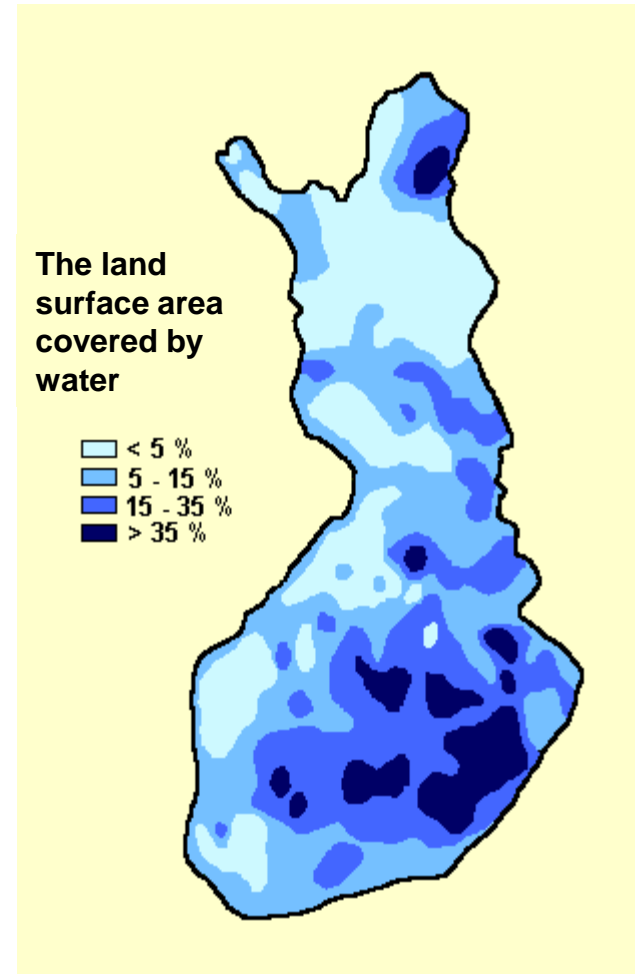


# Implementation of Water Framework and Flood Directive in Finland

**Markku Maunula**  
**Finnish Environment Institute**

# Finland is rich in freshwater

- About 11 % of surface is covered by water
- The number of lakes larger than 1 hectares (10 000 m<sup>2</sup>) is 56 000



# Water resources

## Groundwater

- Total number of classified groundwater areas: **6 200**
- Total water yield: **5.8 Mm<sup>3</sup>/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

