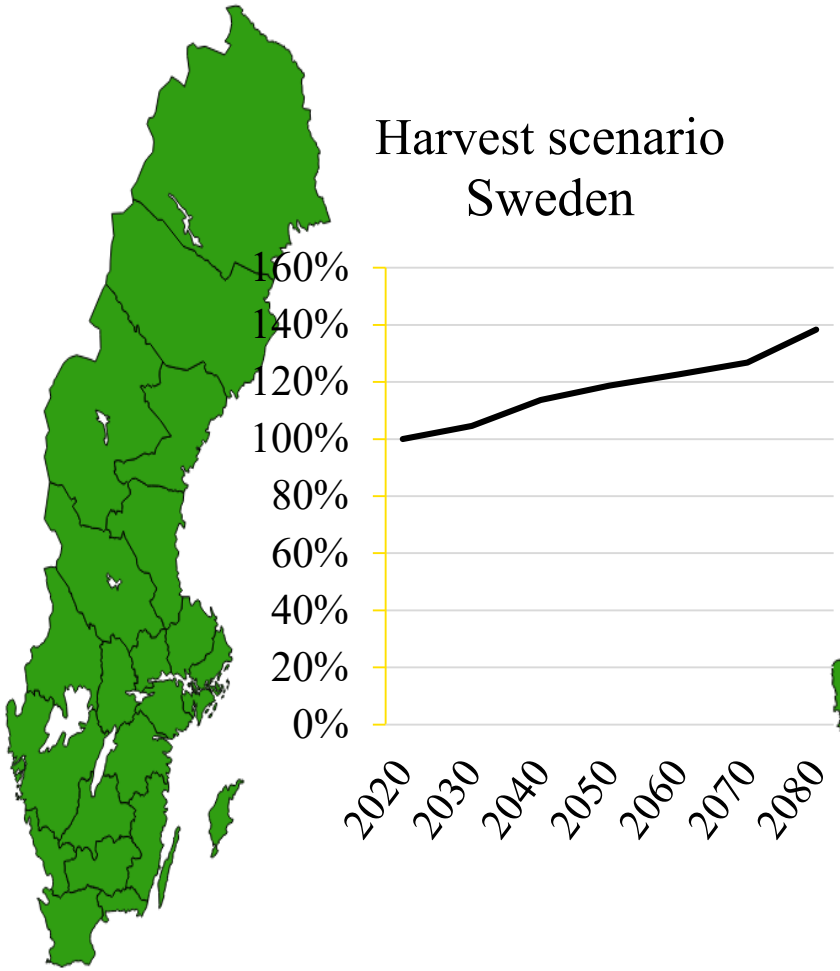
1. **Model**:
   - Forest sector model →
     forest → sawmills + heating plants + pulp mills →products markets
   - Long range (50-100 years)
   - Linear programming
   - Limitations: model size (transports!)
2. **Data**: a) National Forest Inventory data; b) individual plant data
3. **Implementation**: 0.4 mill € (5 researchers) – 10 mill € (30 researchers)
4. **Availability**:
   - Forest projection system – **Heureka** – open source ← **SLU**
   - Industrial part – **SweFor** – open source? ← **Linnéus Univ.**

The next slides:
- Example of use
- Climate change

What's the problem?

1. You have scenario results (e.g. total harvest volumes) on **national** level.
2. You are interested in analysing a **landscape** under the scenario.
3. E.g. what harvest level should be applied to the landscape under a specific scenario?

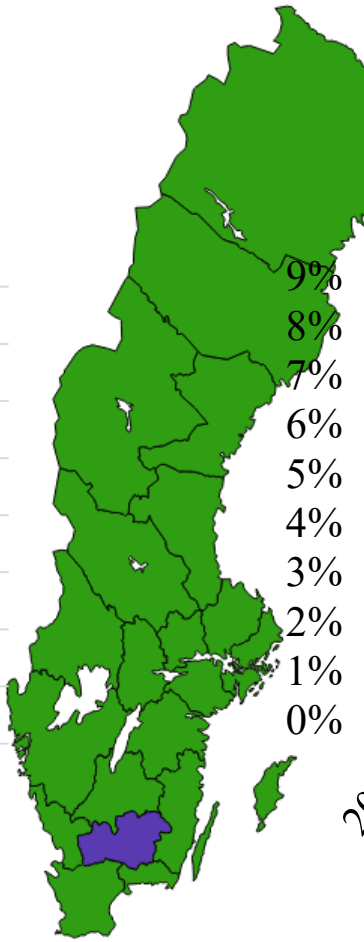
The PROBLEM: National level → local level



