Can collaborative governance help reduce forestry impact on water quality? A study in north Sweden

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Impacts on water from forestry

- Forest-covered areas (2/3 of land area) are one of the largest sources of contaminants and nutrients reaching the Baltic Sea from Sweden
- Physical impacts (restoration of dams and fish migration from timber floating, forest drainage)
- Sediments and leaching from deep tracks
- Riparian vegetation, buffer zones
- Flooding
- Acidification, nutrient leaching/eutrophication from harvesting

Water management policy

- Long standing water management – traditionally an issue for each sector; municipalities responsible for drinking water; *expert-driven, little local involvement*
- 16 Swedish National Environmental Quality Objectives introduced *sector responsibility*
- New Water Authority established in 2004; five Water Districts in Sweden; included in the County Administrations
- EU Water Framework Directive (WFD) demands catchment collaboration in Water Councils as well as among economic sectors (forestry, agriculture, energy etc.)

Overall aim and research questions:

Which mechanisms can render collaborative forest-water governance most effective?

- moving beyond the much investigated procedural aspects of collaborative governance to specifically evaluate its influences on forest-water quality

(a) Political science component: collaborative governance in forest policy and practice

(b) Hydrology/biogeochemistry component: factors influencing forest water quality
Krycklan Research Catchment
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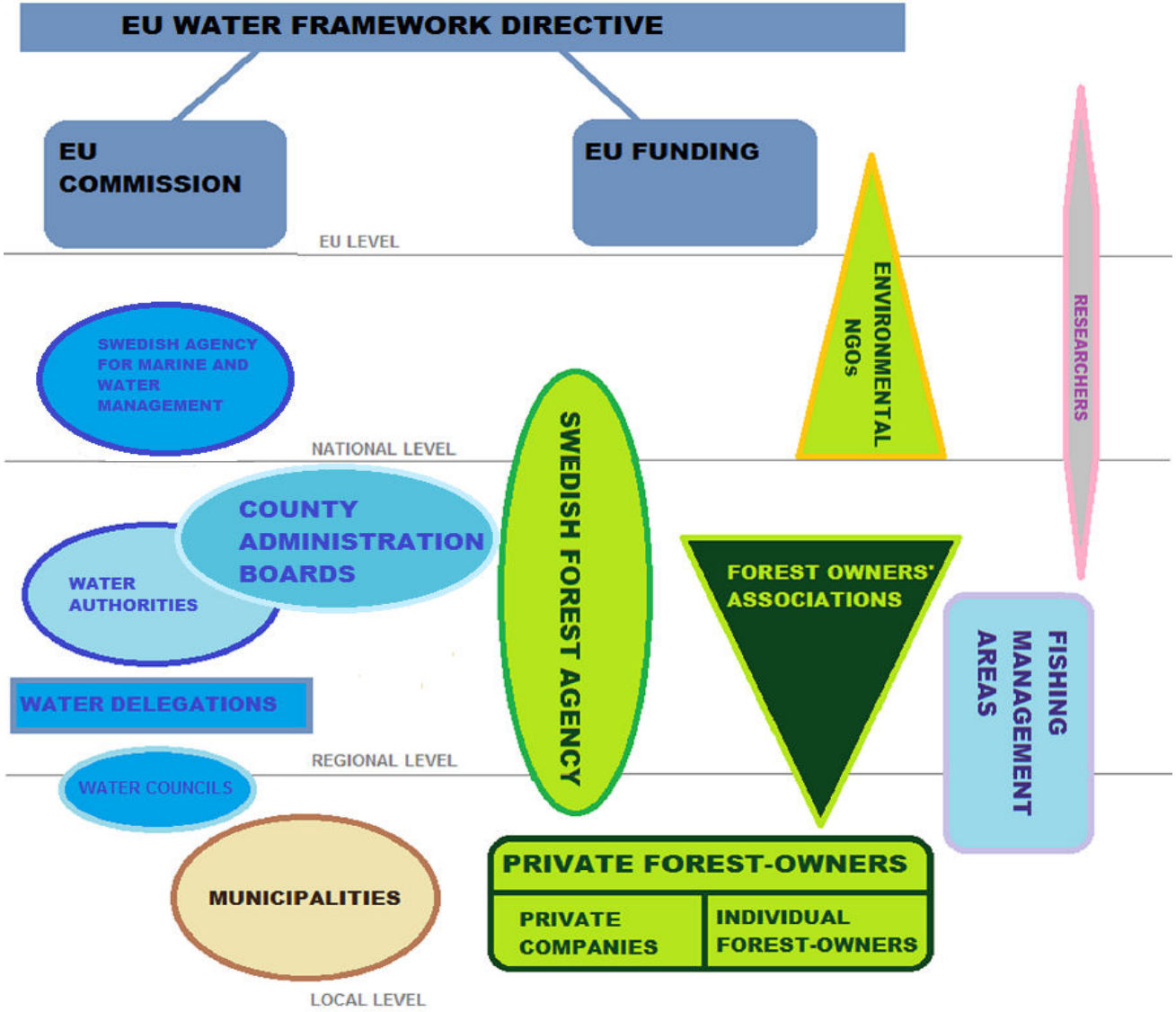
Why engage the forest sector in the implementation of the WFD?