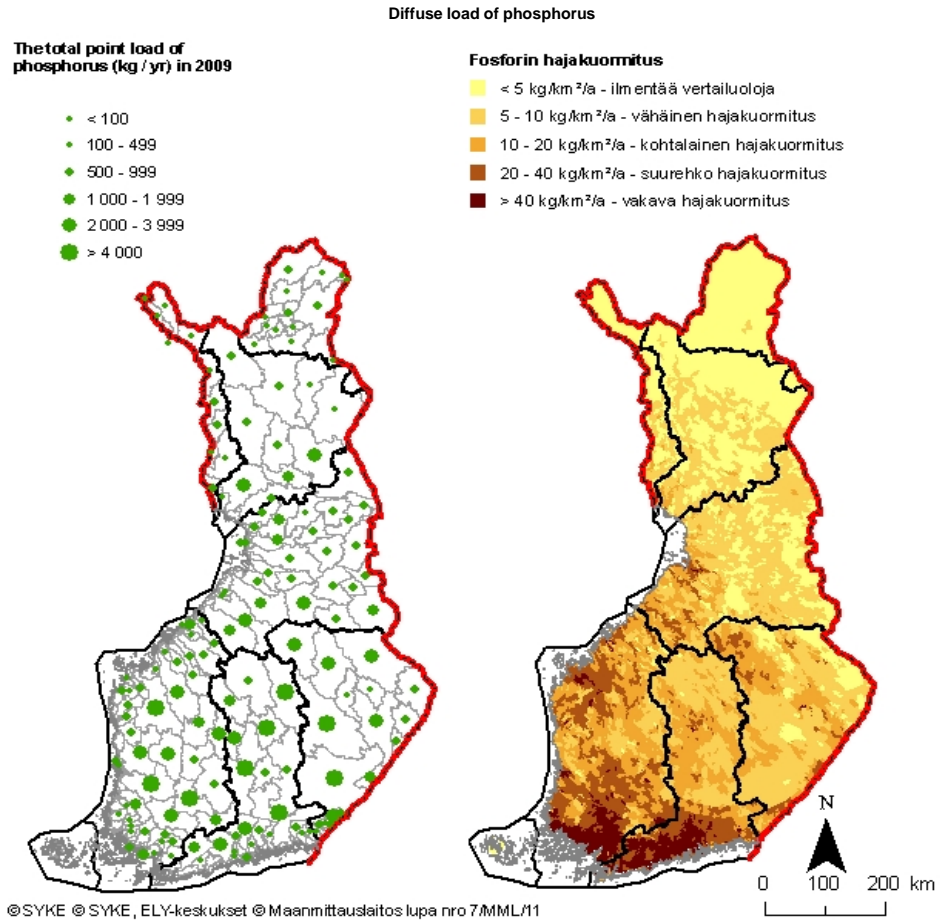


# Wastewater treatment

- 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
  - Legislation (2003) sets minimum standards for the treatment of wastewater from households outside sewerage networks






