Modelling of river basins: Scenarios

Highlights from the SCENES project

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EurAqua Conference 2008, Oslo, 24 October

Water Scenarios for Europe and for Neighbouring States

6th EU Framework IP Project

4 years - 1 Nov. 2006 – 31 Oct. 2010

2 Co-coordinators at CESR and SYKE

~~22~~ 23 partners, 17 countries

7 Million euros EU contribution

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Aim of the project

To develop and analyse a set of **scenarios** of Europe's freshwater futures up to 2050

The scenarios will:

- provide reference point for strategic planning
- alert policymakers and stakeholders
- allow river basin managers to test water plans

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What is a scenario?

What is NOT a scenario?

Scenarios are not **forecasts**, **projections**, or **predictions**.

Scenario anatomy

Boundaries
- Spatial
- Thematic
- Temporal

Key Dimensions
- Variables

Current Situation
- Historic context
- Institutional description
- Quantitative accounts

Driving Forces
- Trends
- Processes

Critical Uncertainties
- Resolution alters course of events

Plot
- Captures dynamics
- Communicates effectively

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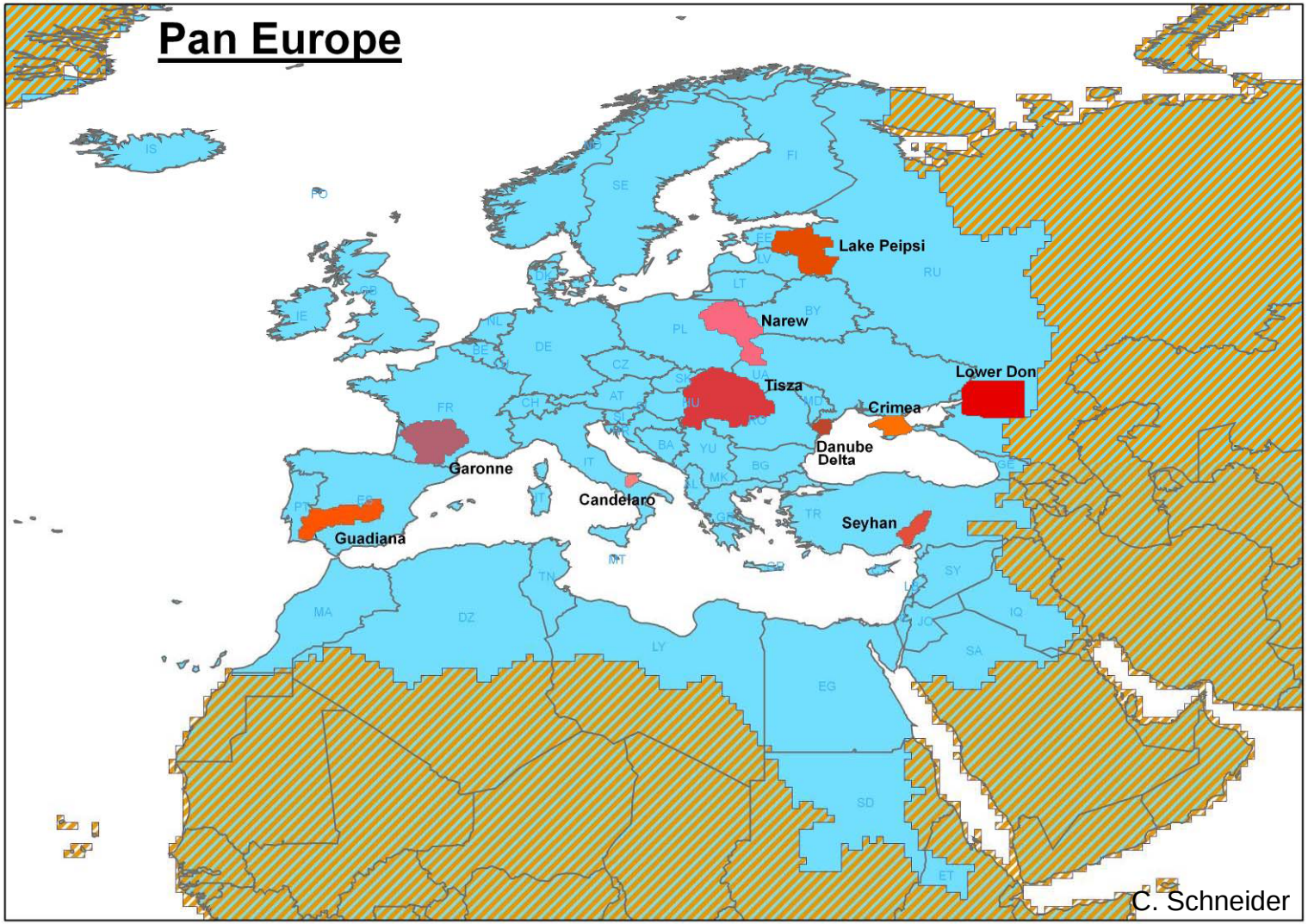
Pan-Europe with Pilot Areas representing Case Study Regions



