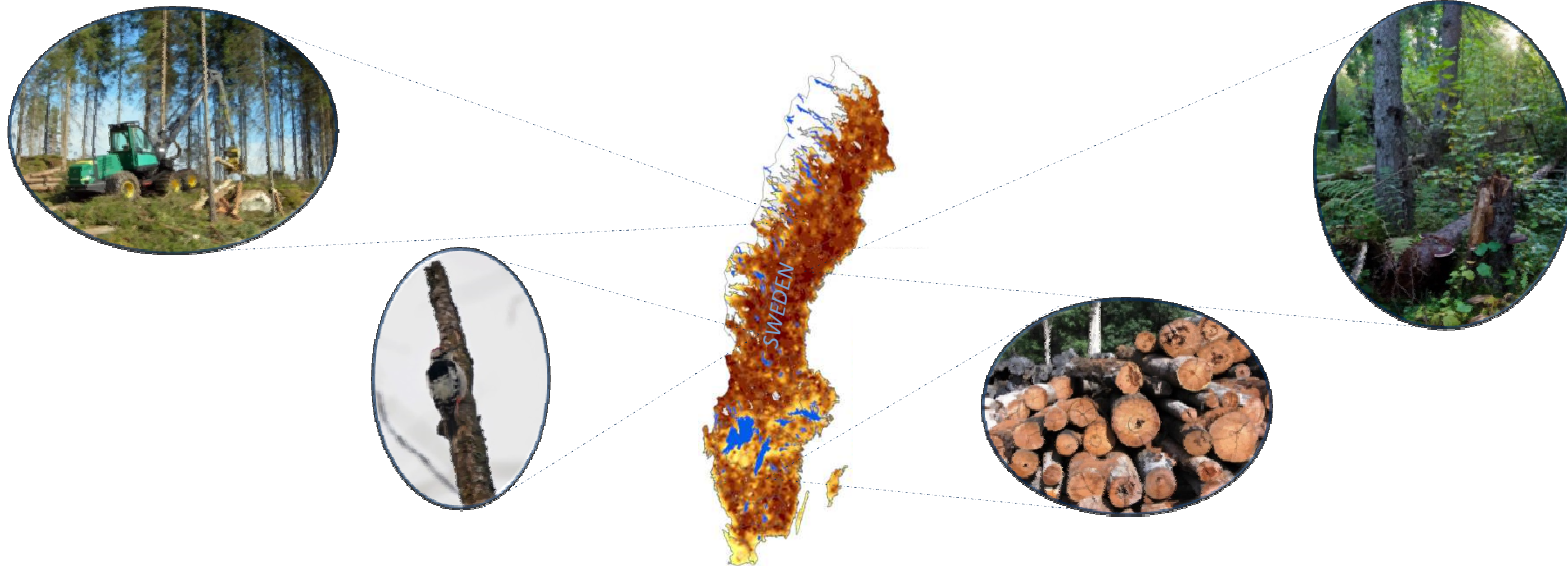


How can multi-agent models provide lessons on the process of change of practices?

An example from Sweden



Victor Blanco

Research Associate

Institute of Geography and the Lived Environment

School of GeoSciences

University of Edinburgh

& Mark Rounsevell, Calum Brown, Sascha Holzhauser,
Gregor Vulturius, Fredrik Lagergren, Mats Lindeskog



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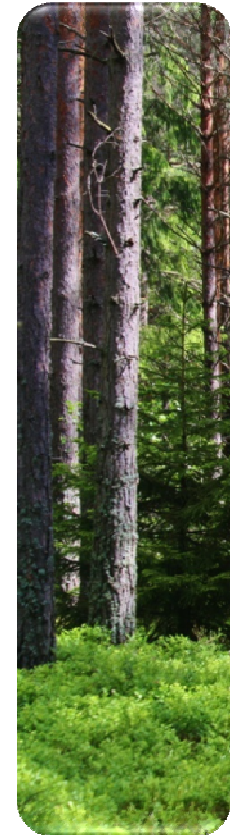


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Research Questions



1. How might global change influence future **land use** change and **ecosystem service** provision in Sweden?
2. How can the forestry sector **adapt** to environmental change in meeting future demands for ecosystem services in Sweden?



