



The Future of Water Resources in Europe - Perspectives until 2050



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and

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Overview



- SCENES - "Water Scenarios for Europe and for Neighbouring States"
- EU FP6 IP project
- November 2006 - October 2010 (April 2011)
- Coordination: SYKE and CESR
- 23 partner from 15 countries and 2 international organisations



Aim of the project



To develop and analyse a set of scenarios of Europe's freshwater futures up to 2025 and 2050

Environmental consequences of key socio-economic and political development as well as climate change



Aim of the project

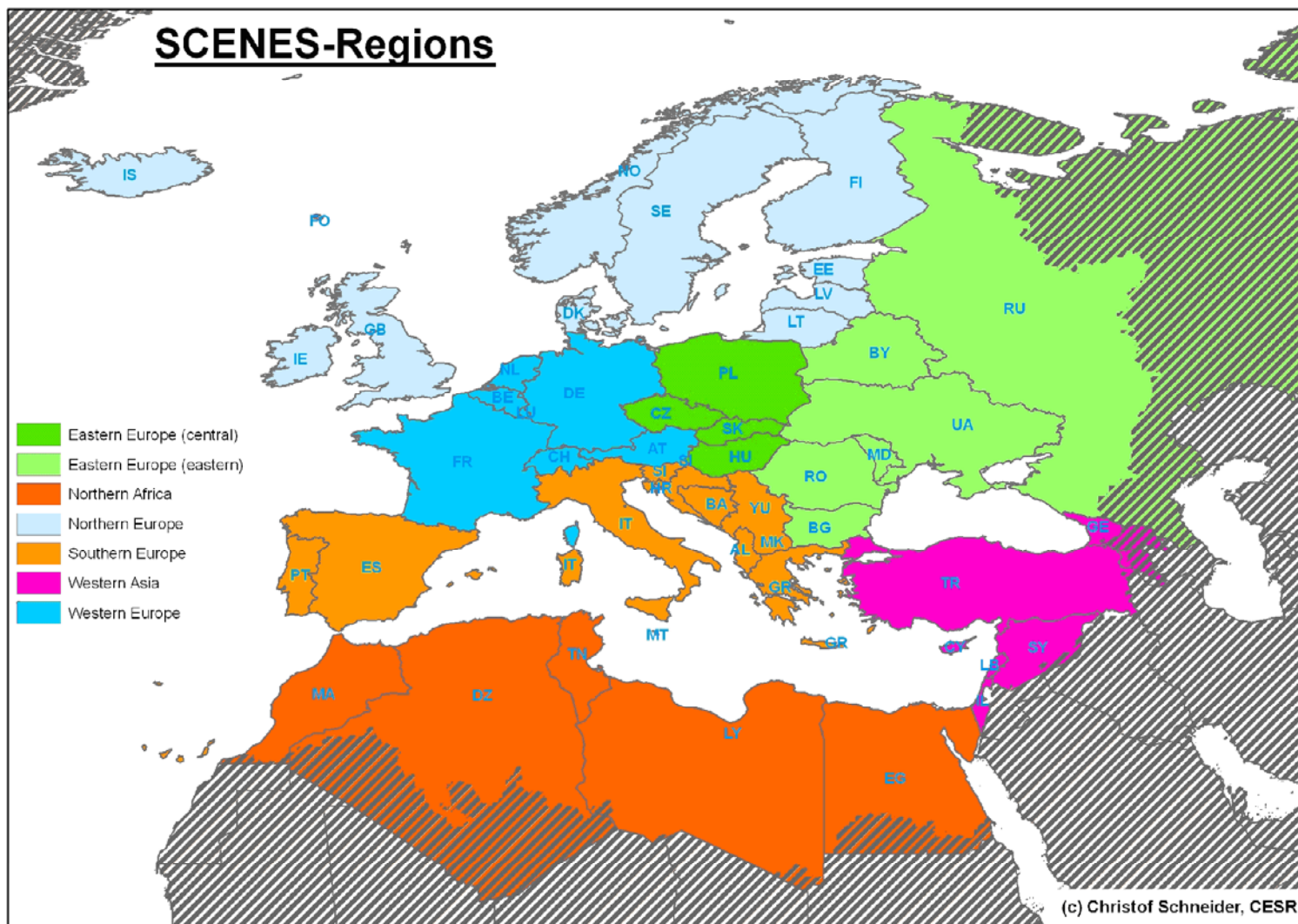
- Scenarios for water quality and quantity



- Qualitative and quantitative scenarios
- A pan-European extension
- Using stakeholder participation, modelling and indicators
- Starting point "Fast-track"