- Broad participation required by the WFD;
  The Forest Agency, in consultation with the Agency for Marine and Water Management, should develop guidance and policy instruments for protective riparian zoning in order to achieve good chemical status and good ecological status.
- The Forest Agency has developed ”goal images” for (environment and) water protection during the last few years in dialogue with private forest companies, The Forest Owners’ Association and environmental interest groups

Mapping of forest water governance and its impact

- Has the emphasis on collaborative governance in the WFD implied any change in how the forest sector works with water issues, and if so, how?
- Which factors impact on the inclination of forest actors to collaborate and take action on improving the status of forest waters?
- Which new strategies for water collaboration and/or specific collaborative projects have been created?
- Which measures are taken by whom, where and when? What results are perceived by the various actors?
- How effective are those measures for reducing nutrient leaching and contamination of different types of water bodies?

Actors in forest water governance



Why collaborate?

To improve the water situation

- Complex problems, joint solutions
- Foster awareness and engagement
- Devolve responsibilities
- Bring in local knowledge and experience
- Mobilize new funding/investments
- Anchor decisions in local realities
- Provide new ideas and initiatives
- Create more effective solutions
- Conflict resolution over competing goals

Conditions for collaboration

- Shared problem perception; acute need to act
- Arenas for deliberation
- Inclusiveness: all relevant interests and actors
- Clear roles and responsibilities
- Trust/accountability
- Procedural and output legitimacy
- Resources for process facilitation, leadership and communication
- Knowledge about potential solutions
- Mechanisms for conflict resolution
- Leadership and enthusiastic ”firebrands”

Current collaborative management over forest-water

National level

- the Forest-Nature Protection Policy Dialogue
- National Forest Agency 'goal images' in consultation with forest and nature protection interests

Regional level

- the Vindel-Uman River Water Council
- the Vindel-Uman Fishing Management Association
- the Vindel Life Project (EU-funded)
- Information/education campaigns by the County Administration together with the forests sector
- RemiBar to restore water passage under roads

Local level (Vindel catchment area)

- 40+ Fishing Management Groups (5000+ individual fishing right owners) and Common Property Societies (forest roads etc)
- Large number of funded water restoration projects

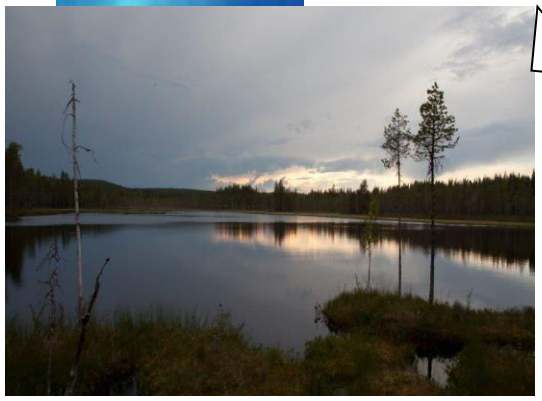
The Vindel River: a large-scale regional water catchment restoration