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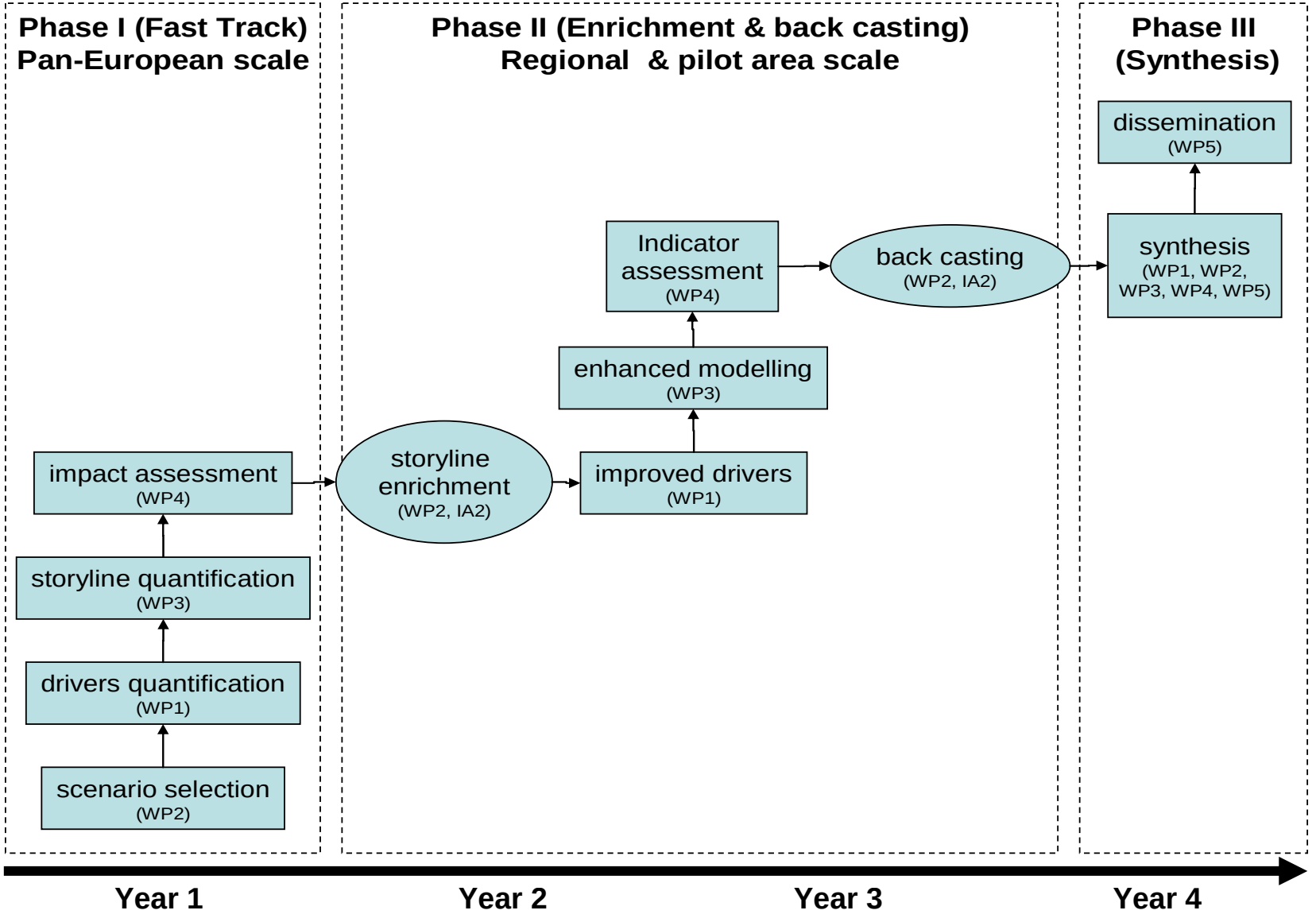
Phases within SCENES



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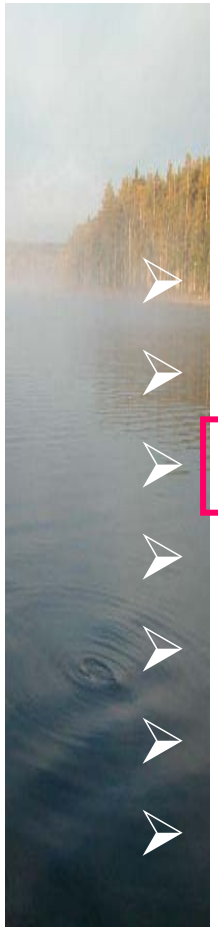
Phase I: Fast-track (year1)



Objective to provide a flying start for SCENES

Selection from existing global/regional scenario sets

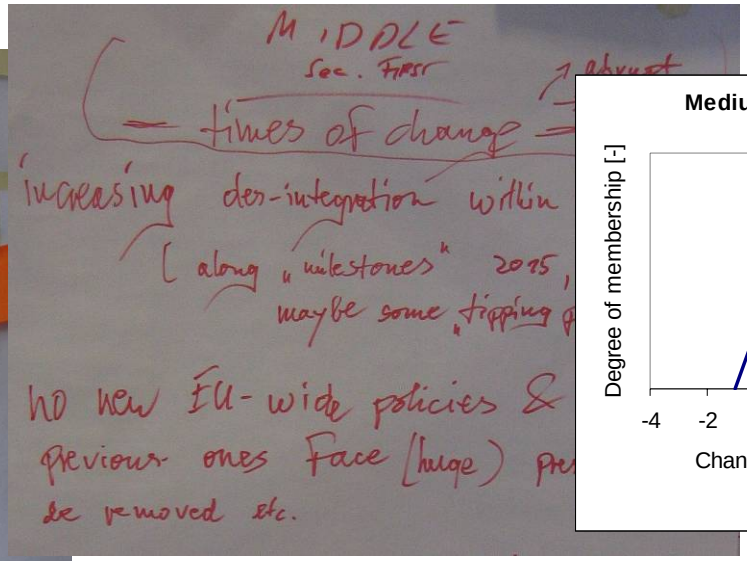
- IPCC-SRES (downscaled: EURURALIS, A-TEAM)
- Millennium Ecosystem Assessment (local/regional: SGAs)
- Global Environment Outlook (GEO-4 and [illegible]3)
- Visions/MedAction
- World Water Vision
- EEA European Water Outlook
- Global Water Outlook

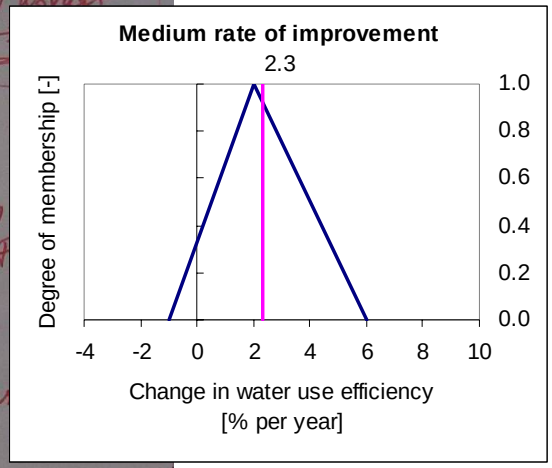
Selected

Fast-track scenarios: GEO-4

Stakeholder driven!