Harvest scenario
Sweden

160%
140%
120%
100%
80%
60%
40%
20%
0%

2020 2030 2040 2050 2060 2070 2080

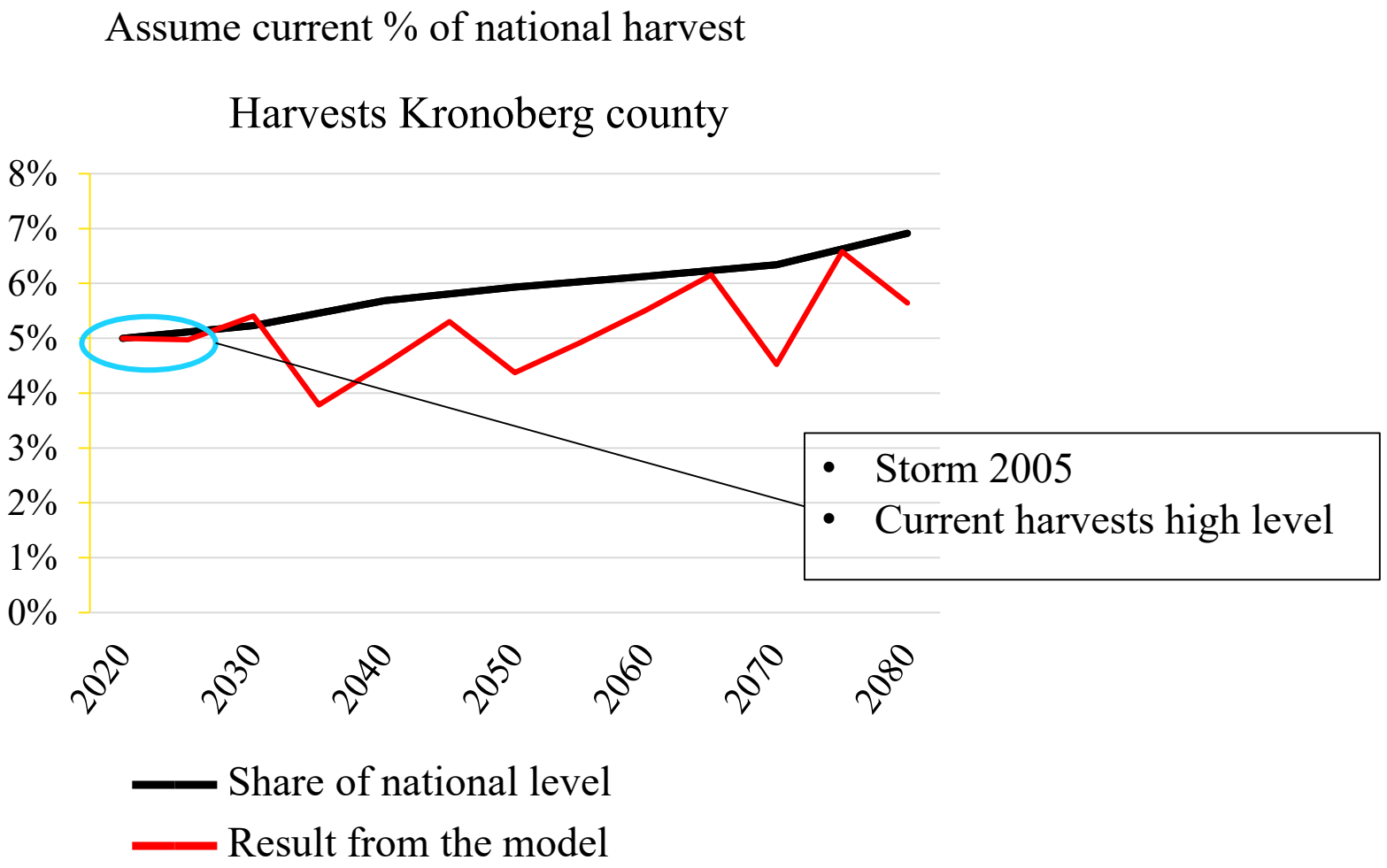


Scenario harvest region?