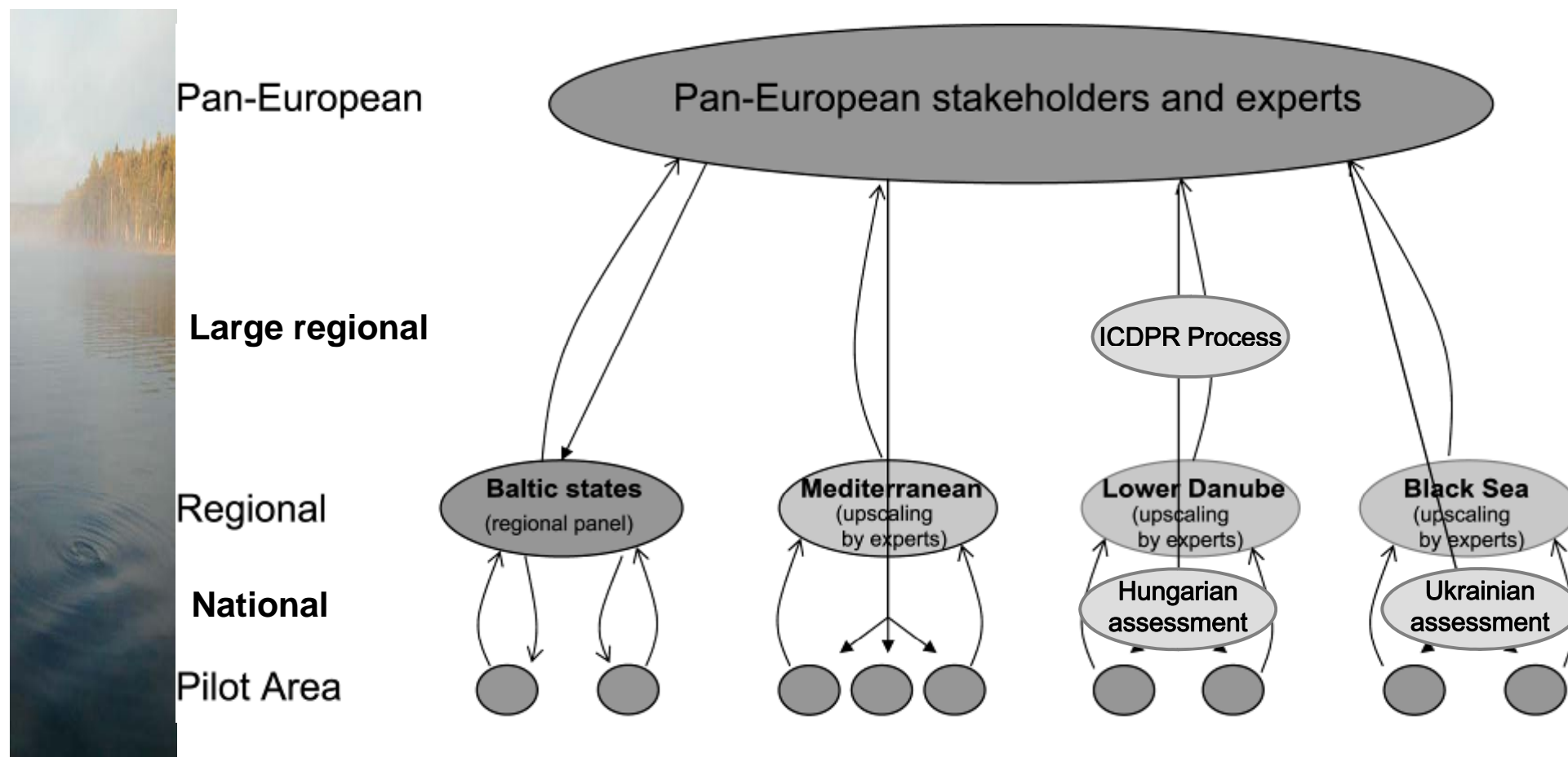


Geographical extension





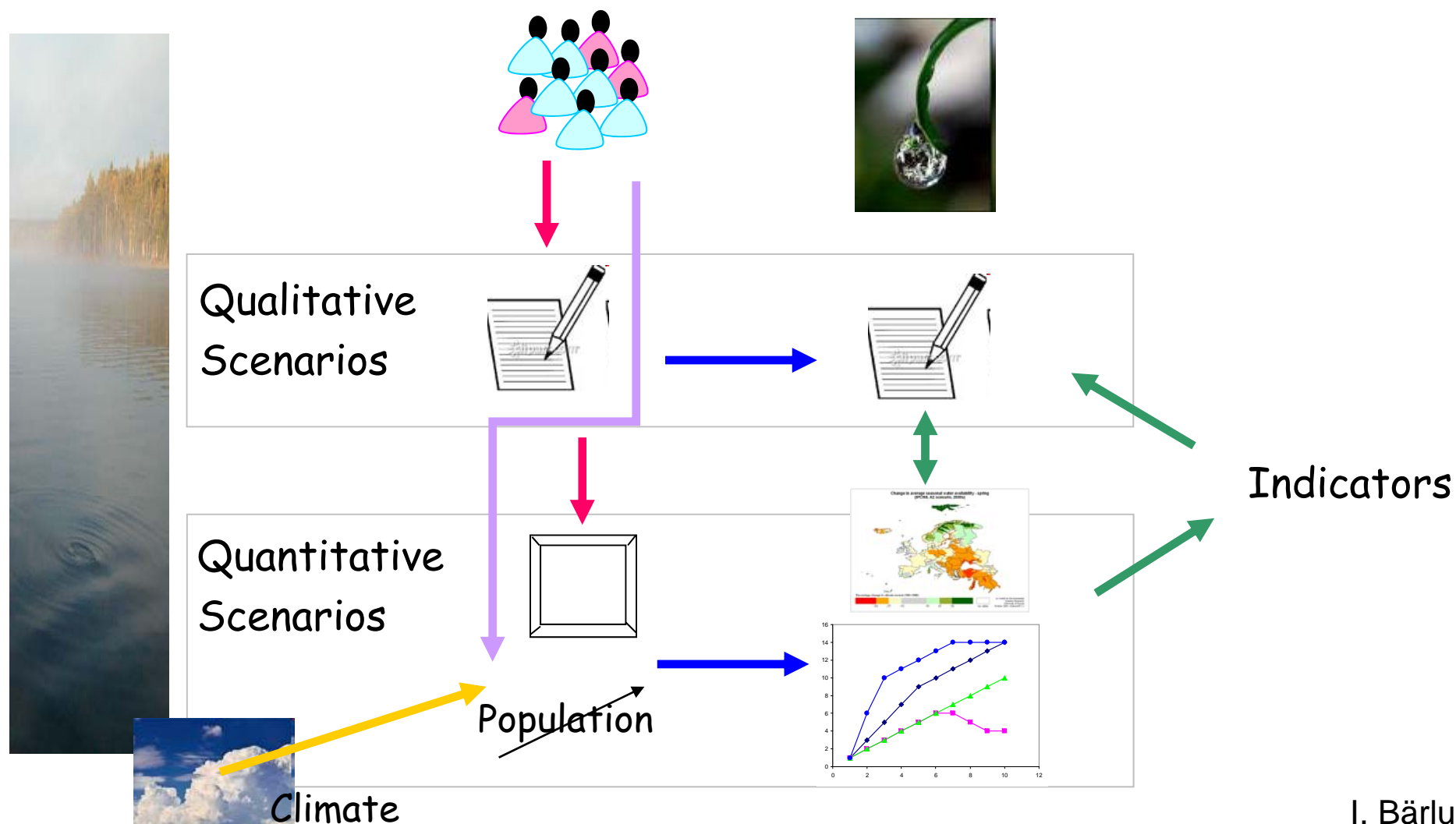
Stakeholder panels at different scales



M. van Vliet (WU) & J. Kämäri (SYKE)



SCENES scenario process

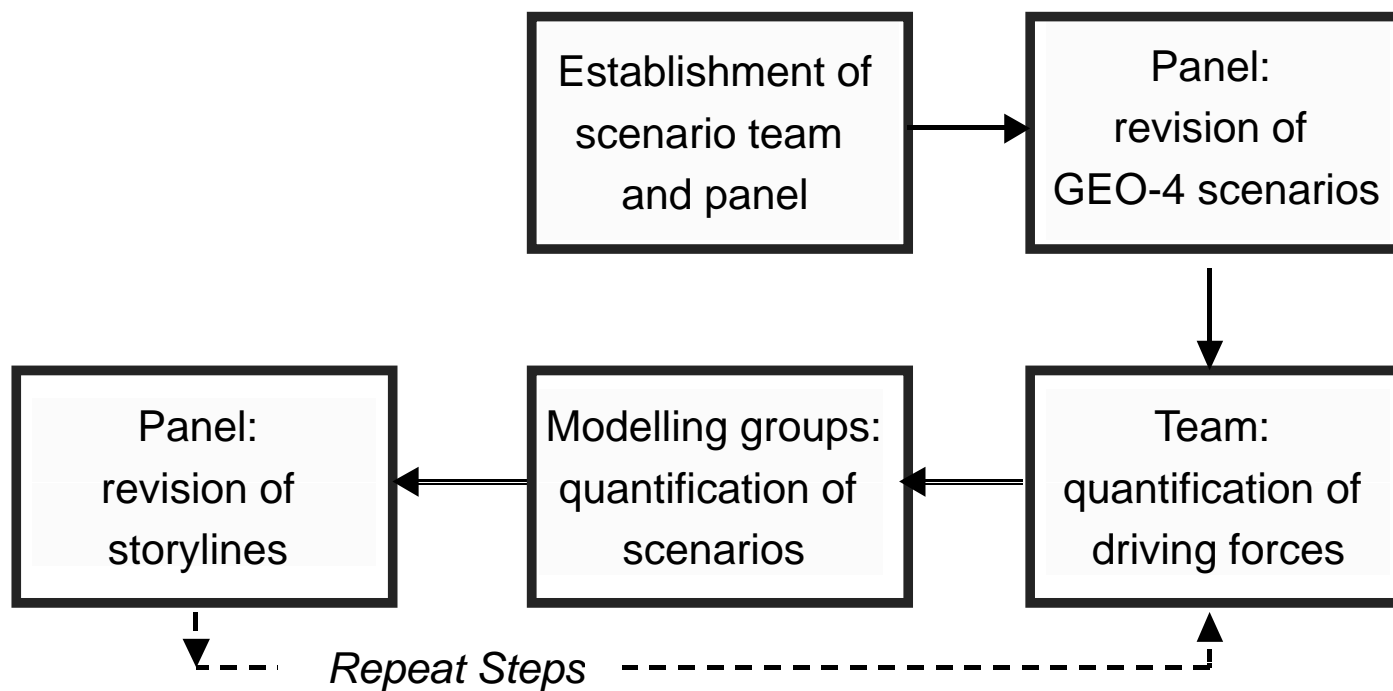


I. Bärlund



Scenario process scheme

Modified SAS (Story And Simulation) approach



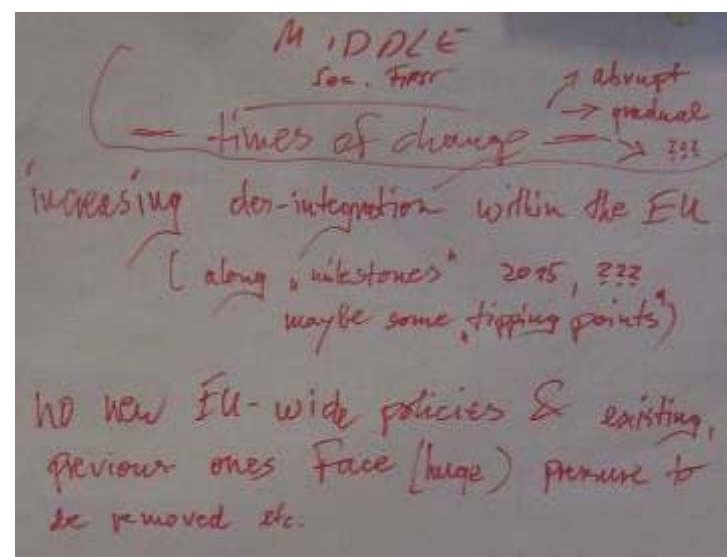
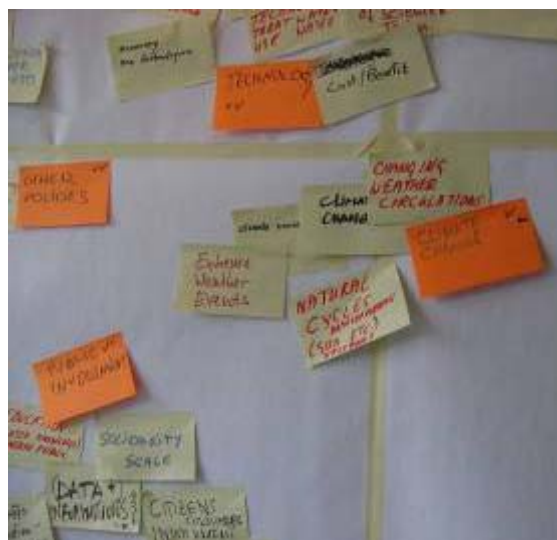
modified from J. Alcamo (CESR)