Specific input from the SCENES pan-European panel on qualitative and quantitative scenarios to develop European, water focused scenarios starting from GEO-4





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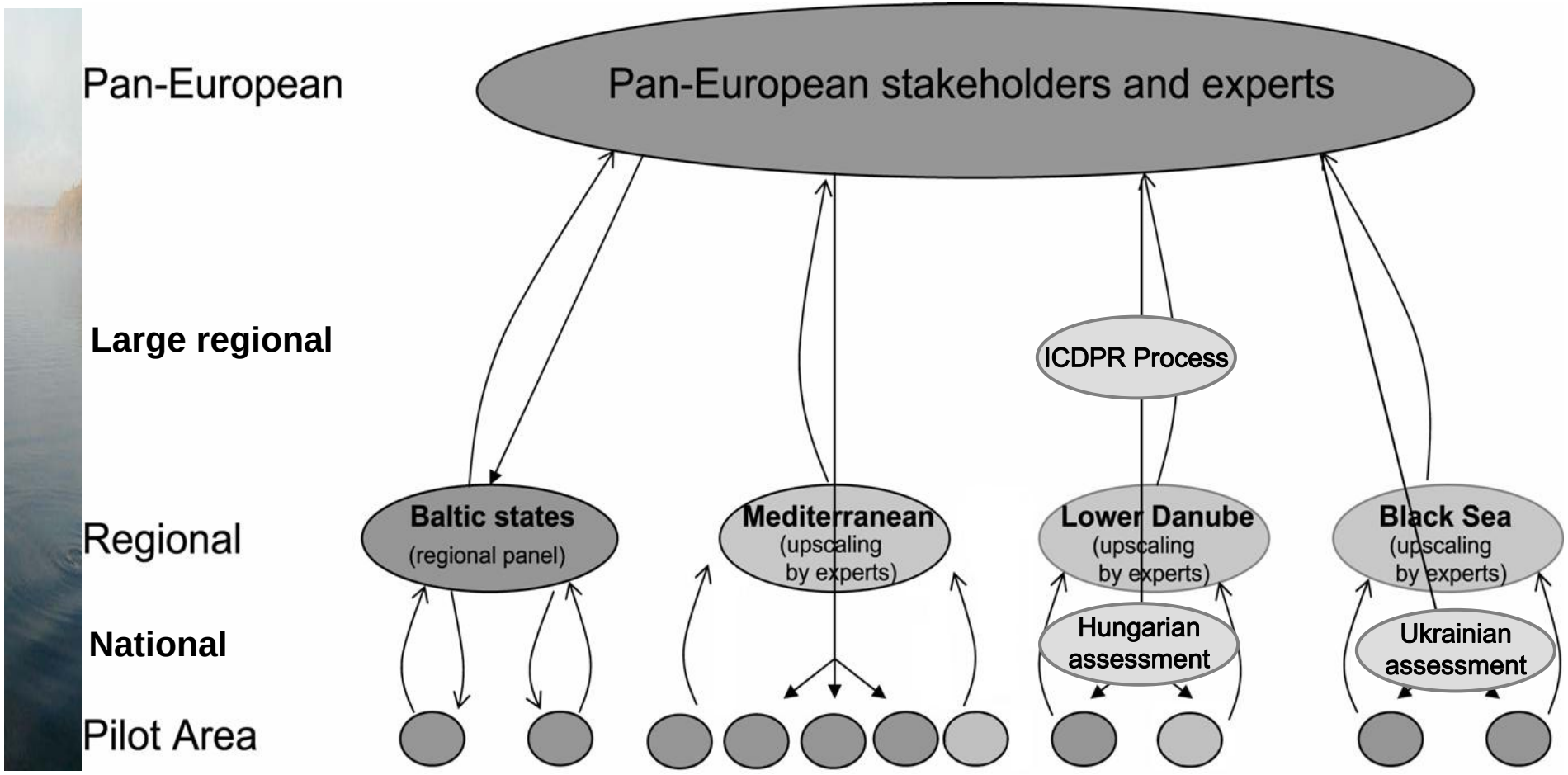
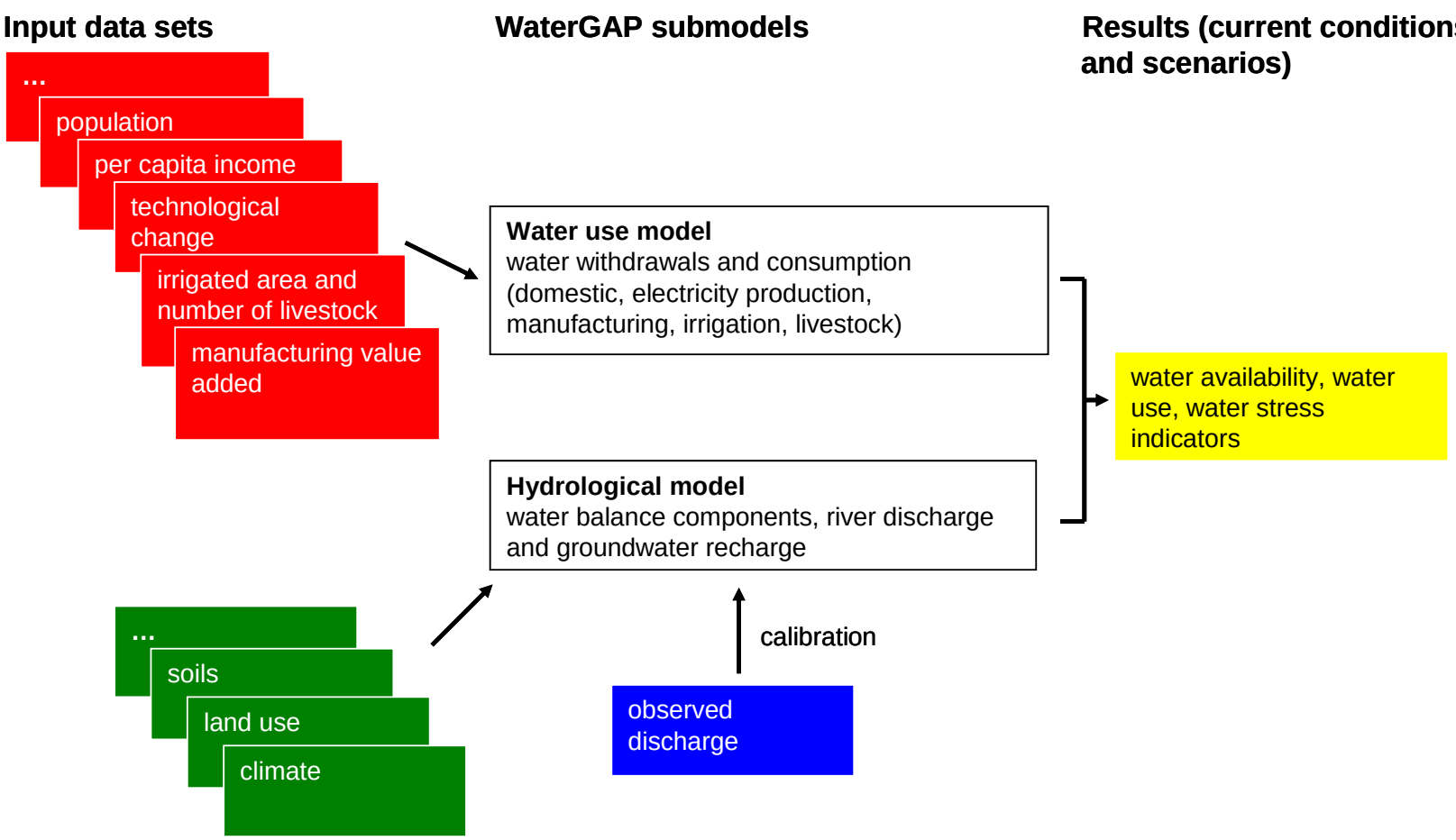
Stakeholder panels at different scales