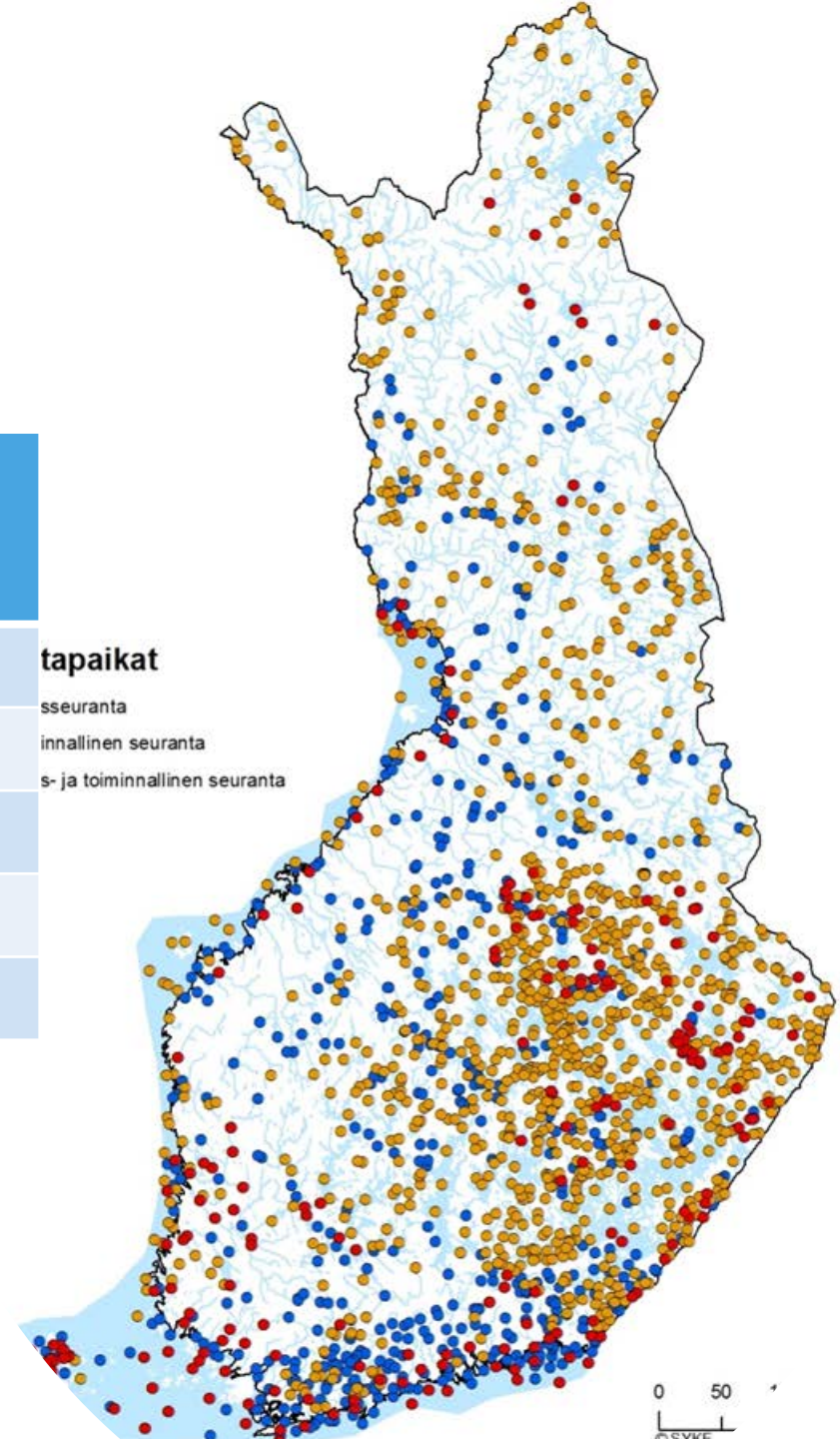
# Nutrient load: phosphorus 1/2



# Number of water bodies and monitoring stations

Surface water category	WFD 2010	
	sites	water bodies
Lakes	787	4275
Rivers	433	1602
Coastal	127	276
<b>Total</b>	<b>1347</b>	<b>6153</b>

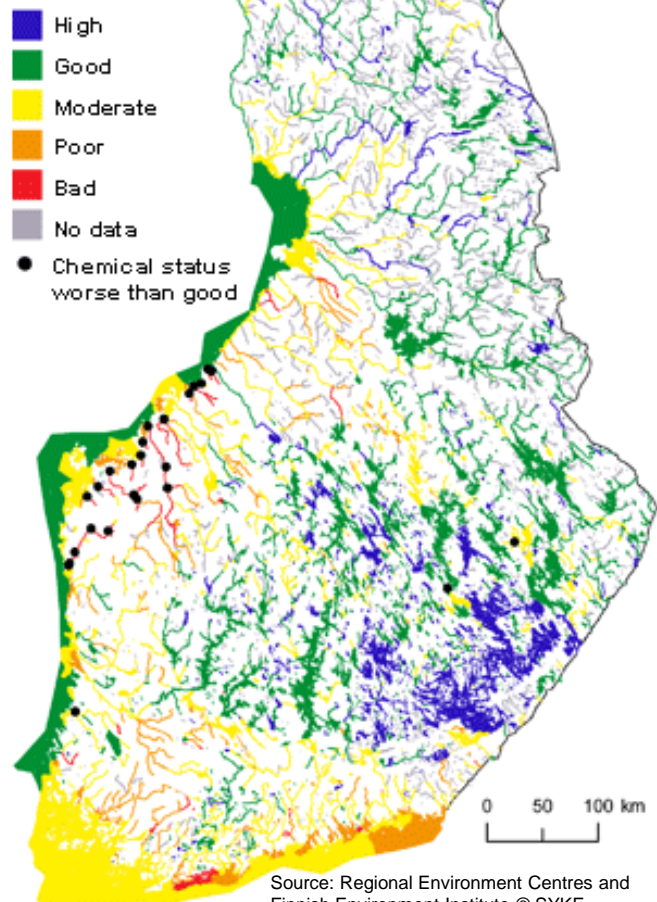
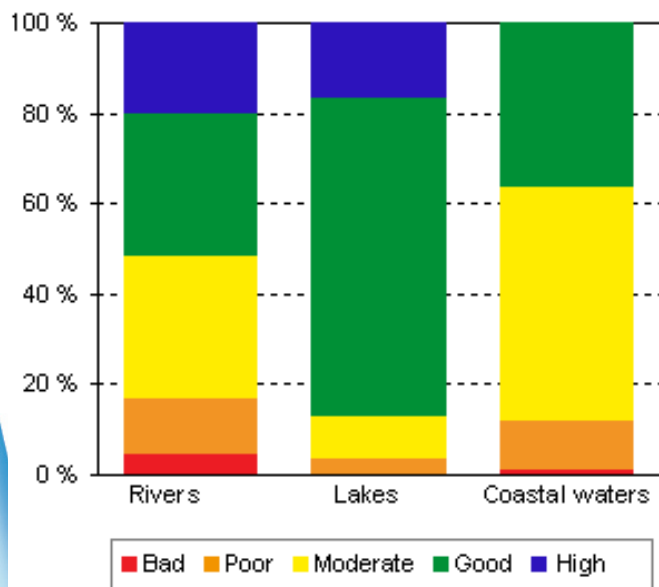
	Surveillance monitoring
	Operational monitoring
	Both