Agent-Based Models (ABMs)



- **'Bottom-up'** models
- **Agents**

Interact

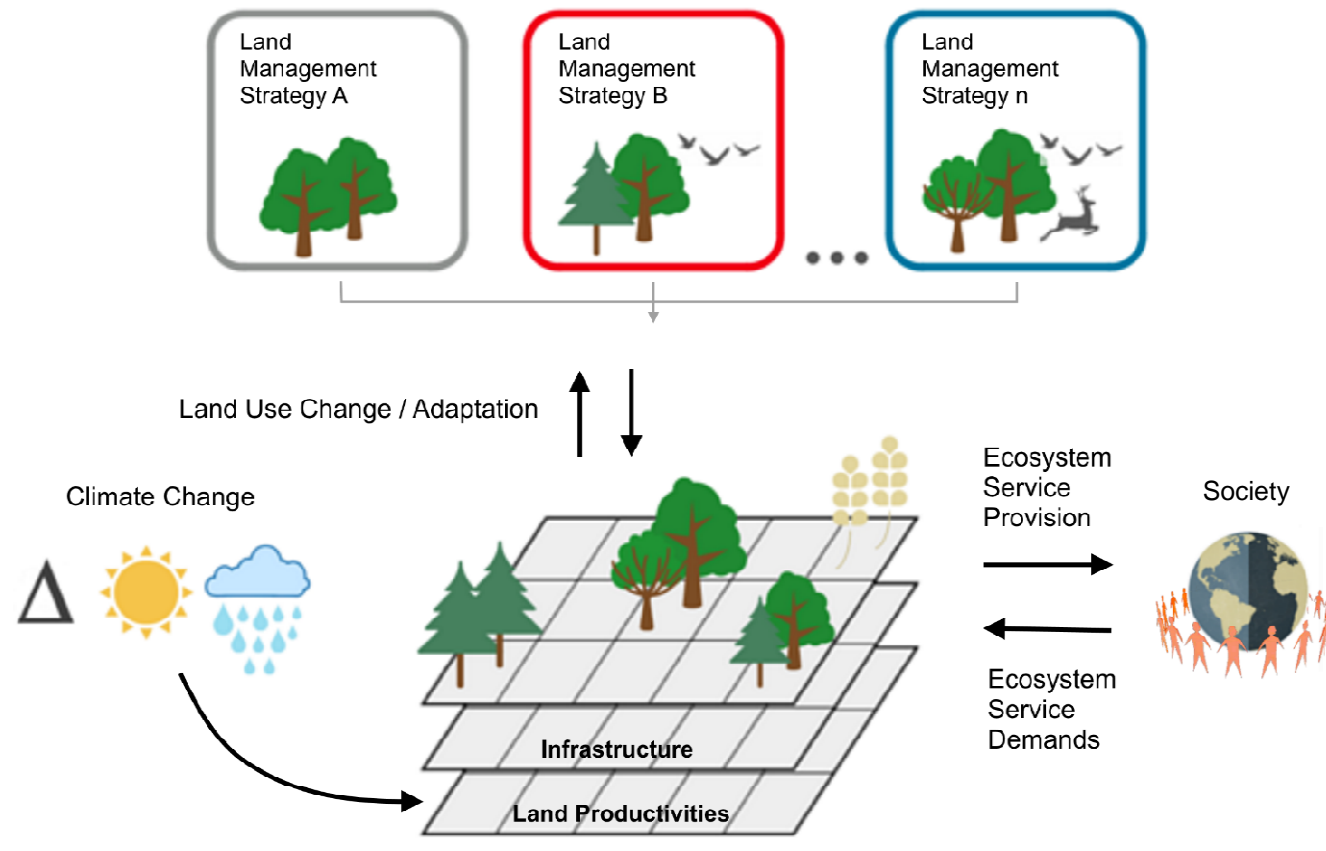


Make decisions

- **Land-use context**
 - Land Managers/ Owners
 - Landscape



Modelling Adaptation to Global Change



CRAFTY-Sweden Model



Mapping Land Owner Types (2010)