Bärlund&Flörke, Aalborg, October 2010



Storyline development

Specific input from the SCENES pan-European panel on qualitative and quantitative scenarios

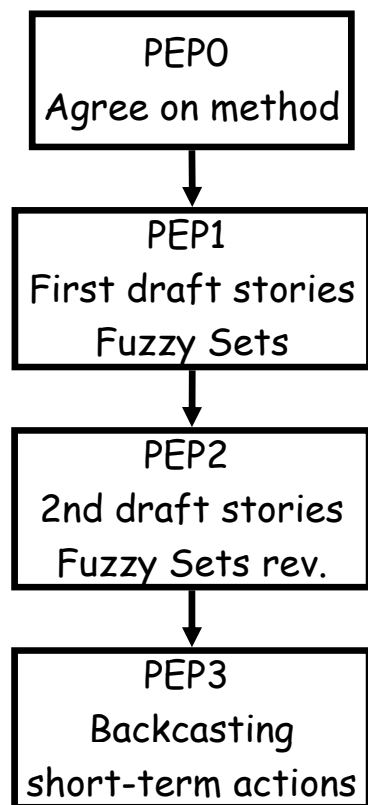




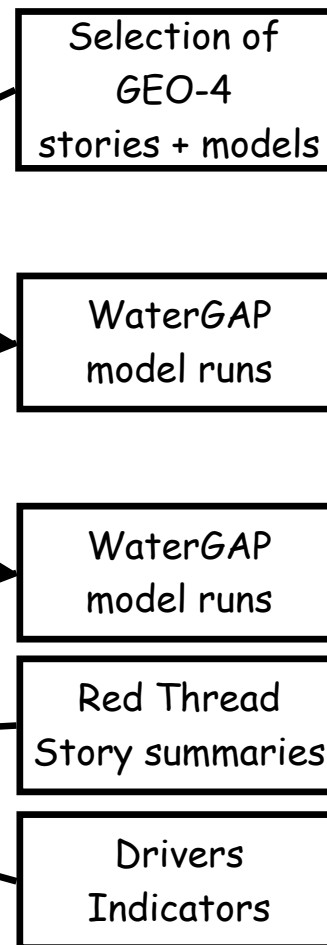
The Story-And-Simulation Approach



PEP meetings



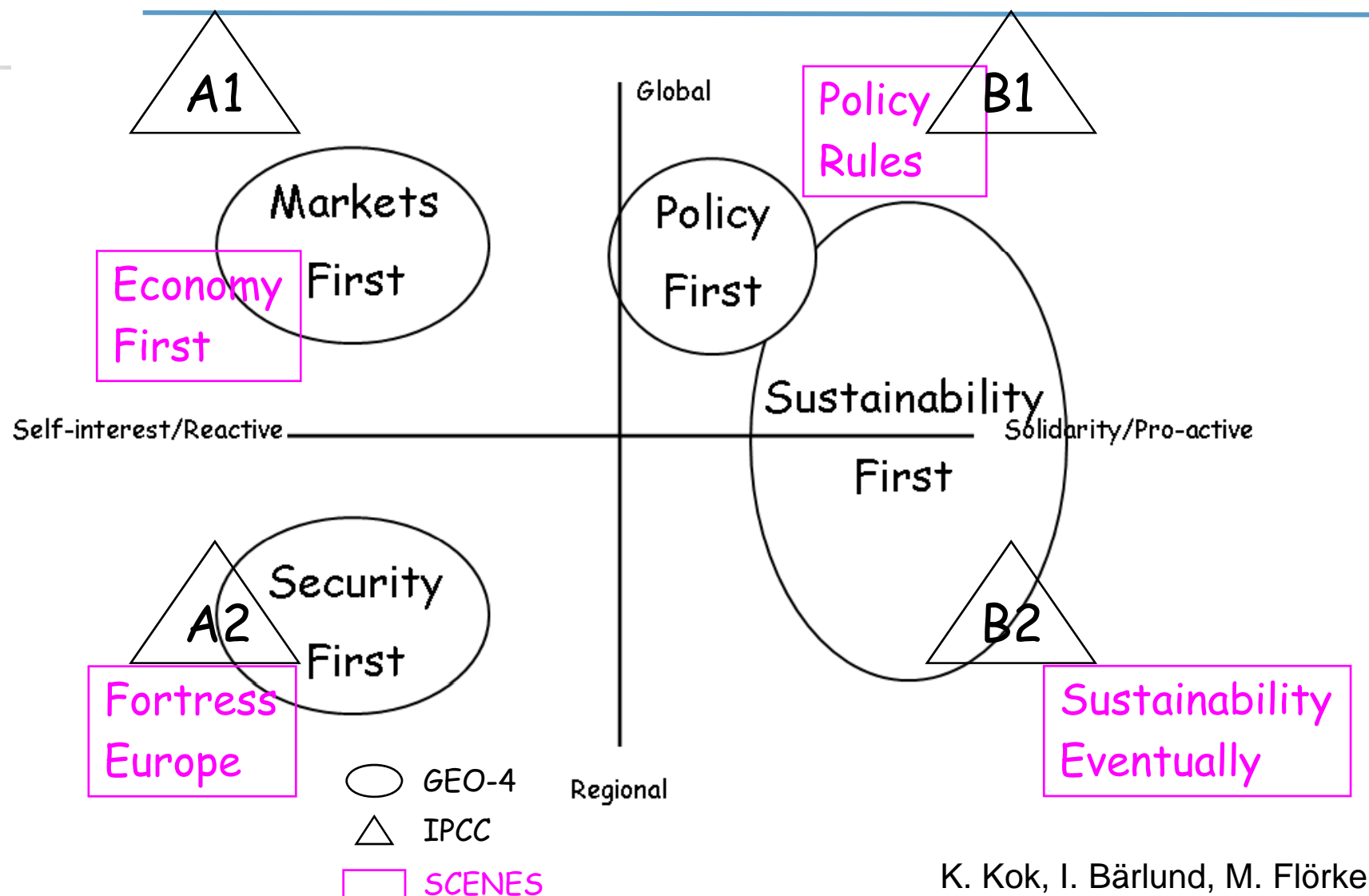
Other Activities



K.Kok



Scenario families



K. Kok, I. Bärlund, M. Flörke

Bärlund&Flörke, Aalborg, October 2010



Qualitative scenario development - supplementary techniques



Red Thread = Summary text, collages
and conceptual maps

Back-casting



Qualitative scenario development - Summary text EcF

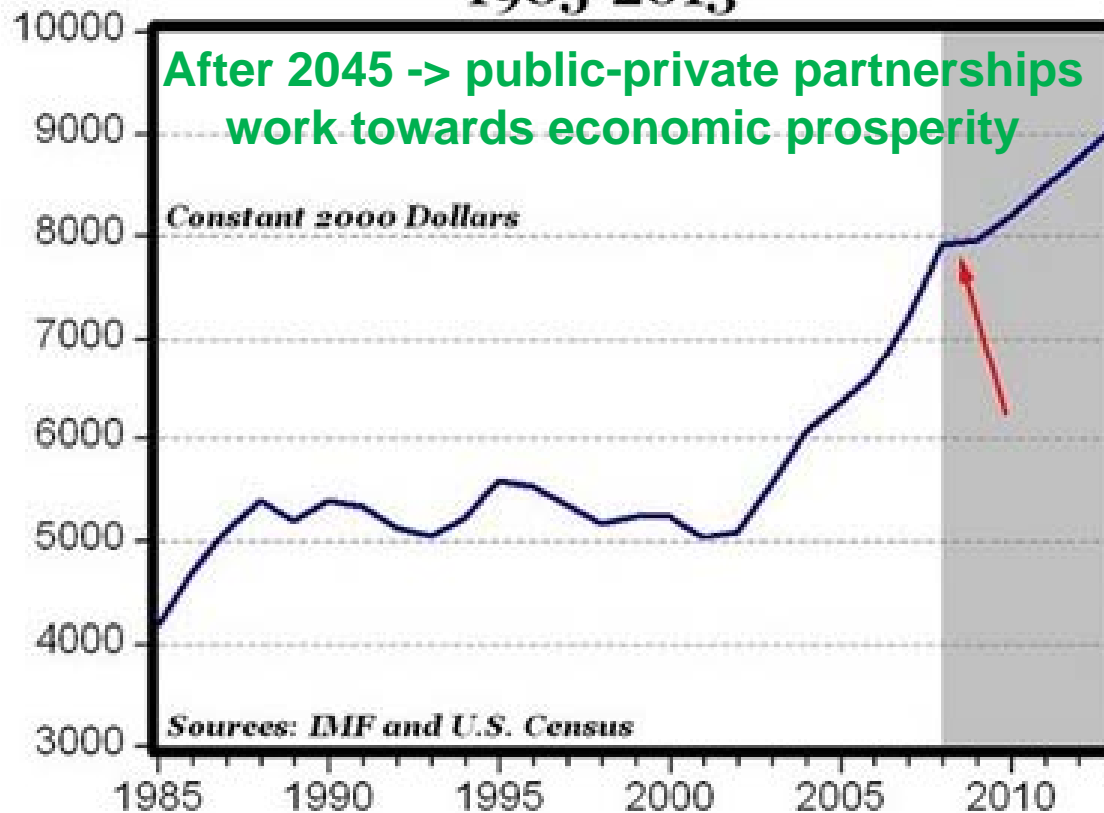


The economy develops towards globalisation and liberalisation so innovations spread but income inequality, immigration and urban sprawl cause social tensions. All energy production alternatives are considered, international consortia are financed to find high-tech alternatives to fossil fuels. Global demand for food and biofuels drives the intensification of agriculture with increasing need for irrigation and new cultivation area. As CAP is weakened farms are abandoned where crop production is uneconomic. Slow diffusion of water-efficient technology, low water-saving consciousness, more single-person households, increase in tourism and lack in training using new irrigation technologies lead to higher water use. Only the higher water prices dampen this trend. It is economic to treat and re-use irrigation return flows thus this practice reducing diffuse pollution is adopted. Water ecosystems providing ecological goods and services for economies and society (e.g. tourism) are preserved and improved. Thus WFD changes its conceptual focus from the good ecological status to preserving socio-economically worth ecological services. Pollution load increases due to curtailed infrastructure, poor treatment and intensified agriculture. Poisoning incidents catch the interest of media and public. Scientific findings and public protests are being heard. Even if governments and European institutions are weak in EcF they are the last straw after recession and social upheaval in 2040s to find a new co-operative balance that lead to foundation of new bodies such as the EU Health Agency.