Modelling tool: WaterGAP 2
(Water – Global Assessment and Prognosis)



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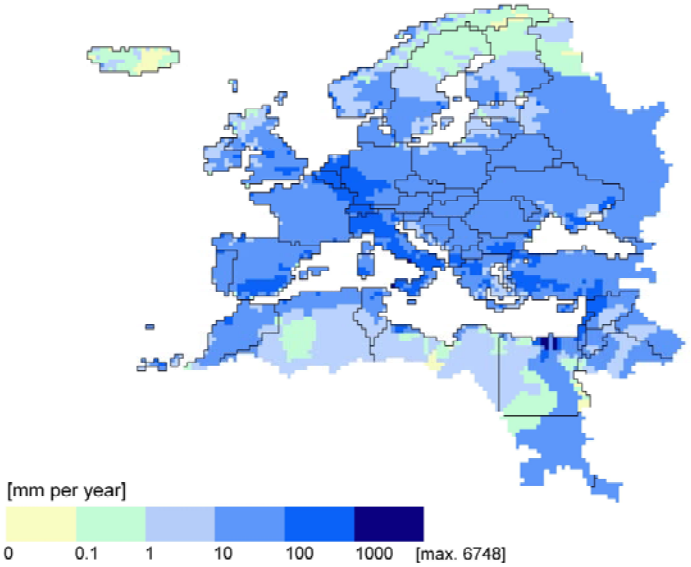
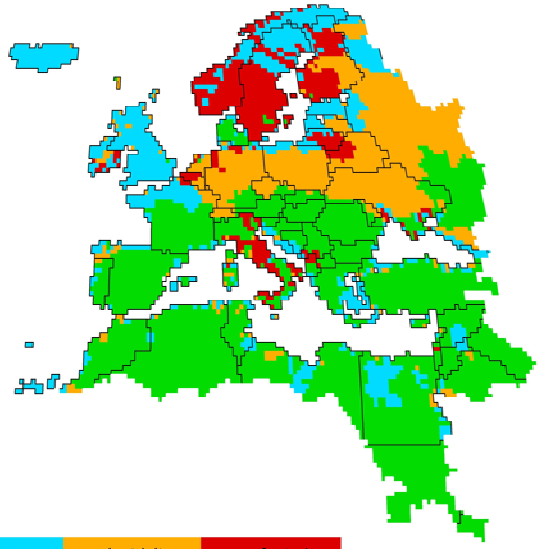
Current water withdrawals

Total water withdrawals on basin scale (2000)



(c) Center for Environmental Systems Research, University of Kassel July 2007- WaterGAP 2.1e

Most important sector per river basin (2000)