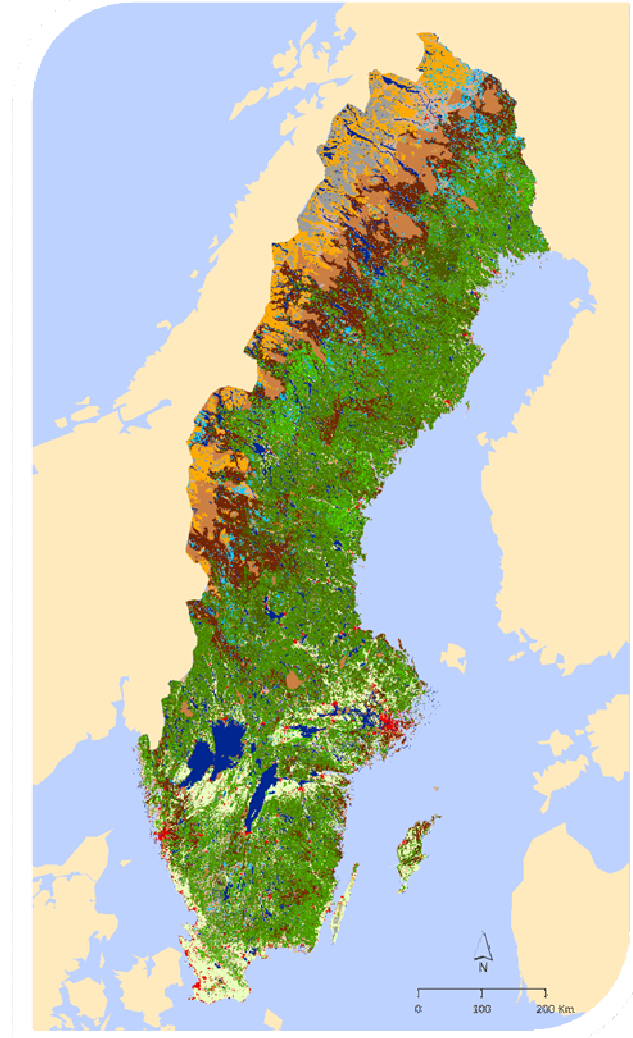
Land Use

- Pine
- Spruce
- Boreal Broadleaf
- Nemoral Broadleaf
- Pine – Spruce
- Pine – Boreal Broadleaf (≥30%)
- Pine – Boreal Broadleaf (<30%)
- Spruce – Boreal Broadleaf (≥30%)
- Spruce – Boreal Broadleaf (<30%)

- Artificial Surface
- Agriculture
- Protected Area
- Non-productive Forest
- Semi-natural Vegetation
- Open Space
- Wetland
- Water Body
- Unmanaged

Land Owner Types

- Productionist Pine
- Productionist Spruce
- Productionist Pine – Spruce
- Productionist Boreal Br.
- Multi-objective Pine – Spruce
- Multi-objective Pine – Boreal Br.
- Multi-objective Spruce – Boreal Br.
- Multi-objective Boreal Br.
- Recreationalist Pine – Spruce
- Recreationalist Boreal Br.
- Recreationalist Nemoral Br.
- Conservationist Boreal Br.
- Conservationist Nemoral Br.
- Passive Pine – Boreal Br.
- Passive Spruce – Boreal Br.
- Passive Boreal Br.
- Passive Nemoral Br.
- Unavailable
- Farmer (Commer/Non-commer + Cereal/Meat)
- Unavailable
- Unavailable
- Unmanaged
- Unavailable
- Unmanaged
- Unavailable
- Unmanaged