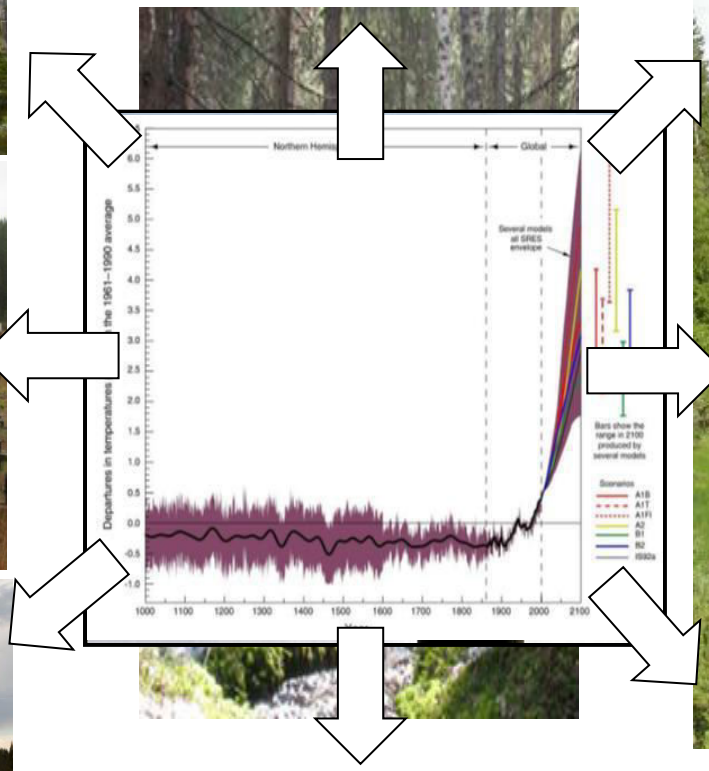
- emerged in the 1970s as compensation for protection of the river from hydropower exploitation
- to promote tourism, but increasingly to remove remnants from timber floating practices
- restoration activities now concern both the water body and the catchment area, including forest land

A collaboration between the County Administration, the Forest Agency, municipalities, The Forest Owners' Association, state/private forest companies and environmental organizations