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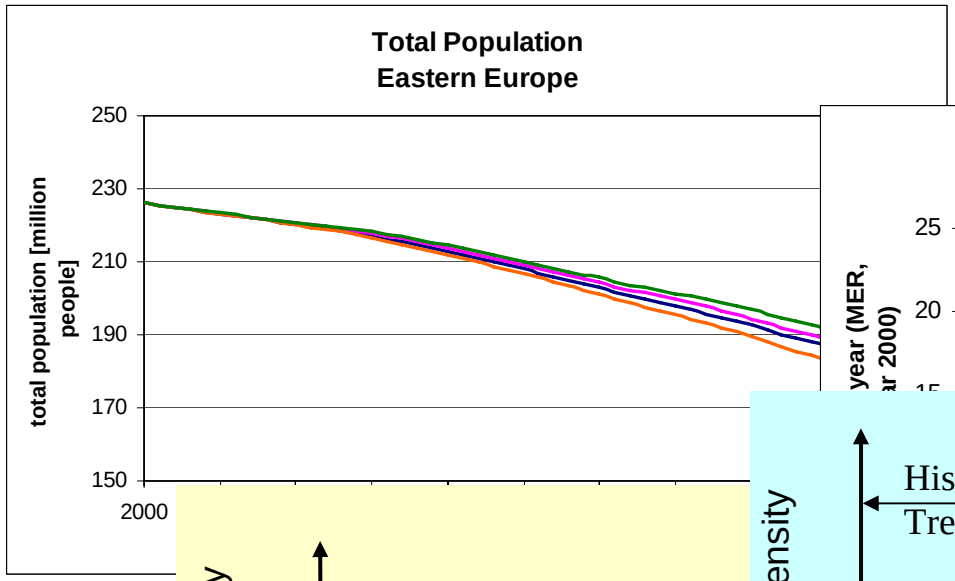
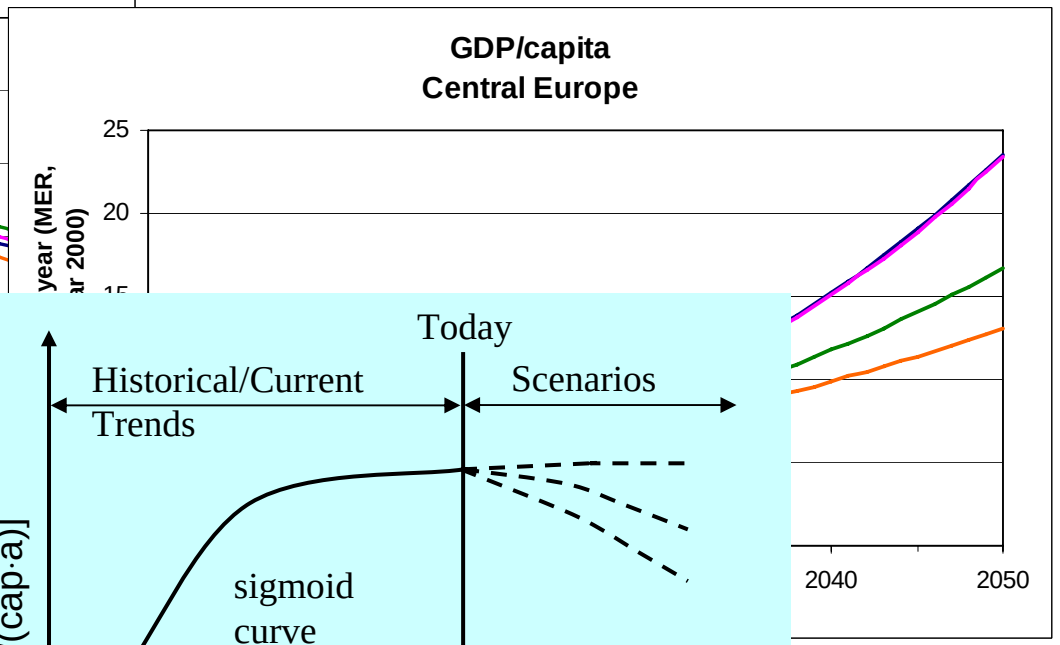
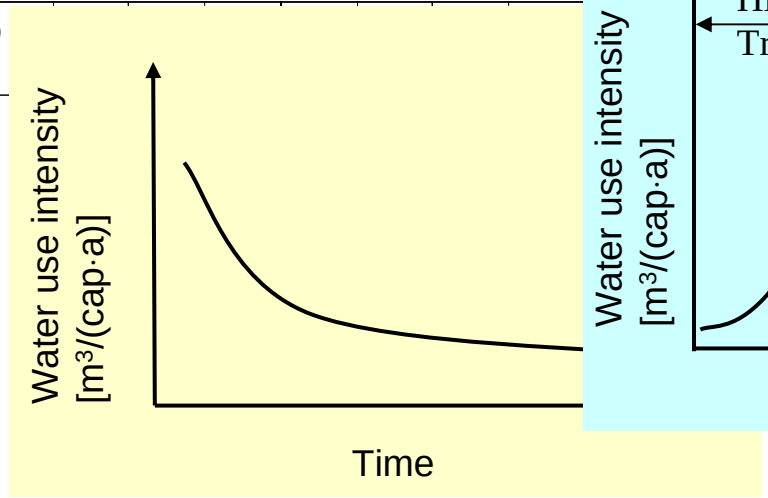
Factors affecting water withdrawals