high-tech
alternatives
fossil fuels

more tourists

World Real GDP Per Capita 1985-2013



diversive i
c
water q

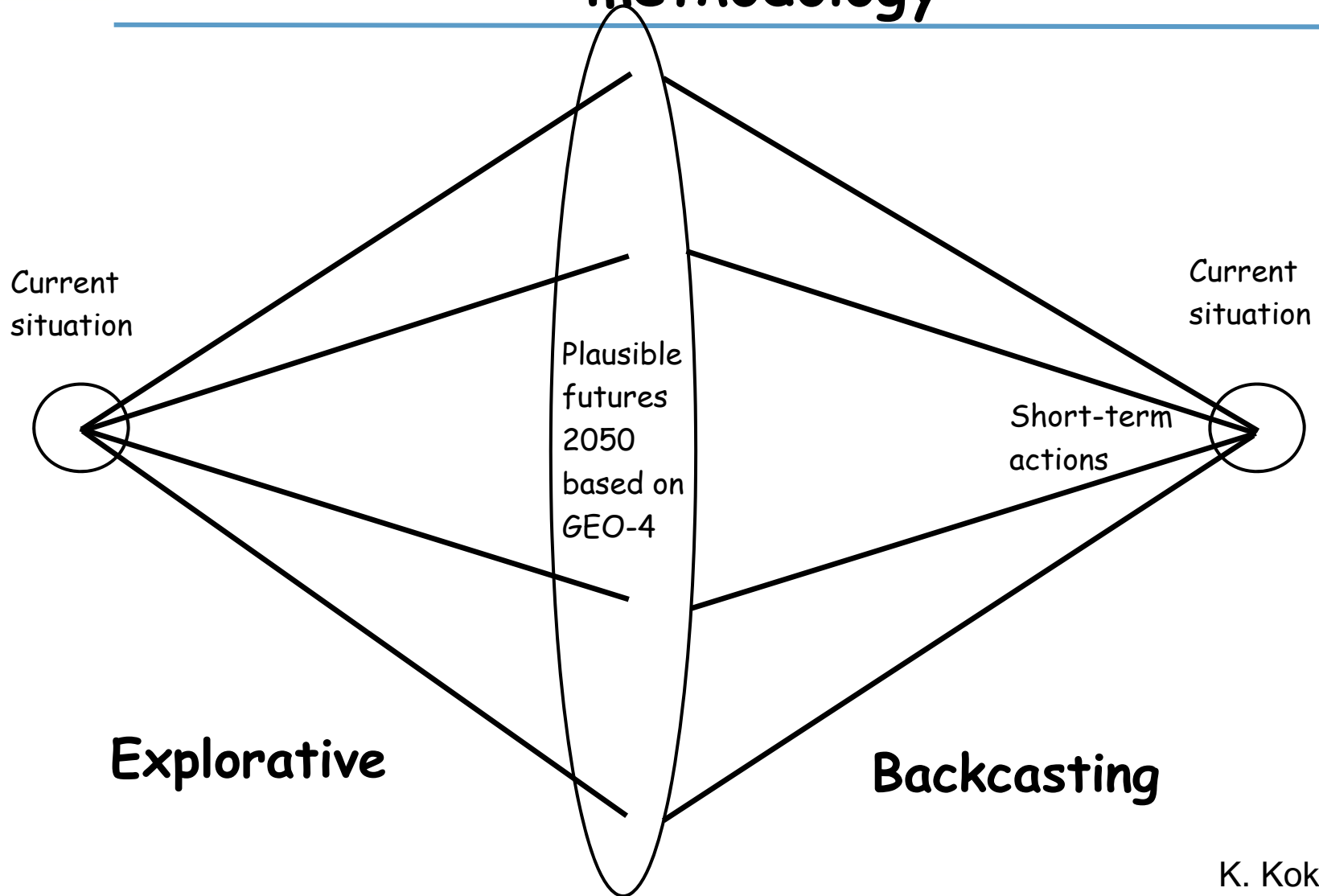
more opportunities
for those that can

slow diffusion of water-efficient
technology, low water-saving
consciousness & higher water prices





Overall qualitative scenario methodology



K. Kok



Analysis of storyline specific items

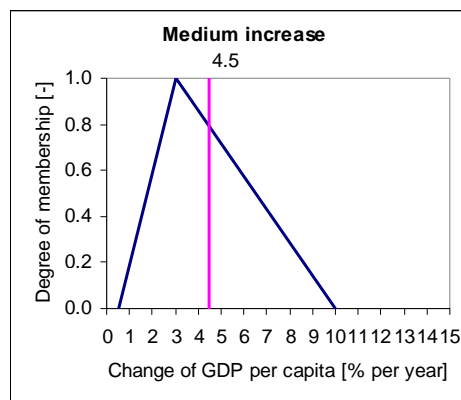


- Strong influence of climate issues
- The balancing act between liberalization (EcF) and governance (PoR)
- The role of WFD
 - eventual compliance (PoR)
 - selective regional compliance (EcF)
 - variable regional compliance & environmental tax (SuE)
 - transformation into "Water Security Framework Directive" (FoE)
- The different views on the strength and expansion of Europe as a unit



Quantification of driving forces

Region	Markets First	
	2005-2025	2025-2050
WE	Medium increase	Low increase
CE	Medium increase	Low increase
EE	Medium increase	Medium to high increase



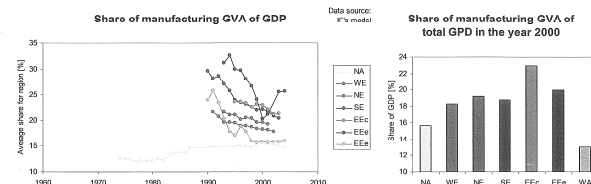
Region	Markets First	
	2005 - 2025	2025 - 2050
WE	+ 4.5	+ 2.3
CE	+ 4.5	+ 2.3
EE	+ 4.5	+ 2.3 - 4.5

Gross Value Added – what will be the share of manufacturing industry of total GDP

	NA	WE	NE	SE	EEc	EEe	WA
2025	l	m	m	m	m	h	l
2050	l	m	m	m	m	m	l

What is the share?
Please fill in - high = h; medium = m; low = l

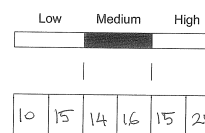
Figure 3. Share of manufacturing industry output of GDP 1960-2002 and in 2000 in the regions⁷.



Target year manufacturing GVA per total GDP
What will be the share of manufacturing GVA (Gross Value Added) of total GDP in the future?

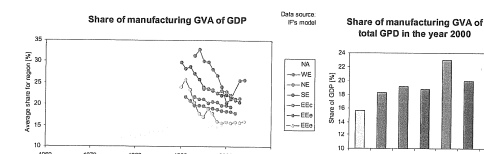
Please give your best estimate.

Manufacturing GVA of total GDP. Please define the boundaries for the share for high, medium and low!



OVERLAPPING OF CLASSES POSSIBLE!