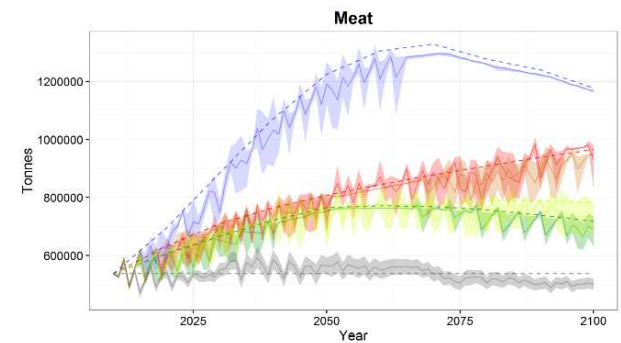
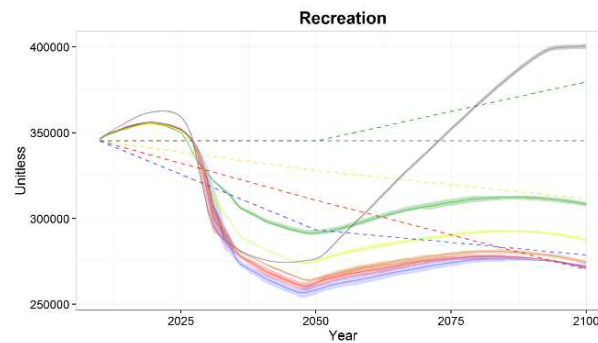
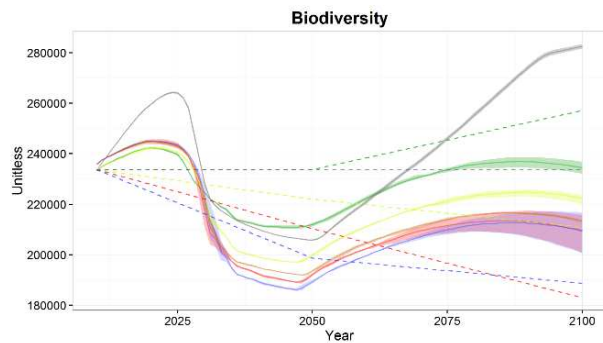
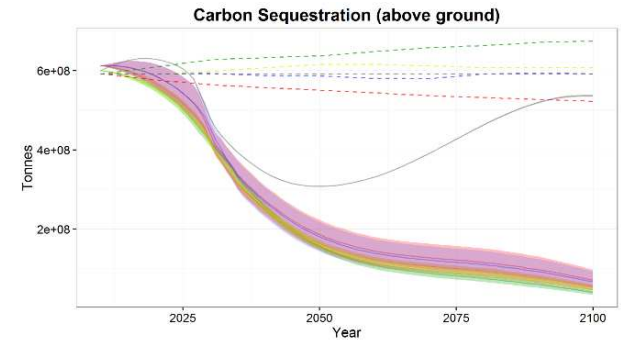
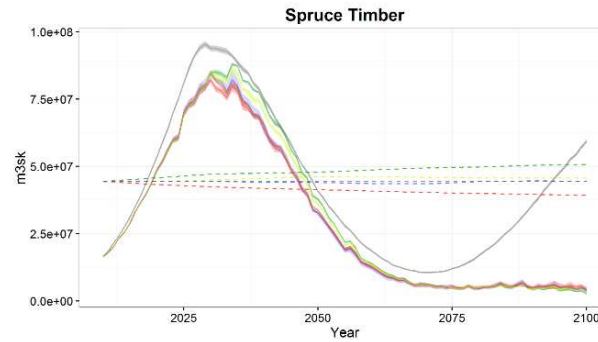
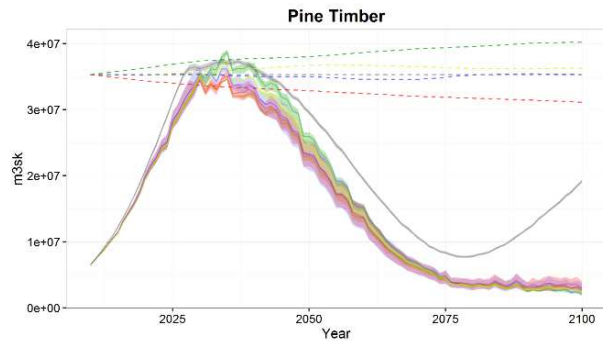


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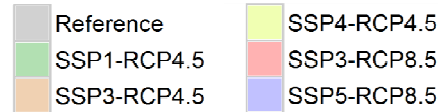


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Ecosystem Service Provision (2010-2100)