# Ecological status of surface waters

by proportion of total length (rivers) or surface area

Ecological status	Rivers	Lakes	Coastal waters
High or Good	52%	87%	36%
Moderate, Poor or Bad	48%	13%	64%



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



Ministry of the Environment

Ministry of Agriculture and Forestry

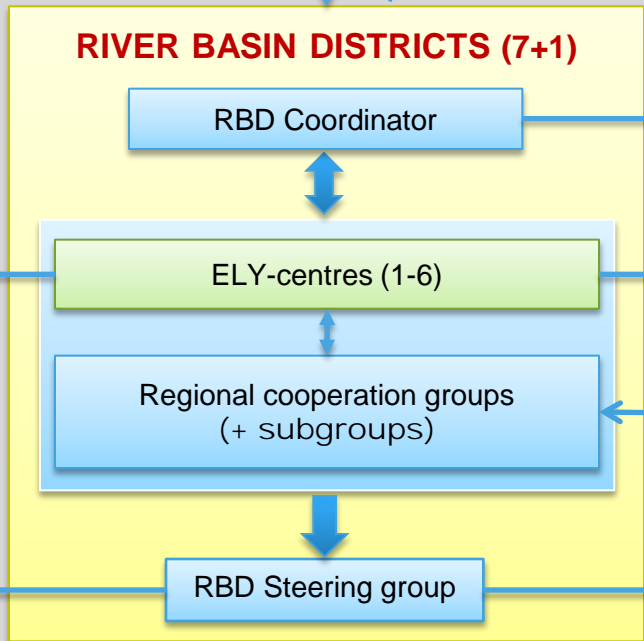
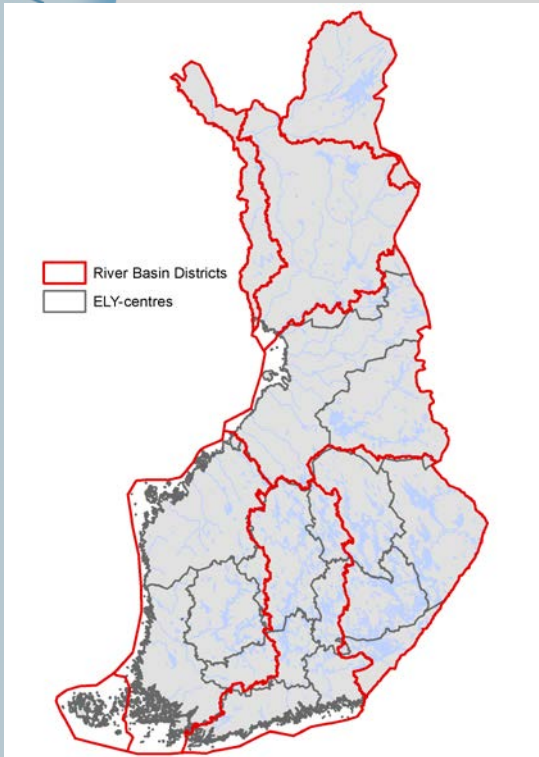
National Coordination Group

Finnish Environment Institute (SYKE)

Finnish Game and Fisheries Research Institute (RKTL)

GUIDANCES

GUIDANCES



Municipalities,  
Enterprises  
Local authorities  
Citizens  
Universities  
Other local actors