9%
8%
7%
6%
5%
4%
3%
2%
1%
0%

2020 2030 2040 2050 2060 2070 2080

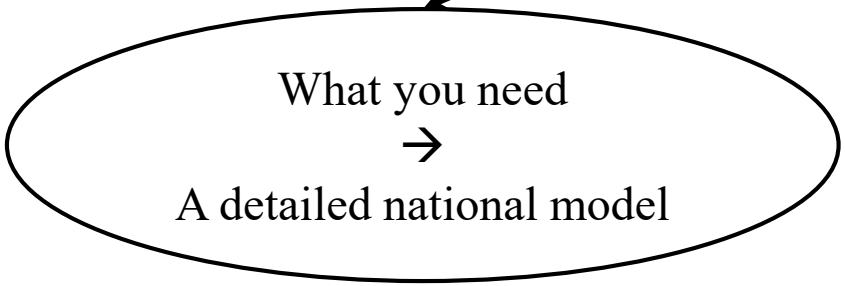
Example Kronoberg county



Two methods National level→ Regional level

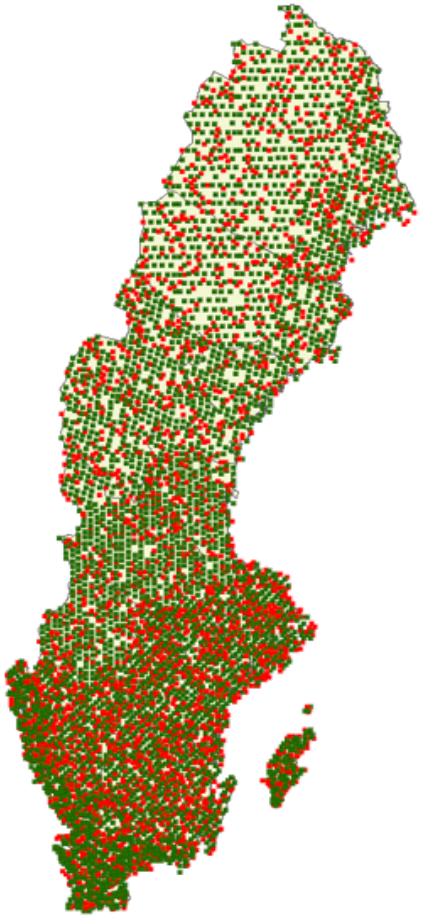
Method 1: Apply the same relative share in region

Method 2: Distribute the national scenario volume according to the conditions of the regions

