Implementation of Water Framework and Flood Directive in Finland

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Finland is rich in freshwater

- About 11% of surface is covered by water
- The number of lakes larger than 1 hectares (10 000 m²) is 56 000

![Map showing land surface area covered by water](image)
Water resources
Groundwater

- Total number of classified groundwater areas: 6 200
- Total water yield: 5.8 Mm³/day
- The aquifers in Finland’s glacial deposits rank in quality among the best reserves of groundwater in the world
- Groundwater resources are protected through special plans
Water services / Drinking Water

- Approximately 90 percent of the Finnish population were served by municipal waterworks
  - Near 60% percent of the served water is groundwater

- Over 300,000 inhabitants in sparsely populated areas in Finland live outside the public waterworks
Wastewater treatment

Wastewater treatment in urban areas account for 80 percent of the population
- All urban and industrial wastewater is treated
- 95 percent reduction of organic matter,
- 95 percent reduction of phosphorus,
- 55 percent reduction of nitrogen

There are still challenges in removal percentages and treatment in rural areas
Nutrient load: phosphorus 1/2

The total point load of phosphorus (kg/yr) in 2005:
- ≤ 100
- 100 - 499
- 500 - 999
- 1,000 - 1,999
- 2,000 - 3,999
- > 4,000

Diffuse load of phosphorus:
- < 5 kg/ha - lähinnä vertailuvoja
- 6 - 10 kg/ha - vähäinen hajakuormitus
- 10 - 20 kg/ha - keskisennäinen hajakuormitus
- 20 - 40 kg/ha - suurehko hajakuormitus
- > 40 kg/ha - vahva hajakuormitus
Number of water bodies and monitoring stations

<table>
<thead>
<tr>
<th>Surface water category</th>
<th>WFD 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>sites</td>
</tr>
<tr>
<td>Lakes</td>
<td>787</td>
</tr>
<tr>
<td>Rivers</td>
<td>433</td>
</tr>
<tr>
<td>Coastal</td>
<td>127</td>
</tr>
<tr>
<td>Total</td>
<td>1347</td>
</tr>
</tbody>
</table>

Surveillance monitoring

Operational monitoring

Both
Ecological status of surface waters

by proportion of total length (rivers) or surface area

<table>
<thead>
<tr>
<th>Ecological status</th>
<th>Rivers</th>
<th>Lakes</th>
<th>Coastal waters</th>
</tr>
</thead>
<tbody>
<tr>
<td>High or Good</td>
<td>52%</td>
<td>87%</td>
<td>36%</td>
</tr>
<tr>
<td>Moderate, Poor or Bad</td>
<td>48%</td>
<td>13%</td>
<td>64%</td>
</tr>
</tbody>
</table>

Source: Regional Environment Centres and Finnish Environment Institute © SYKE
Water policy instruments

- Planning and long term target setting
  - National water protection programmes
  - River Basin Management Plans
- Legislation and enforcement
- Economic Instruments
  - Agri-environment subsidy
  - Water and waste water charges
- Information, education and research
- Financing
  - Rehabilitation of water bodies
  - Construction of wastewater and water supply networks
- International co operation
  - Baltic Sea co operation, transboundary waters, other activities
  - Financing water protection in the neighbouring areas
River Basin Districts (RBD) in Finland

- 5 national, 2 international and 1 independent

Joint Border Water Commissions with Sweden, Norway and Russia
Triangle of planning process

- Implementation of measures
- Programme of measures
- Setting objectives
- Monitoring
- Characterisation, pressure and impact and economic analysis
- Transposition, RBD delineation, competent authorities, administrative set-up, coordination arrangements
Result: measures are needed in all the sectors

- Reducing the agricultural loads is the biggest challenge
- Reducing loads of Domestic Wastewater in Areas Outside Sewerage Networks (updated Decree 20011)
- Reducing the harmful impacts of hydrological engineering and water-level regulation
- Measures with acid sulphate soils
- Water body restoration
- Reducing the loads from forestry
- Protecting groundwater
Implementation of measures

- Ministry of the Environment coordinated preparation of the national action program for the implementation of the policy instruments of RBMPs
  - Approved by Council of State Feb 17th 2011