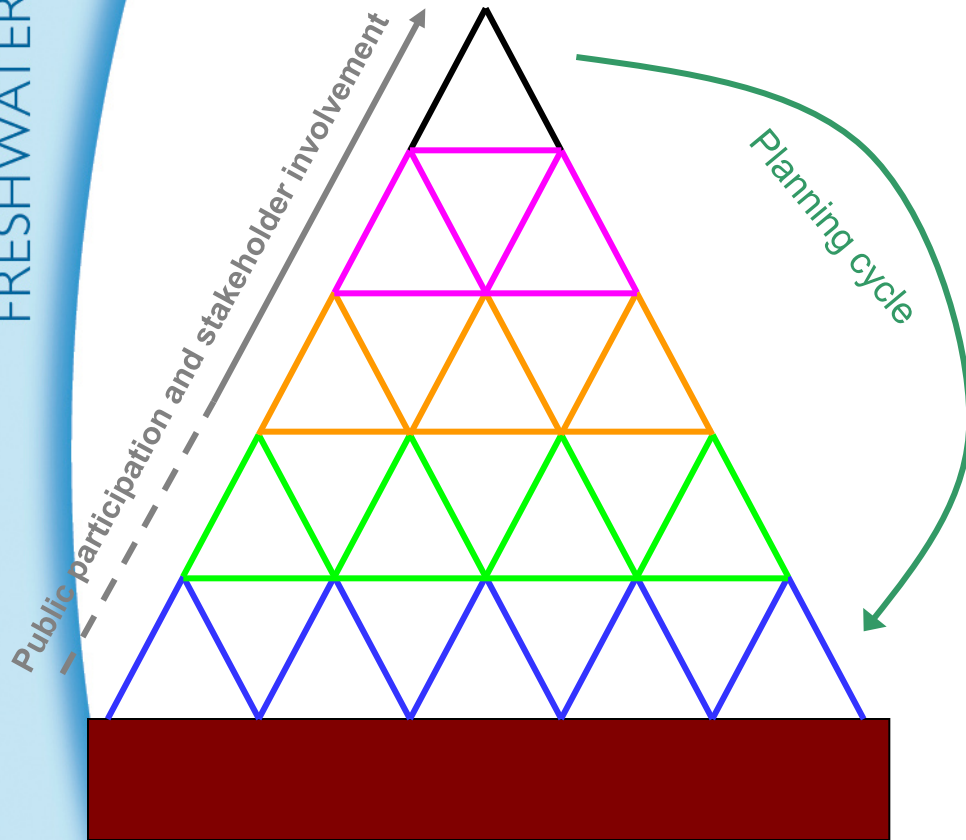
**RIVER BASIN MANAGEMENT PLAN**

Municipalities, enterprises and local authorities

Citizens and other local actors

Government organizations

# 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



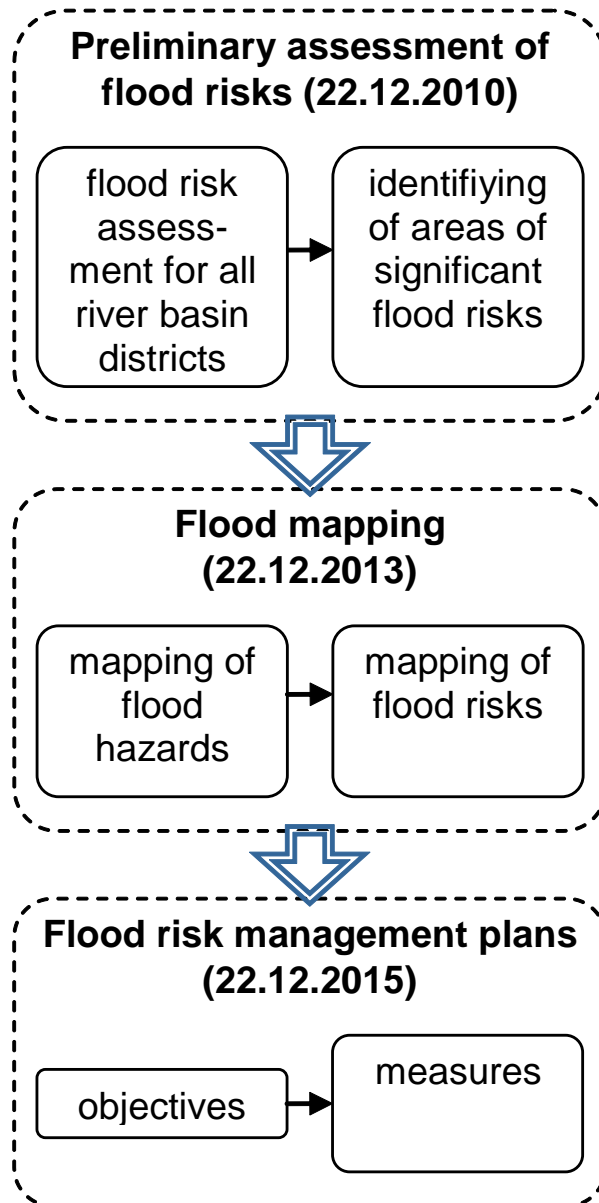
## New Legislation for Flood Risk Management in Finland