Hydrology/biochemistry

A landscape perspective on aquatic processes

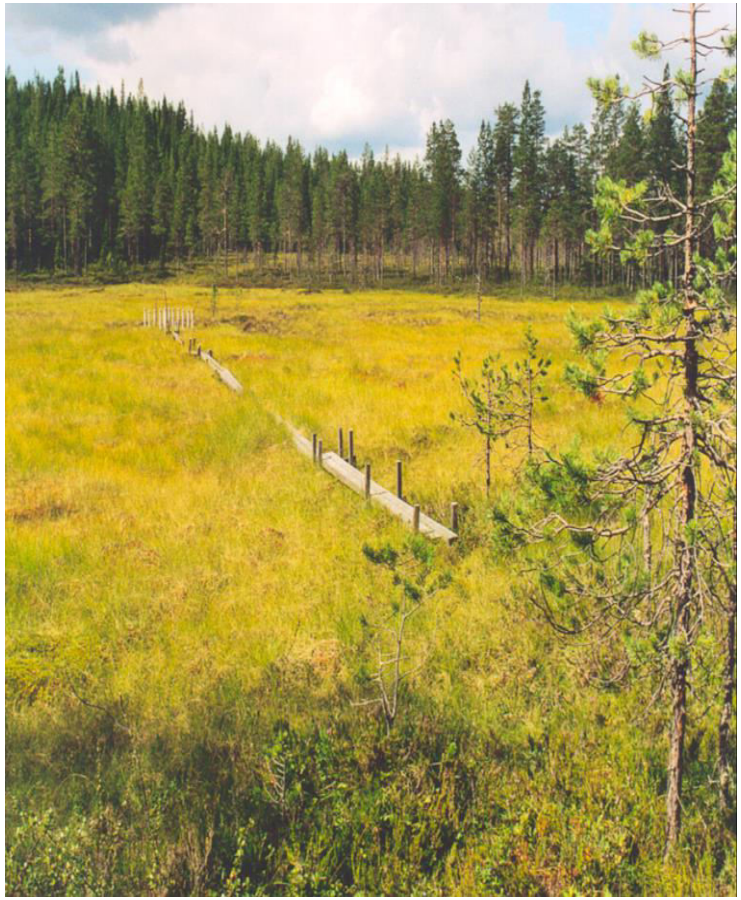




The boreal landscape mosaic

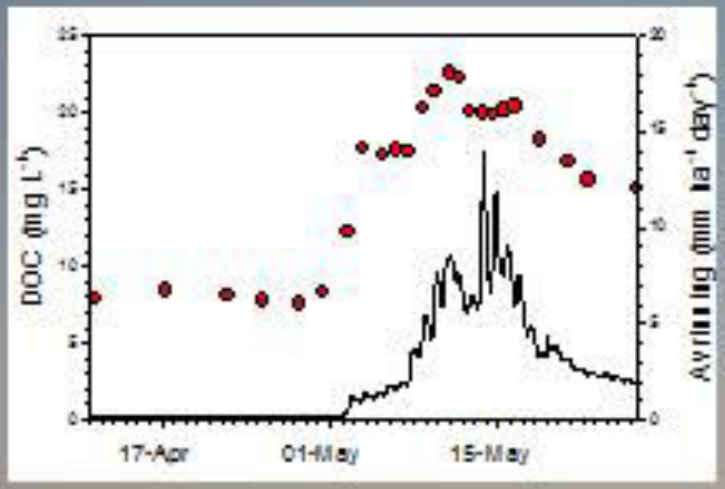
Forest ~75%

Wetlands ~25%

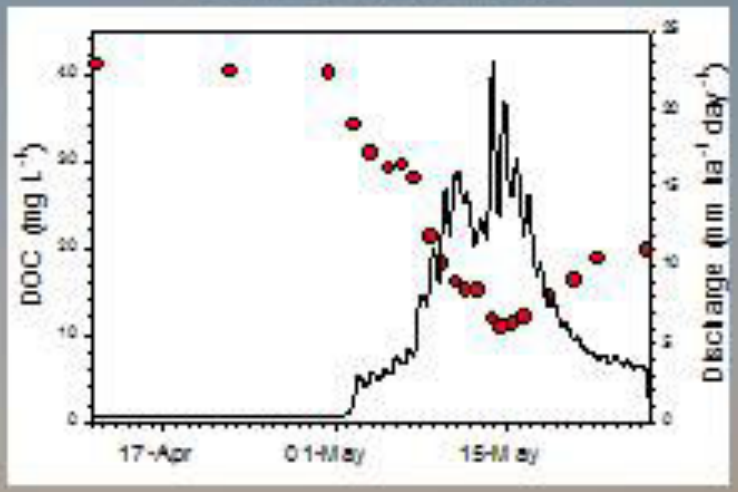


DOC dynamics

Forested catchment



Wetland catchment



Laudon et al. 2004

DOC – *Function*

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acid-b aminants

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Assessing impacts from specific measures

Local

- resulting from forest owner collaboration in the Krycklan catchment area

Regional

- resulting from collaborative management efforts in the Vindel River basin initiated by:
  - Water Council
  - Fishing Management Association
  - Vindel Life Project

National

Possibly discuss impacts of prioritizations in forest water management


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