- Regional authorities (ELY-centres) agreed with regional cooperation groups about timetable and financing of regional measures until September 2011
Implementing the Floods Directive in Finland
New Legislation for Flood Risk Management in Finland

- Entered into force in July 2010
- Includes implementation of the EU’s Floods Directive in Finland
- Defines the responsibilities of different authorities in flood risk management:
  - The local Centres for Economic Development, Transport and the Environment are responsible for the flood risk management for fluvial floods (river and lake floods) and sea floods
  - The local municipalities are responsible for the flood risk management for pluvial floods (local floods caused by heavy rainfall)
  - The Ministry of Agriculture and Forestry is coordinating the flood risk management in Finland
Three main steps

- **Preliminary flood risk assessment** (maps, experience from past floods, predictions of future floods, identification areas of potential significant flood risk), *DL 2011*

- **Flood mapping** (for the areas of potential significant flood risk, different scenarios, flood hazard maps & flood risk maps), *DL 2013*

- **Flood Risk Management Plans** (= plans to reduce flood risks, covering all elements of the flood risk management cycle: prevention, protection and preparedness), *DL 2015*

*Review/update every 6 years thereafter*
Flood hazard map is defined as a map showing the areas where floods must be taken into account including the probability of flooding and the degree of danger (e.g. water depth).
The number of inhabitants in flood hazard area

- Modelled area
- Inundated area
- Flood protected area

Inhabitants in 250x250 m cells
- 1-10 inhabitants
- 11-20 inhabitants
- 21-40 inhabitants
- 41-60 inhabitants
- 61-120 inhabitants
- 121-500 inhabitants
- 500-2500 inhabitants

Max. water depth in the cell
- 0 - 0.5 m
- 0.5 - 1 m
- > 1 m
- Flood protected area
21 areas of potential significant flood risk in Finland

- 21 areas were named as areas of potential significant flood risk in Finland by the Ministry of Agriculture and Forestry in December 2011
  - 17 areas for fluvial floods
  - 4 areas for sea floods
  - No areas for pluvial floods

- The decision was based on the preliminary flood risk assessment
Examples of areas of potential significant flood risk

1. **The City of Pori**
   Direct damages 200-300 million € in serious ice jam flood, estimated probability 0.5 – 1%
   Objective is to avoid damages in the City center and industrial cites in these situations

2. **The City of Huittinen**
   Direct damages 5-10 million € in 1% probability open water flood and ice jam flood
   Objective is to avoid damages for residential buildings and wastewater treatment plant in these situations
Preparing the flood risk management plans for river basins or coastal areas where significant flood risk area exist

ELY-centre prepares a proposal for flood risk management plan

Processing of the plan in Flood management group

Hearing (6 months)

ELY-centre finishes the proposal for flood risk management plan and delivers the plan to Ministry of agriculture and forestry after it has been processed in Flood management group

Flood risk management planning

Timelimit 22.12.2015

Review and update every 6th year
Flood management groups

- Flood management groups consists of Regional councils, Centers of Economy, Transport and Environment, municipalities, area’s rescue service and other authorities.

- The flood management group:
  1) processes the studies and documentation prepared for the flood risk management plan
  2) sets the objectives for flood risk management
  3) approves the proposal for the plan and the measures included in it.

- Organize sufficient interaction between the authorities and local stakeholders.
Flood risk management plans

Flood risk management plans should include:

- Flood hazard and flood risk maps
- Objectives of flood risk management taking into account adaptation to the climate change
- Measures for achieving the objectives
  - including costs,
  - benefits,
  - priority of measures
  - coordination with water resources management plans
- Environmental report
- Description of the activity during threat of flood and flood event
- List of competent authorities
Flood risk management measures

- Should be described in the flood risk management plan
- Doesn’t require detail planning or realisation of the proposed measures

Case Study of the River Kokemäenjoki

- **Flood Risk Prevention**
  - Land use planning
  - Lowest building elevation guidelines

- **Flood Prevention**
  - Adaptive lake regulations
  - Frazil and ice jam prevention
  - Water retention and controlled flooding

- **Flood Protection**
  - Dredging
  - Embankment
  - New channels
  - Individual property protection

- **Preparedness**
  - Run-off forecast and warning systems
  - Flood prevention and protection rehearsals
  - Public guidance
  - Rescue preparedness plans
  - Temporary flood protection structures