- 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



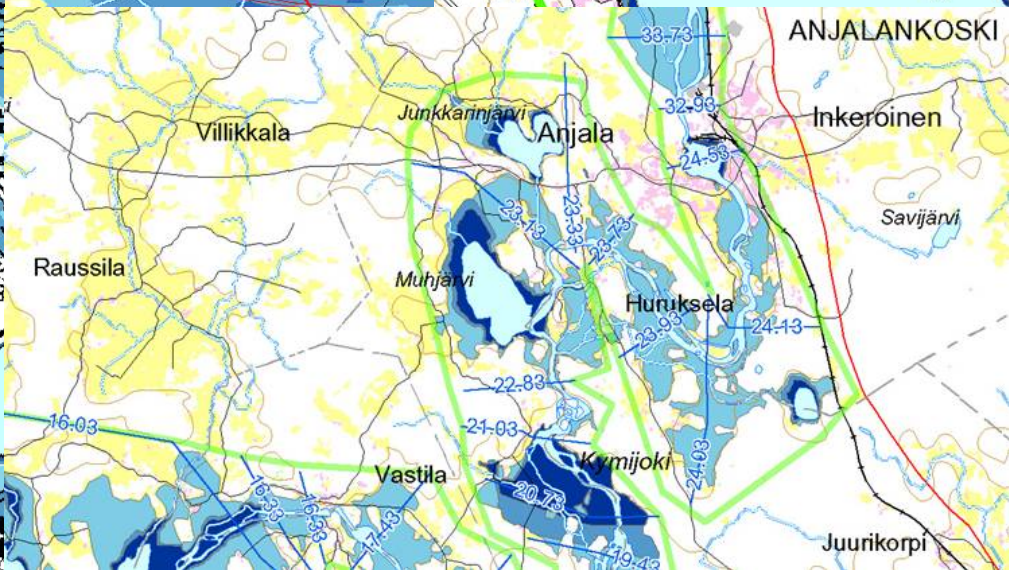