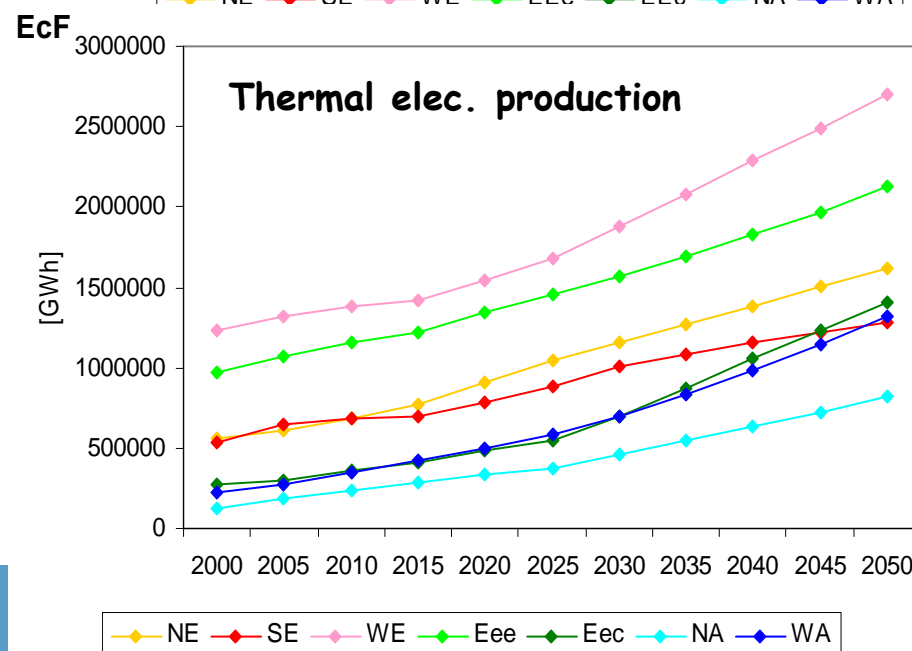
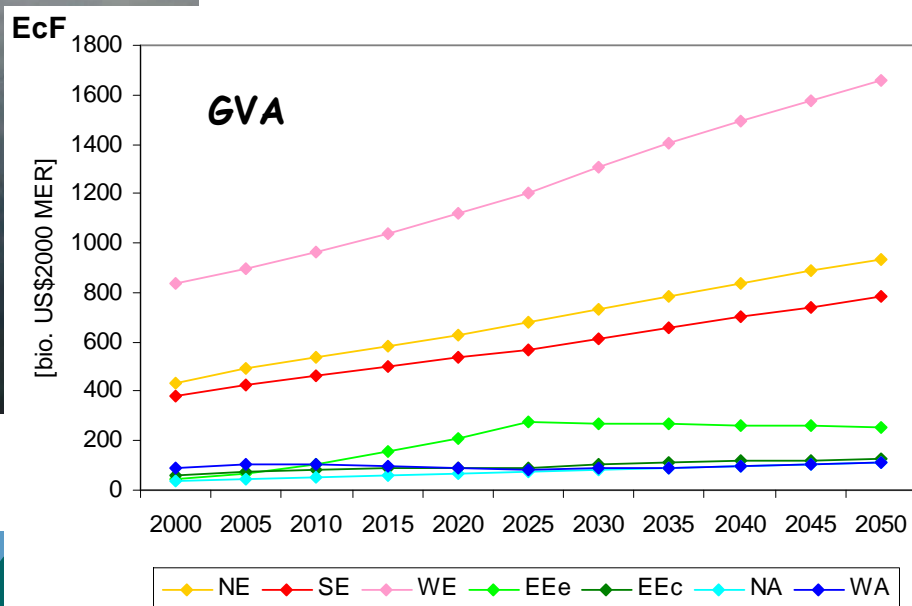
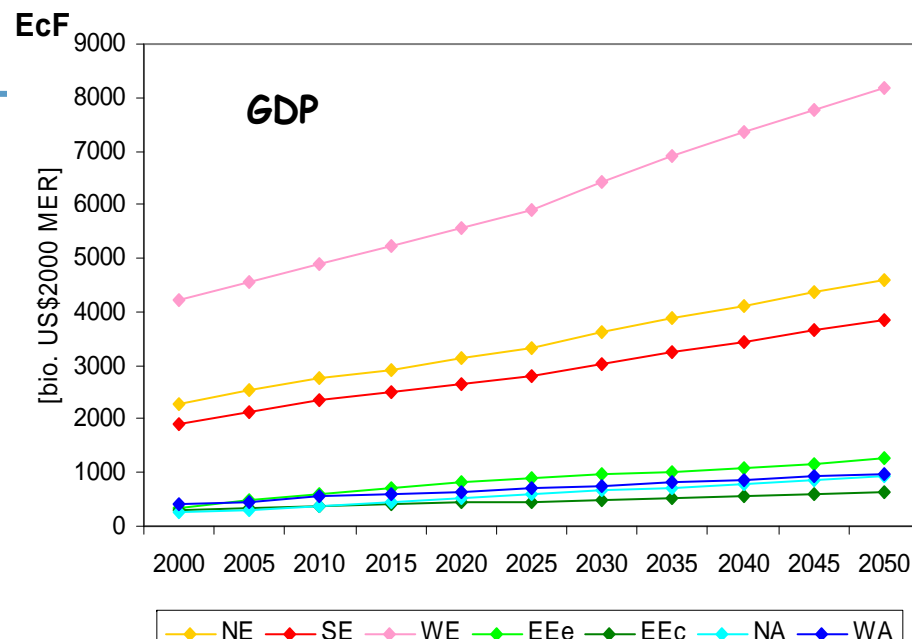
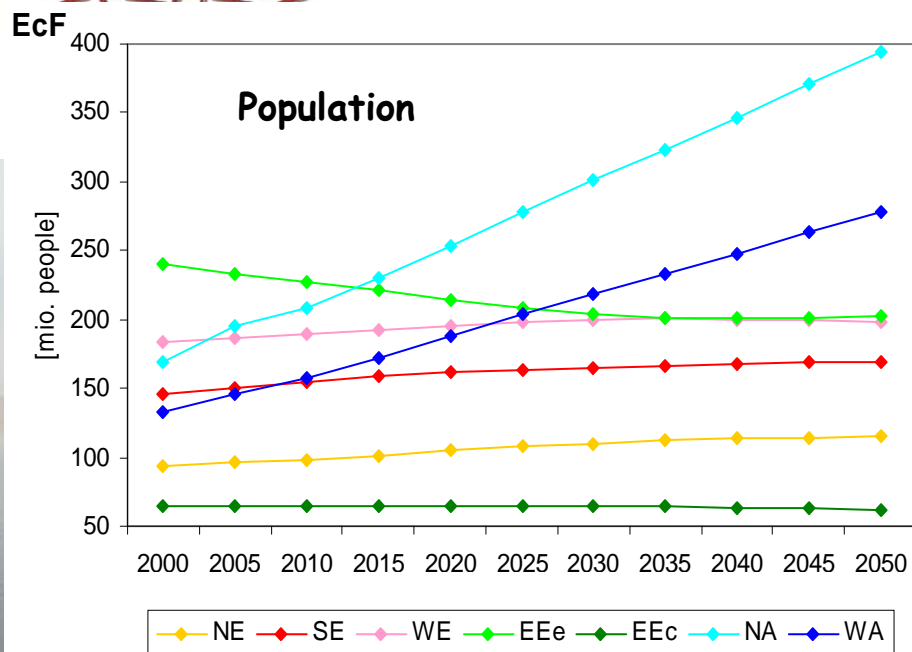
Figure 3. Share of manufacturing industry output of GDP 1960-2002 and in 2000 in the regions.