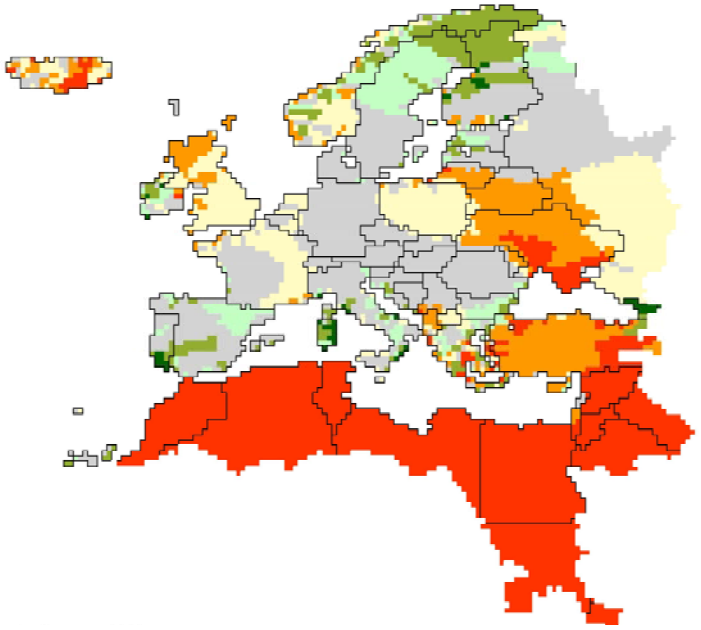




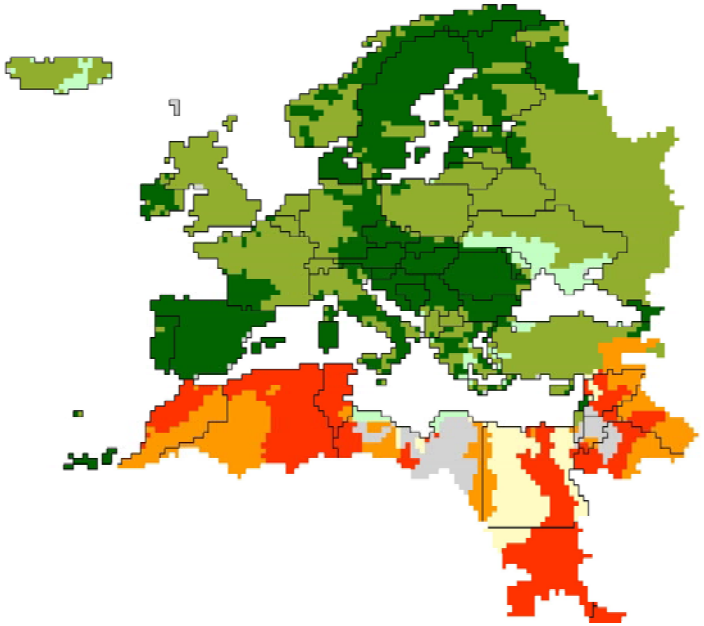
Source for population & GDP: IF's model

Change in domestic water withdrawals
Security First & Sustainability First

Change in domestic water withdrawals on basin-scale
(Security First, 2030)



Change in domestic water withdrawals on basin-scale
(Sustainability First, 2030)



Percentage change to the year 2000

-50 -25 -10 10 25 50 no data

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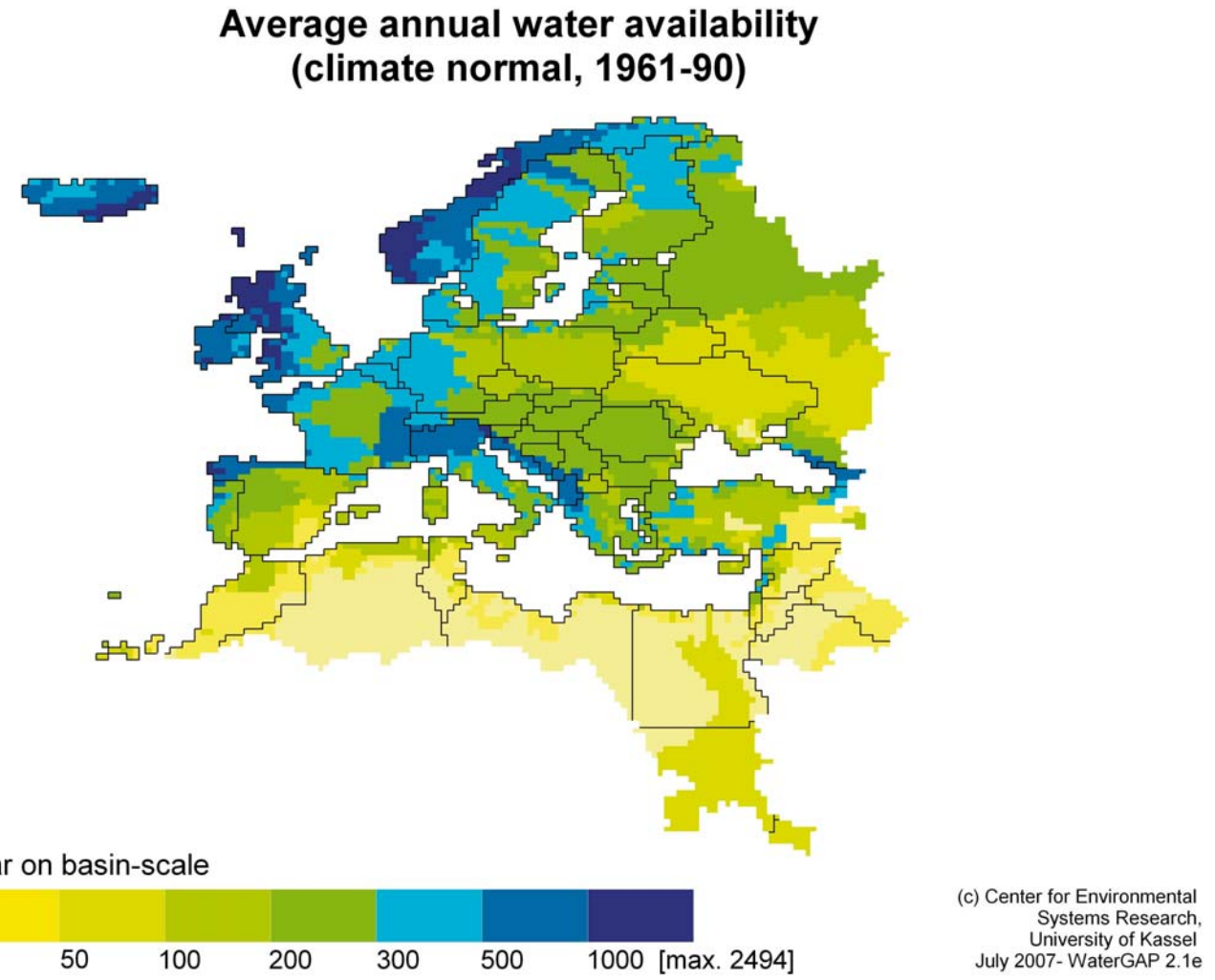
Conclusions on Water Use