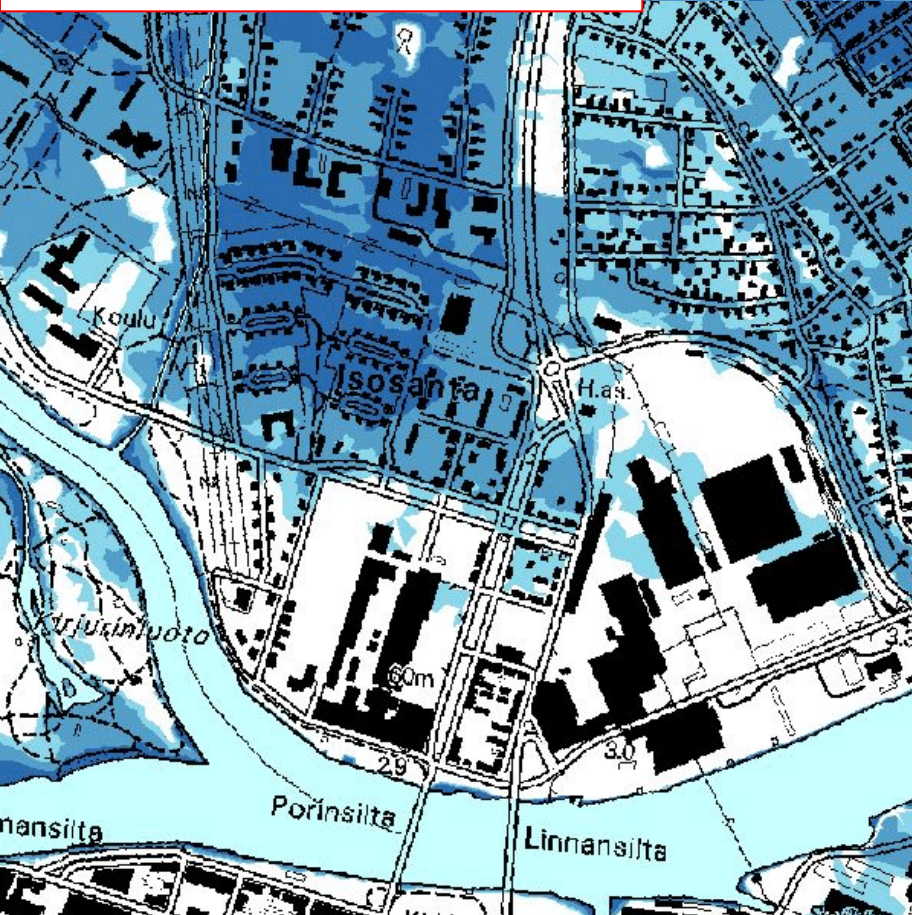
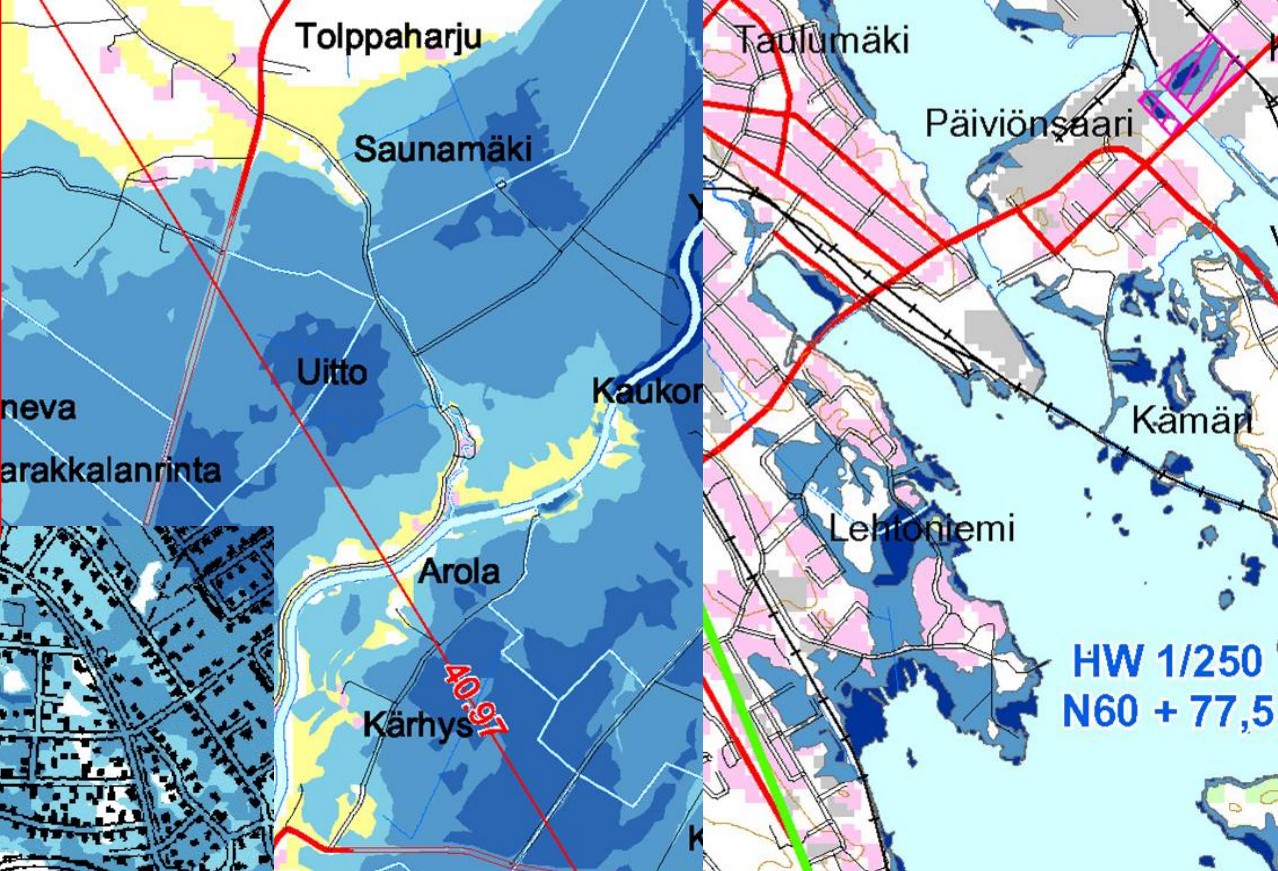
## Three main steps