Scenarios

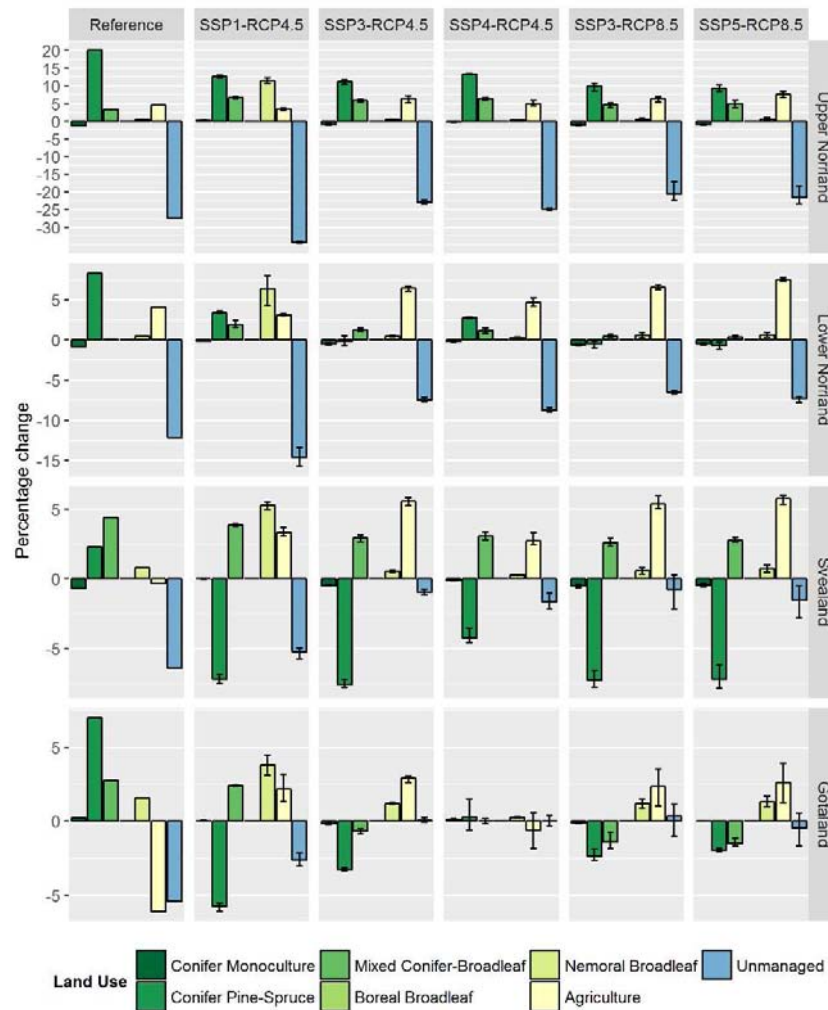


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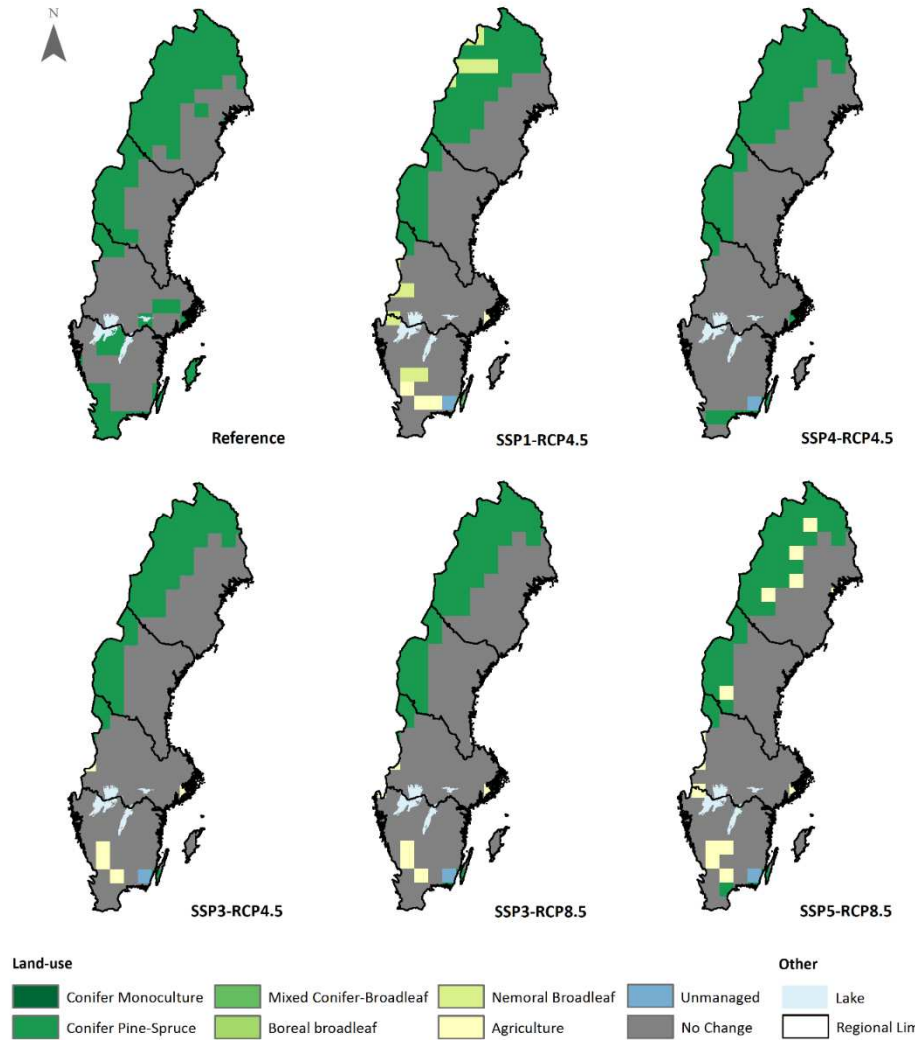