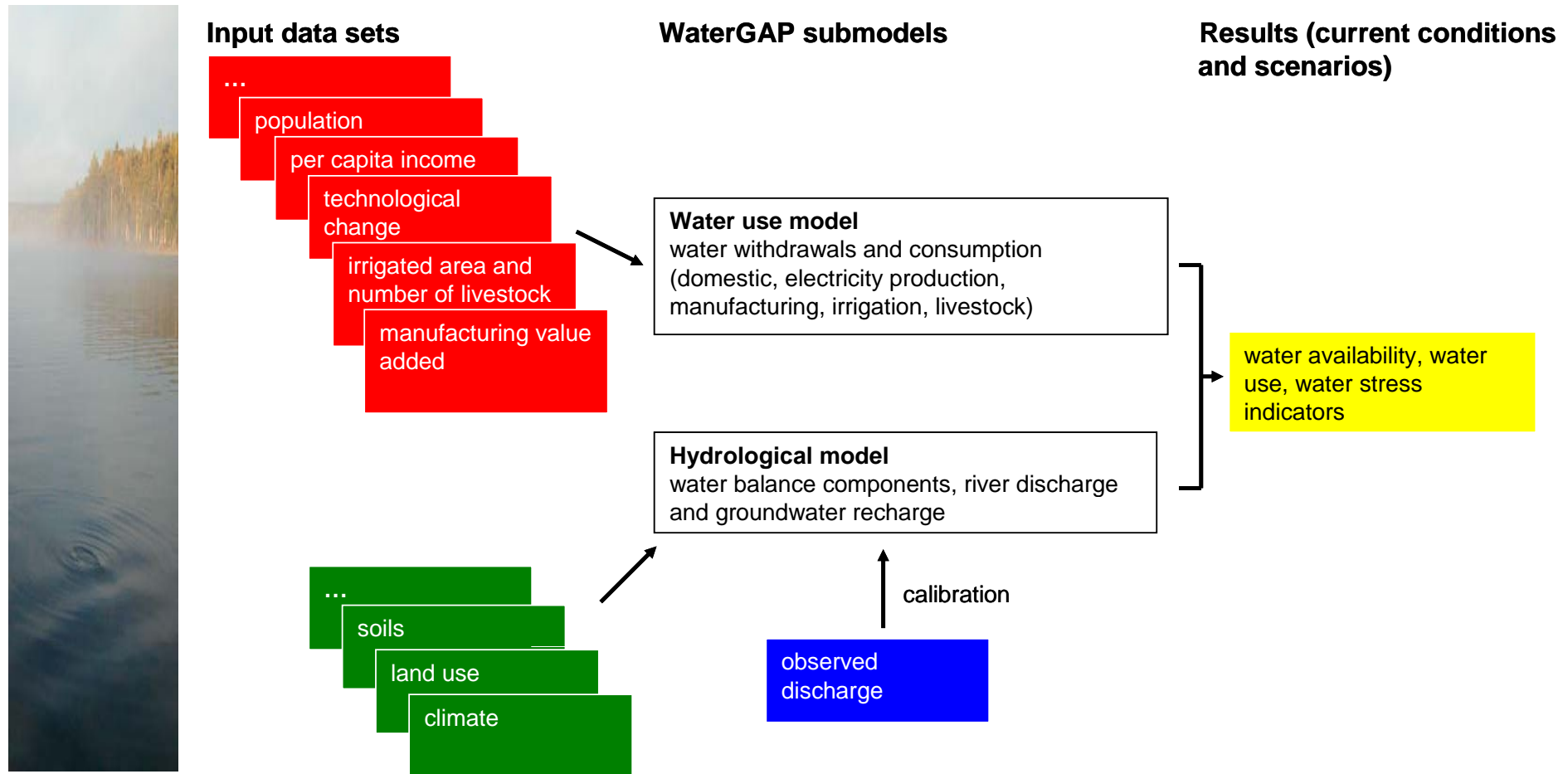
Main drivers EcF





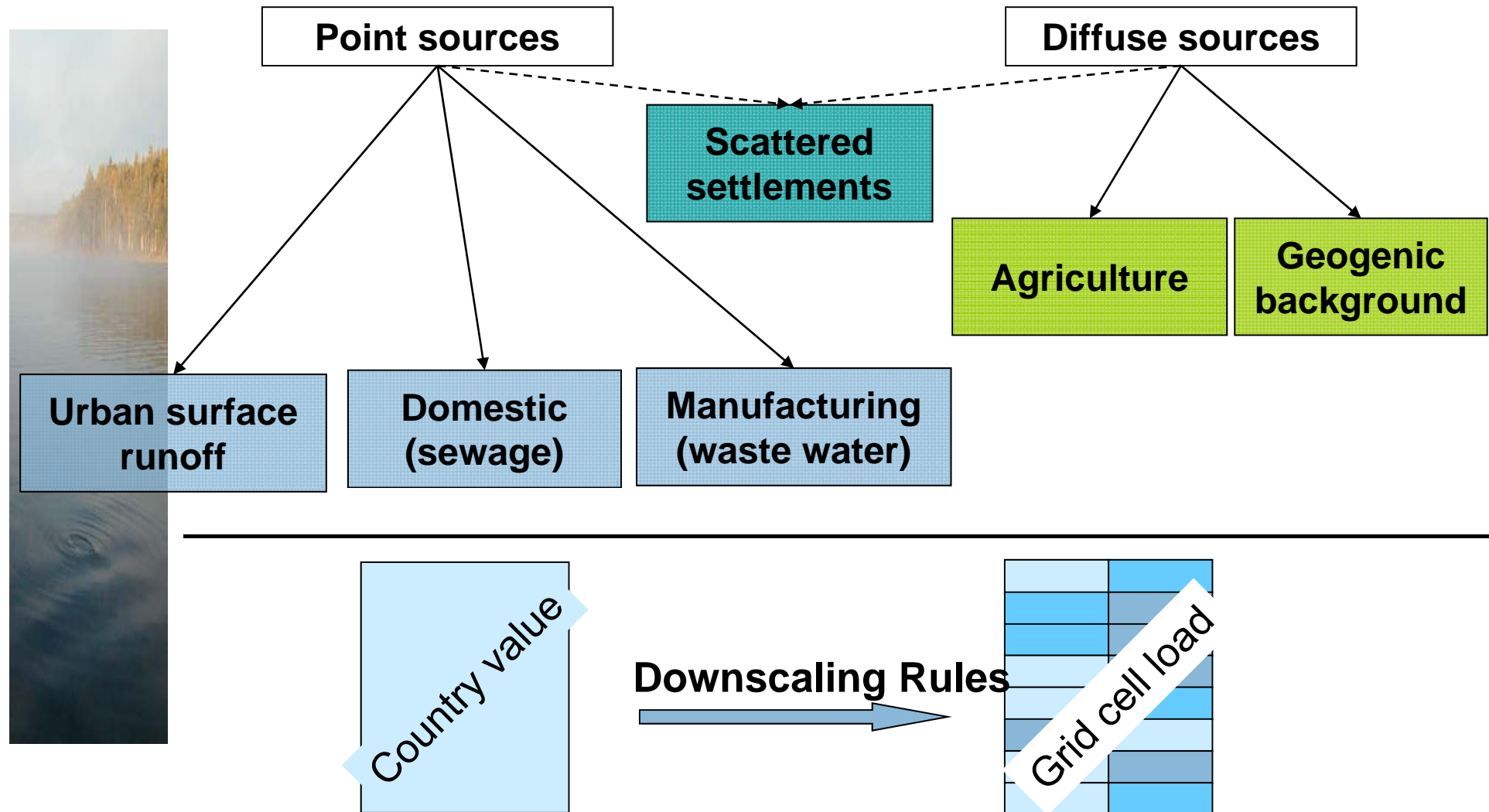
Modelling tool: WaterGAP 3

(Water - Global Assessment and Prognosis)