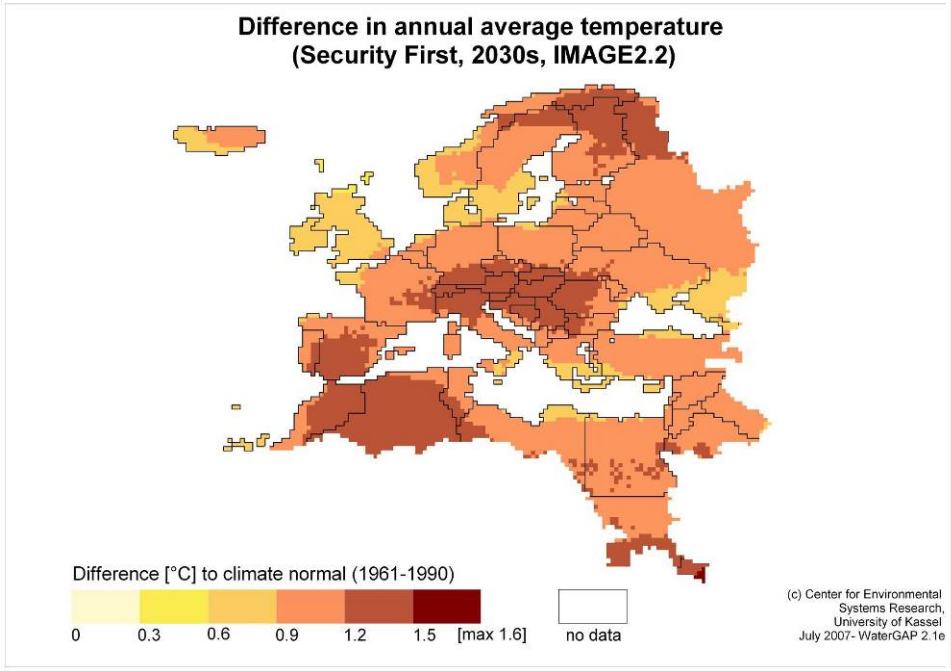
Sustainability First as compared to Security First for the domestic water withdrawals:

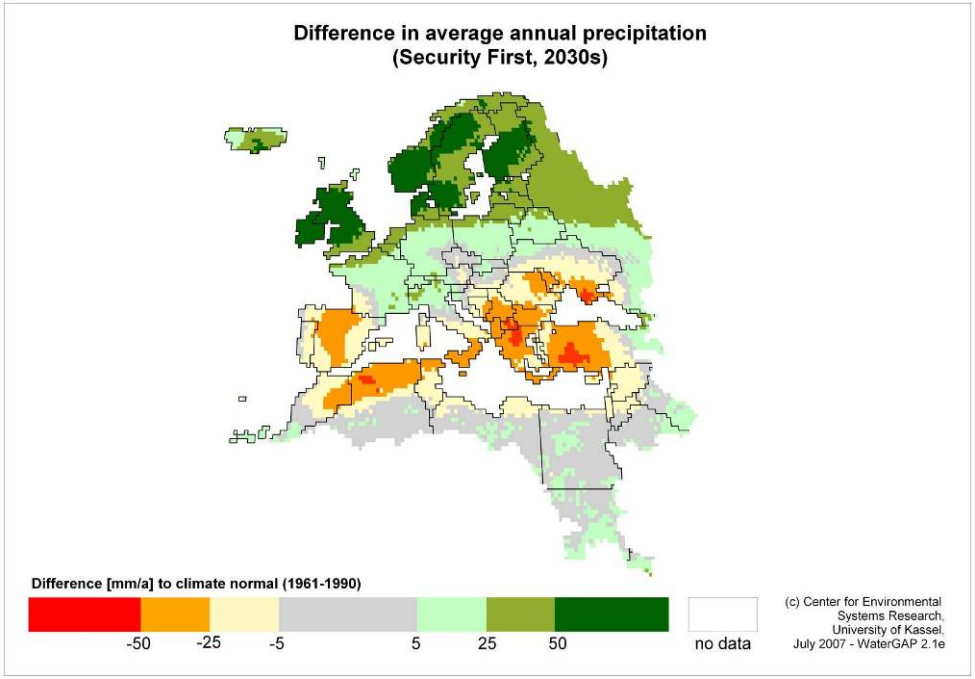
- Higher population and economic growth => Higher withdrawals
- Faster technological improvements and water-saving behavior => Lower withdrawals (outweighs other factors)