From identification to management of flood risks






- **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)










HW 1/250  
N60 + 77,5





# 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

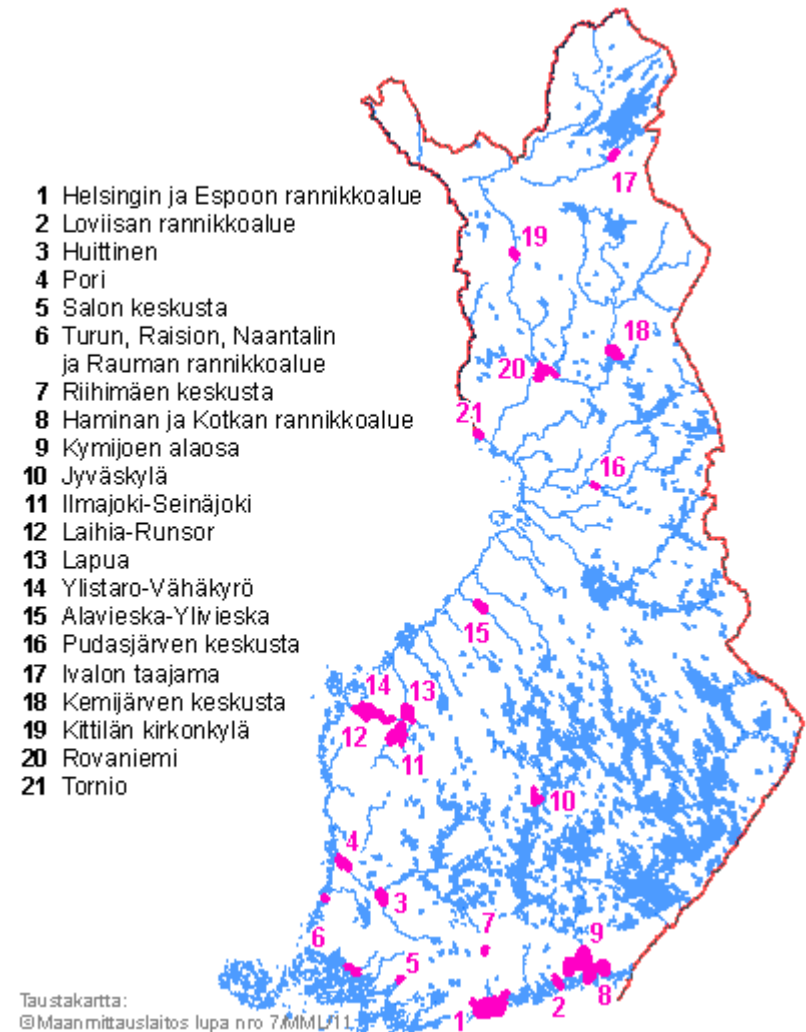
## Max. water depth in the cell

-  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 sites 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**



# Flood risk management planning

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

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