Water quality - Modelling approach for pollutant loads





Climate Change

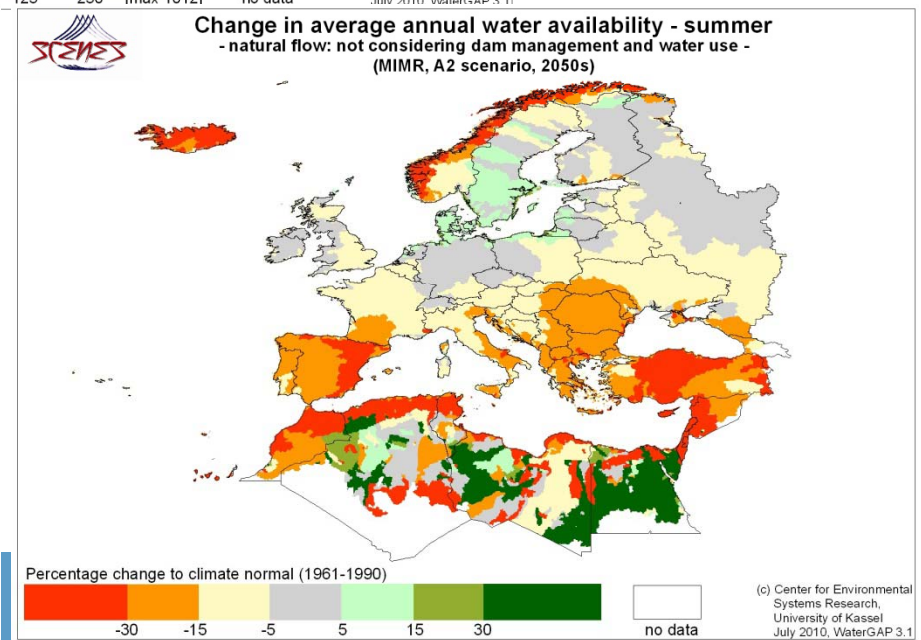
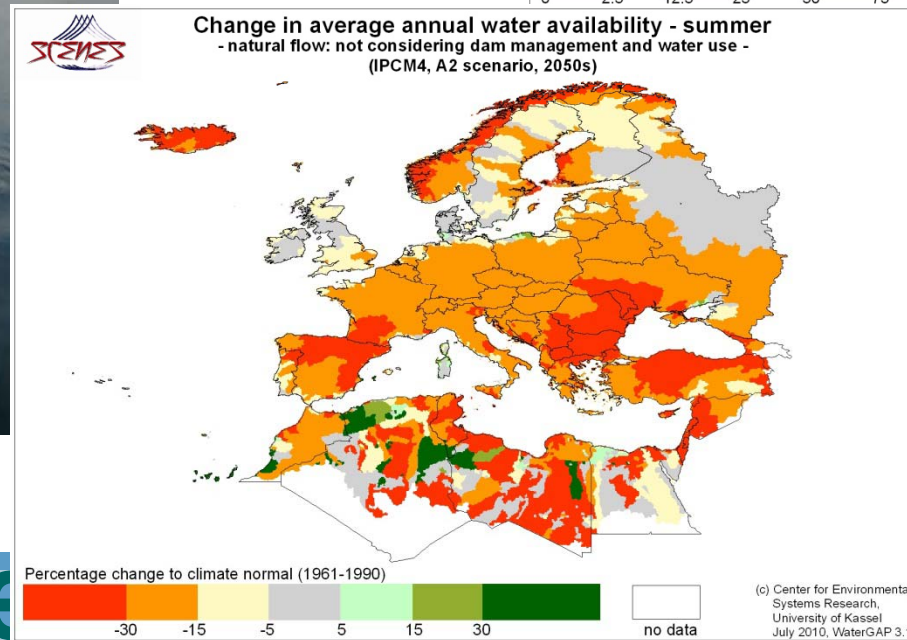
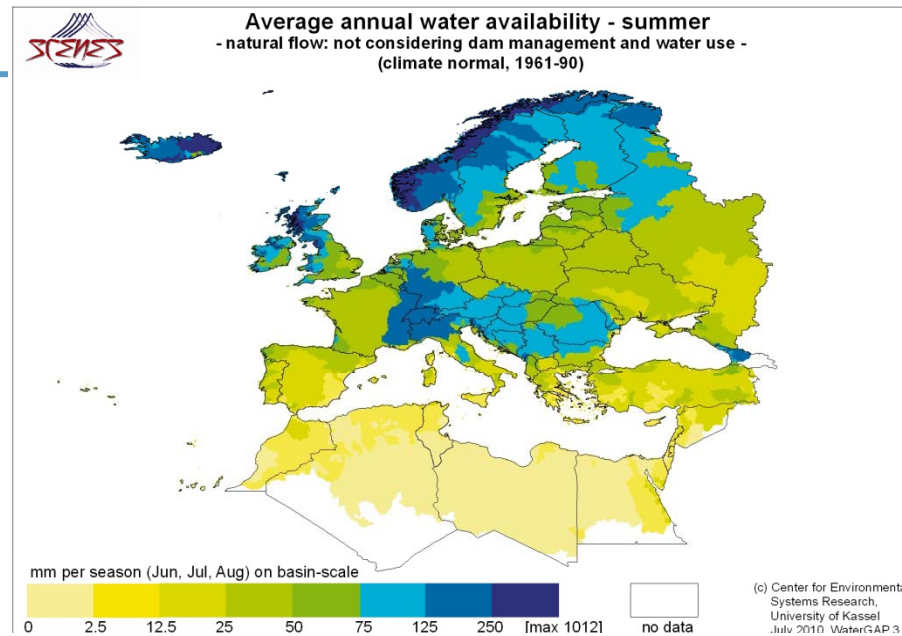


Input

- IPCM4-A2: IPSL-CM4 model, Institute Pierre Simon Laplace, France; A2 emission scenario, warm and dry ($T_{\text{Europe}} = 0.89^{\circ}\text{C} - 7.93^{\circ}\text{C}$)
- MIMR-A2: MICRO 3.2, Center for Climate System Research, University of Tokyo, Japan; A2 emission scenario, warm and wet ($T_{\text{Europe}} = 1.18^{\circ}\text{C} - 7.48^{\circ}\text{C}$)

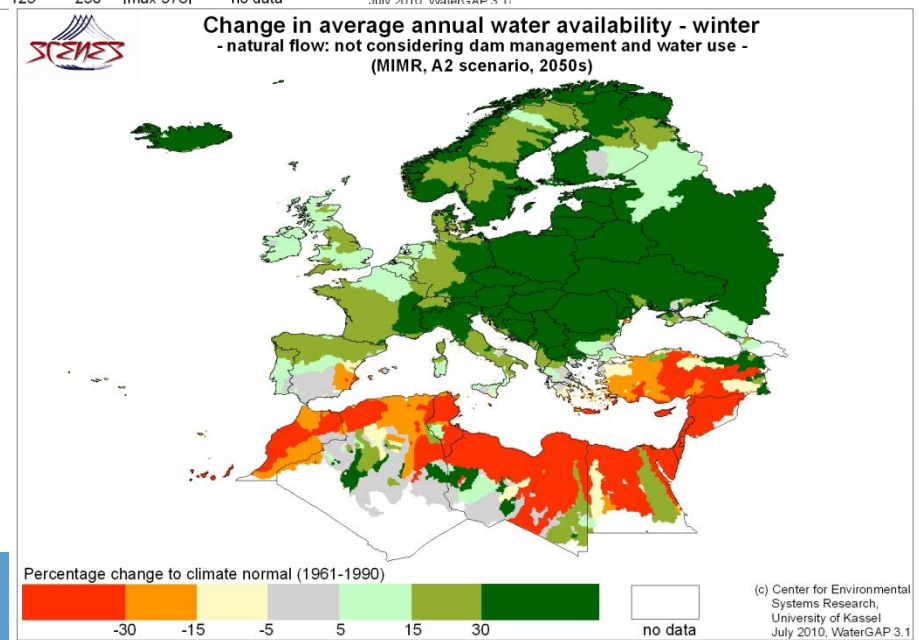
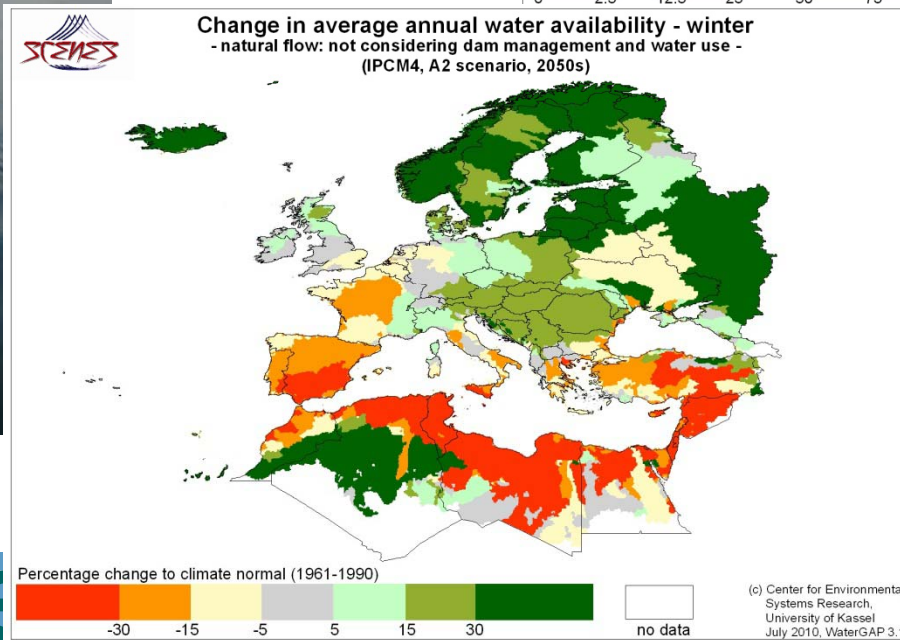
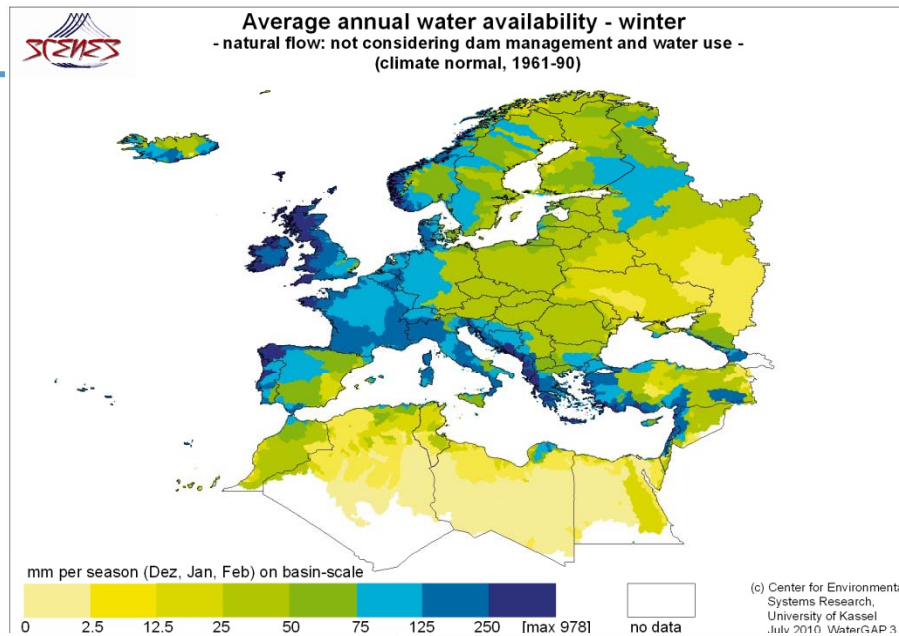