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Regional land-use changes (2010-2100)



Hotspots of land-use change (2010-2100)

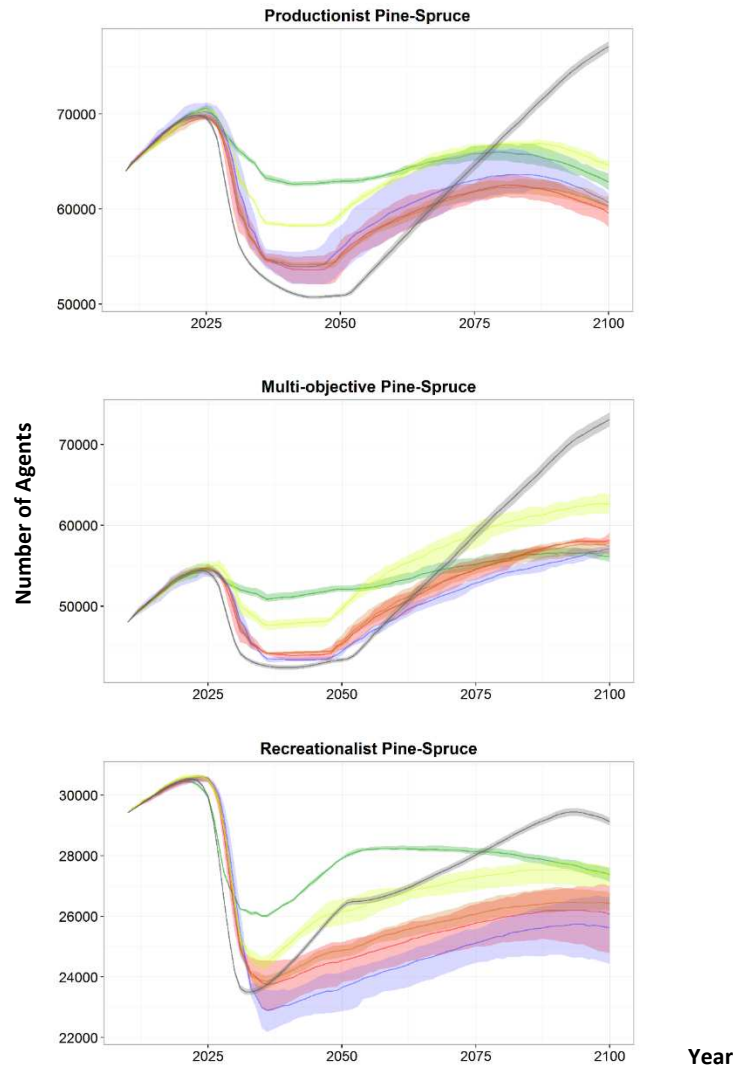


Hotspot:

>10% of the land converted to a particular land-use class



Competitiveness of Forest Owner Types



Coping Ability of Forest Owner Types

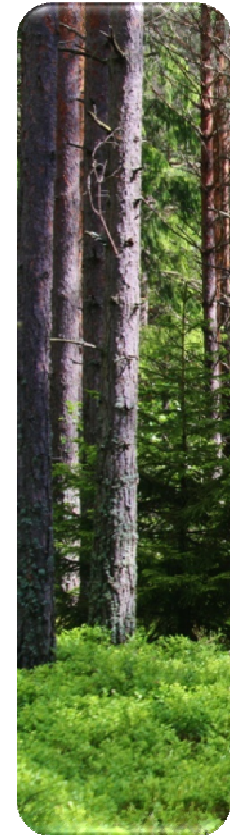


Summing Up



Drivers of Adaptation

- **Legacy effects** of past land-use change
- Processes of **competition** for land
- **Societal demands** for ecosystem services
- **Climate change**
- Land owner **behaviour/ decision-making**