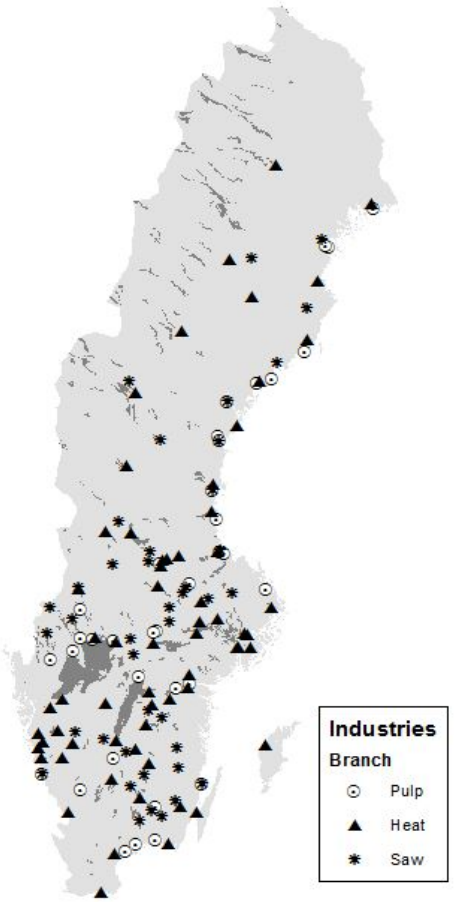


SweFor – a forest sector model

NFI plots

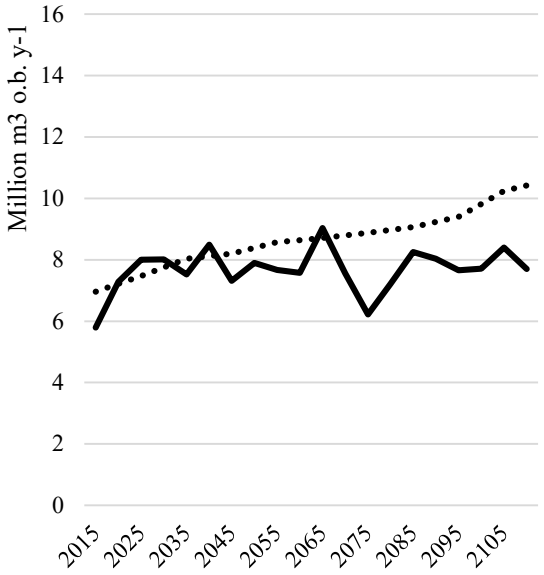


Pulpmills, saw mills, heating plants

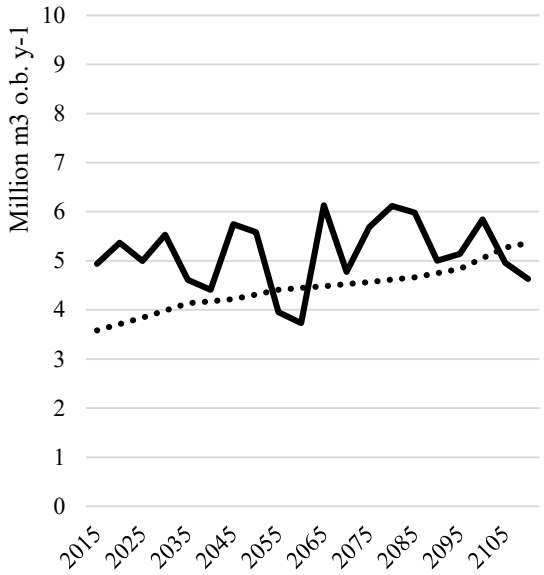


SweFor results for two regions

Northern region



Southern region



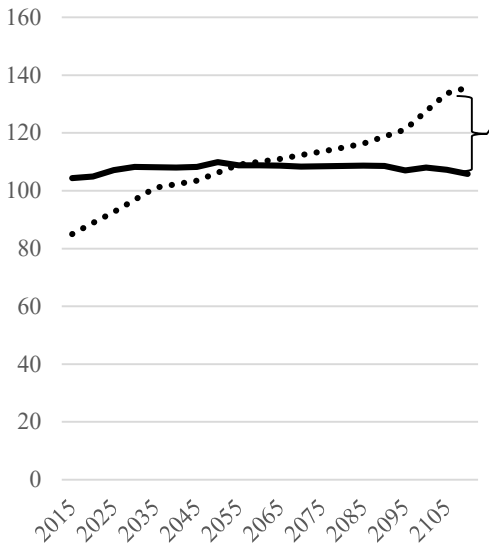
····· Share of national level

——— From SweFor sector model

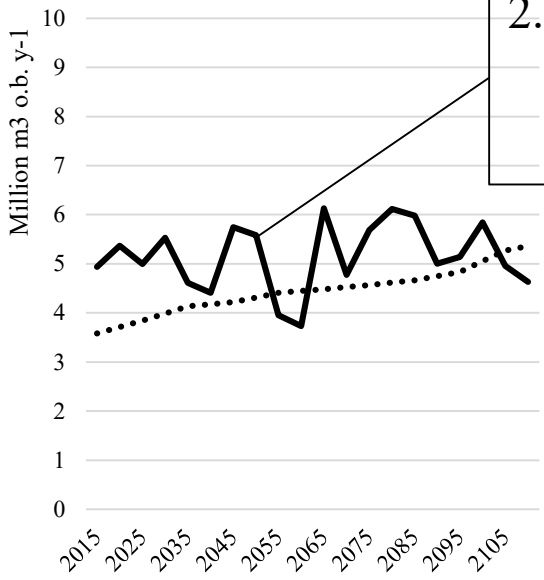
Problems

1. The sector model gives other results than predicted by the global model

Sweden



Southern region



2. Regional results: could vary period by period

····· Scenario harvest volume

——— From SweFor sector model

····· Share of national level

——— From SweFor sector model

Climate change

Forest projection system (**Heureka**):

Thank you!

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