Long-term water availability



Factors affecting water availability

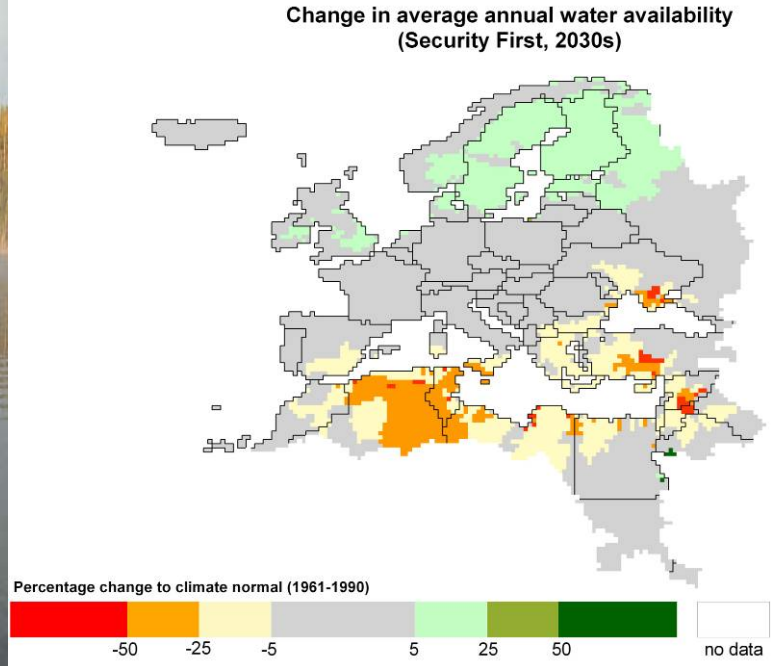


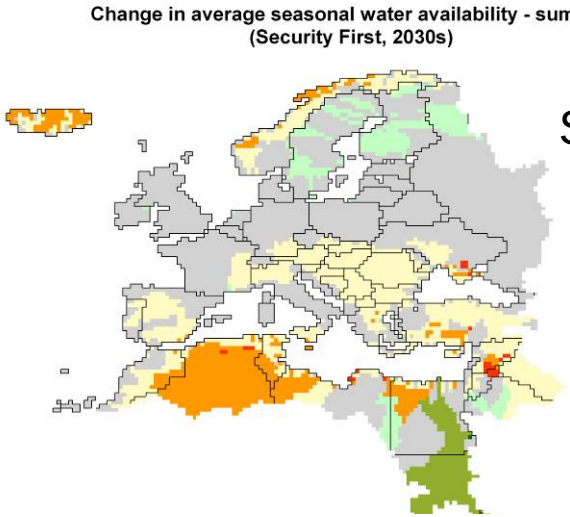


Source: IMAGE 2.2 model

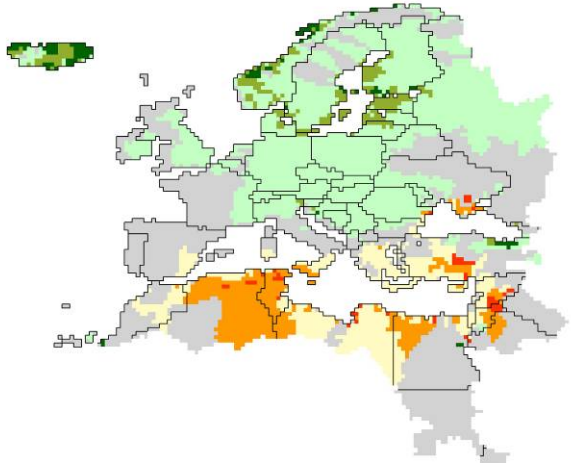
Change in water availability

Security First (between current climate & 2030s) [%]





Summer



Winter

Conclusions on Water Availability

Climate induced changes in Water availability up to 2030:

- Annual average changes – drier in the south; not big change over rest of Europe
- Larger seasonal differences
- Cause: Warmer temperatures (higher evapo-transp.) + Trend in precipitation
- Small difference between scenarios

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Conclusions on Water Stress

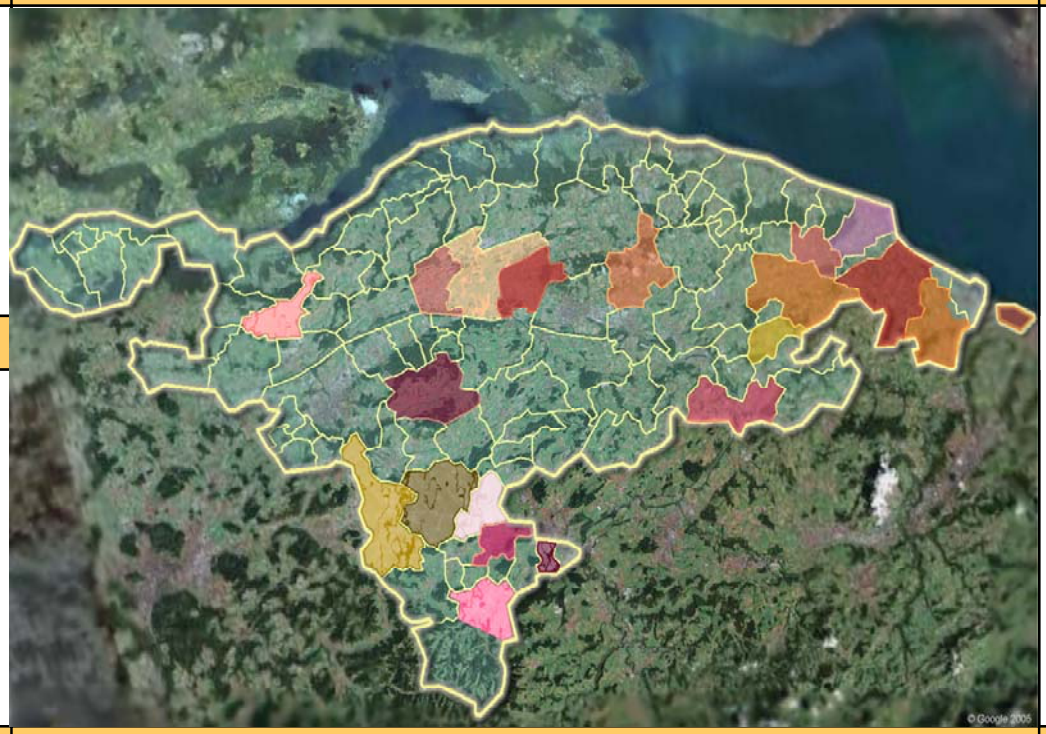
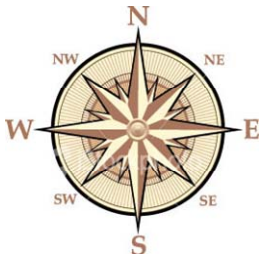
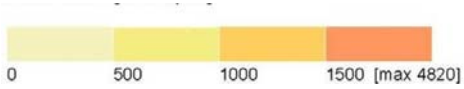
Summing up Water Use and Water Availability:

Scenarios show range of plausible futures

- pressure on water resources could increase or decrease
- Scenario-dependent, region-dependent

Interface to model results:

Web-based pan-European scenario service

Selection	Interactive Map	Navigation
Topic: water use Subtopic: irrigation Value: absolute Year: 2015 Scenario: A2 Scale: Country		ZoomIn Fixed ZoomIn Fixed ZoomOut Pan Identity 
Bookmarks o Africa o Asia o Australia o Europe o North America o South America		
Data	**Legend**	**Links**
Save Map Print Map Help me	  Scale: 1: 5000 Coordinates: E: 51,10° N: 10,10°	Charts Raw data Homepage

C. Schneider

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Next steps

2nd round scenarios

- following pan-European panel Delft Feb. 2008
- to be presented at the pan-European panel Helsinki Nov. 2008
- new driver information from SCENES partners

Water quality module

- point and diffuse sources
- river networks
- BOD, salts, coliform bacteria, nutrients

Thank you!

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Finnish Environmen

http://www.environment.fi/syke/scenes