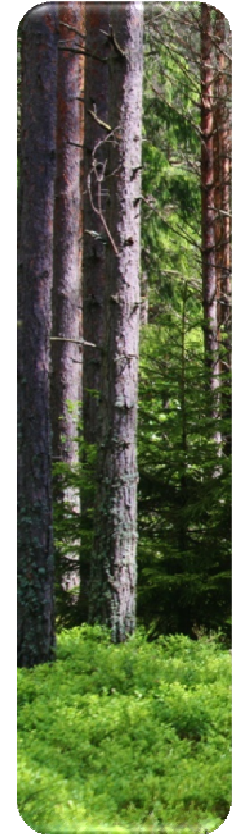




3 reasons why you should start using... ...agent-based models

They can simulate:

- Processes (vs. states)
- Future trajectories
- Context/ Interactions





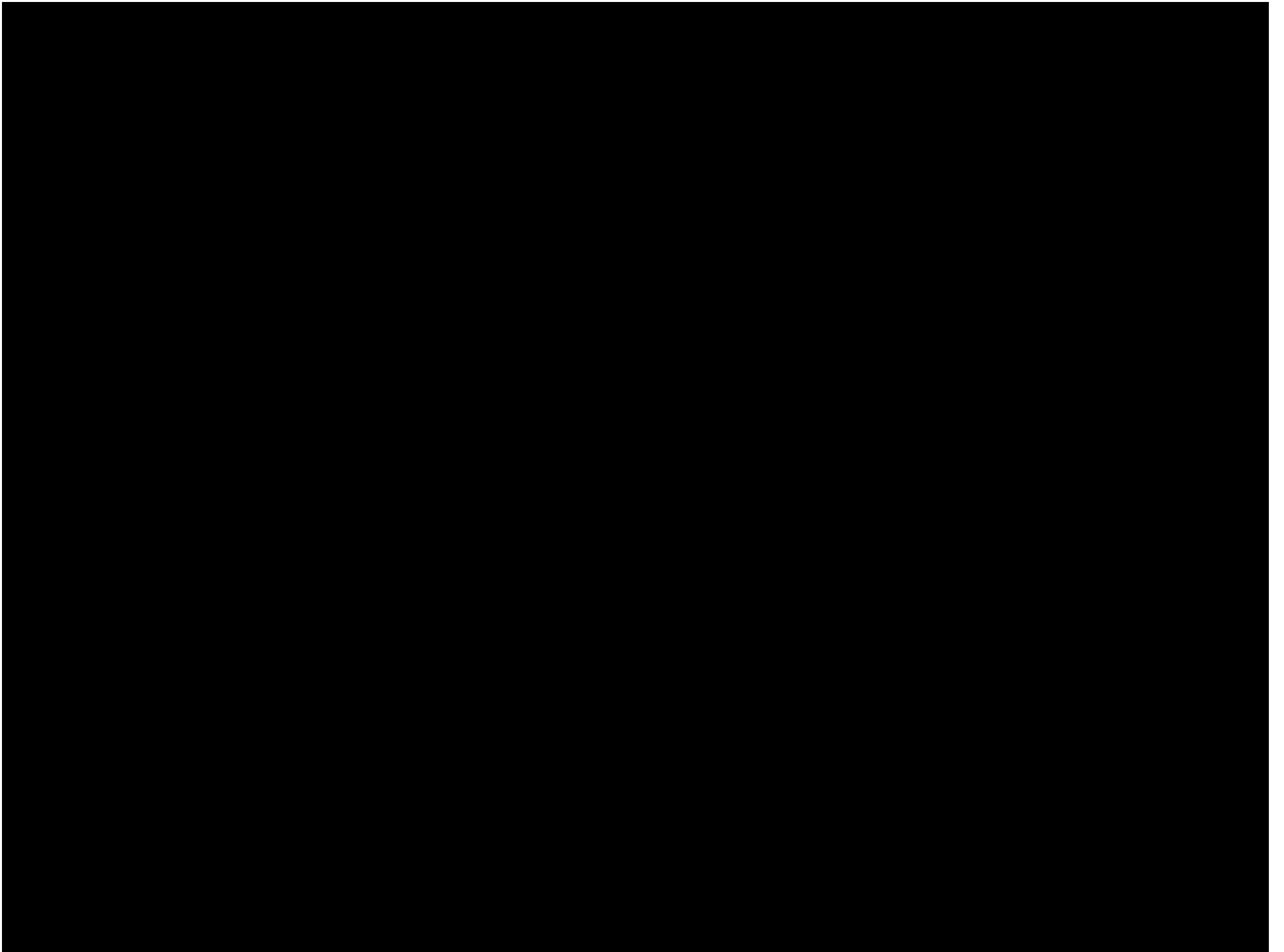
Thank you



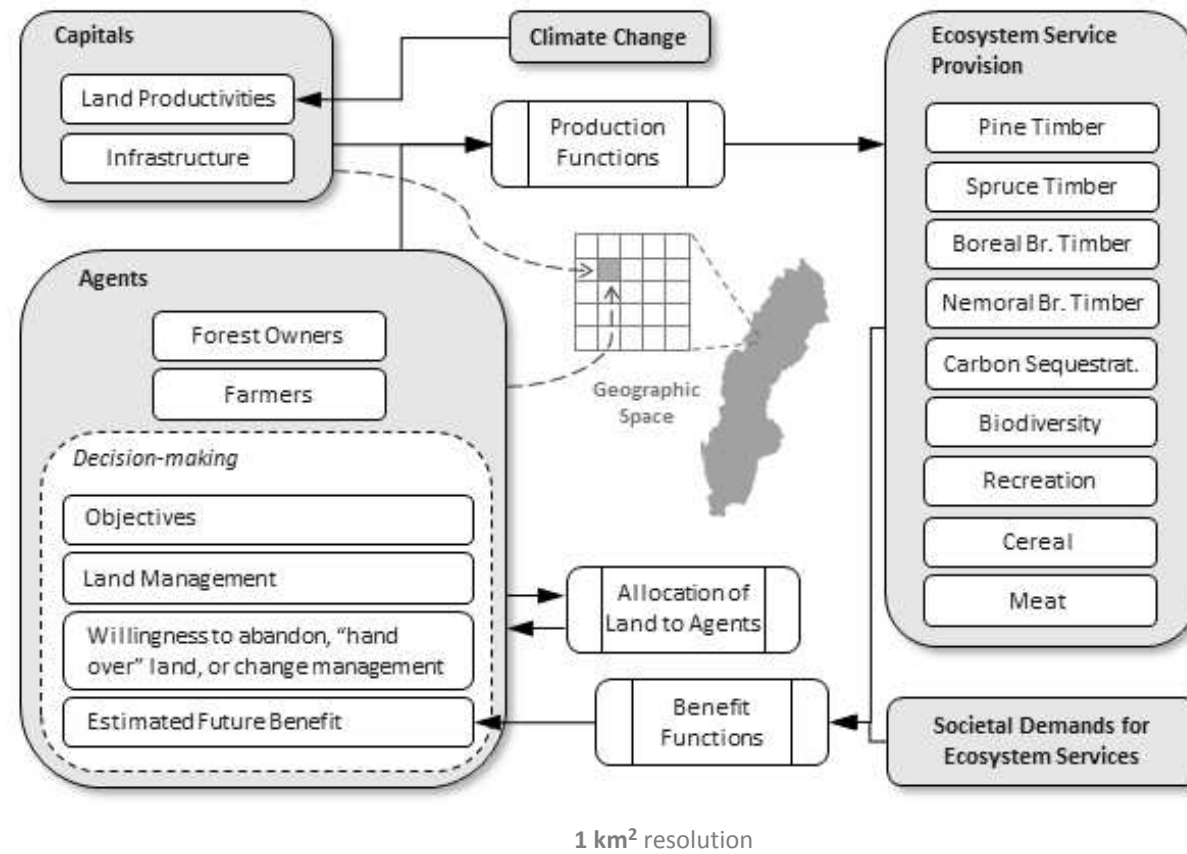
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Modelling Adaptation to Global Change



CRAFTY-Sweden Model



Forest Owner Functional Types