Water availability - summer

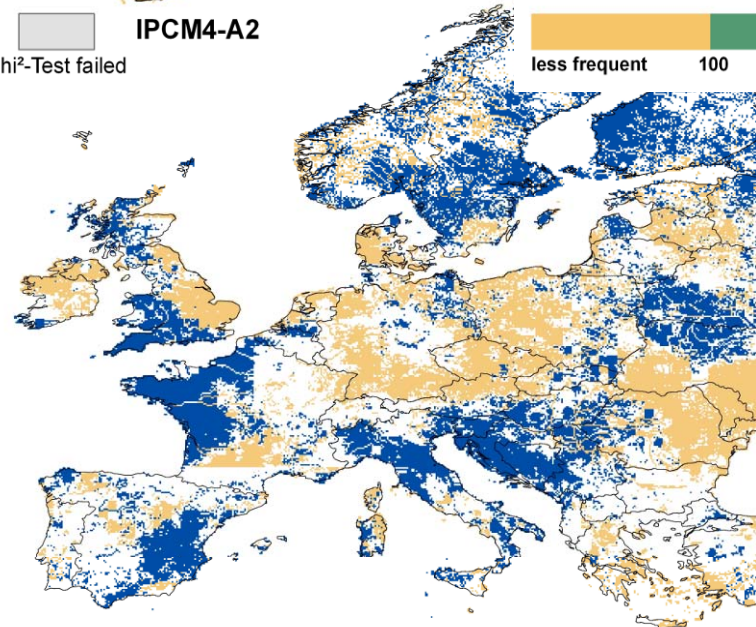
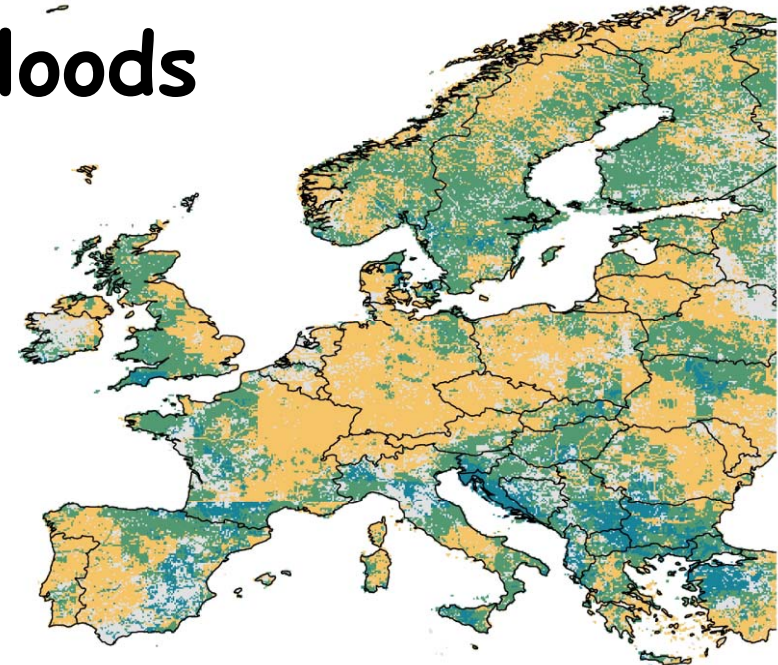
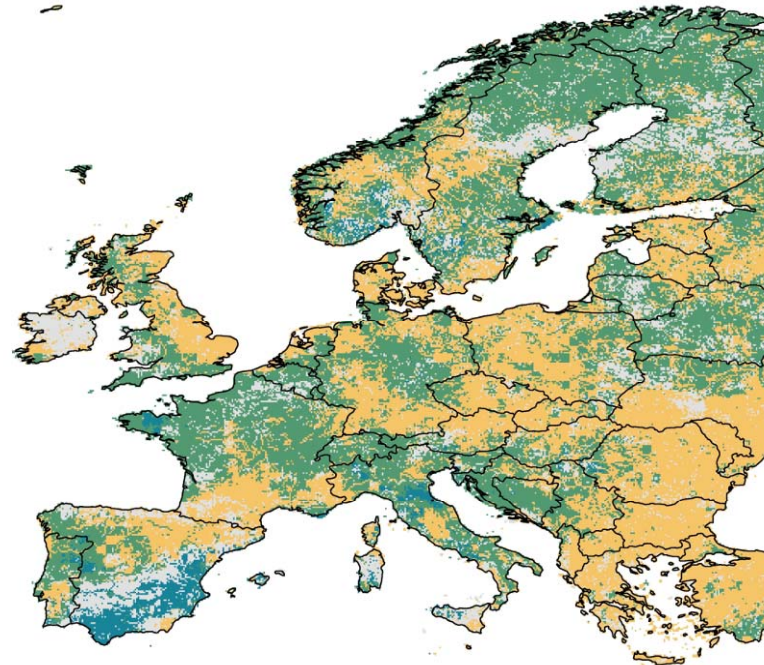




Water availability - winter

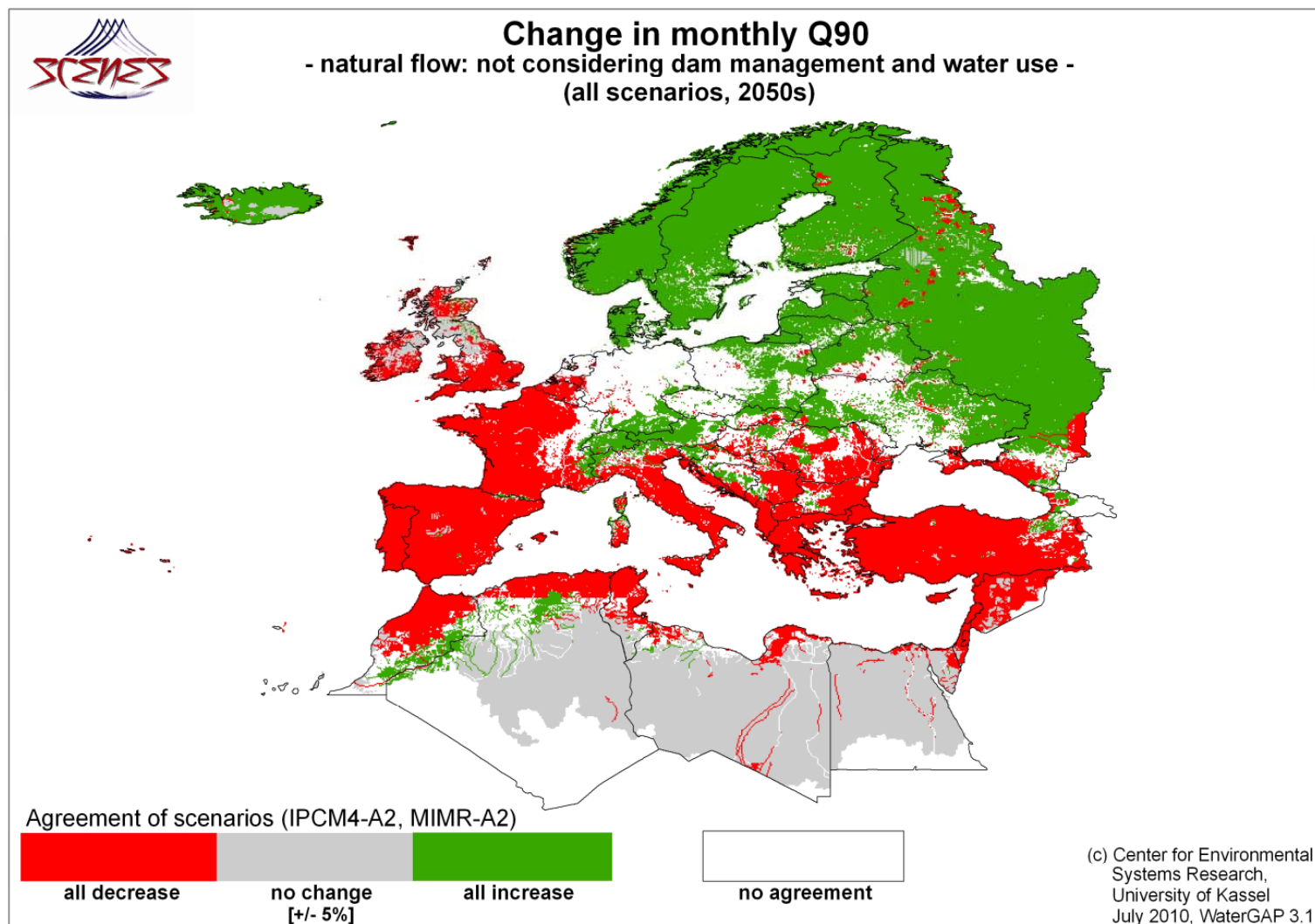


Floods





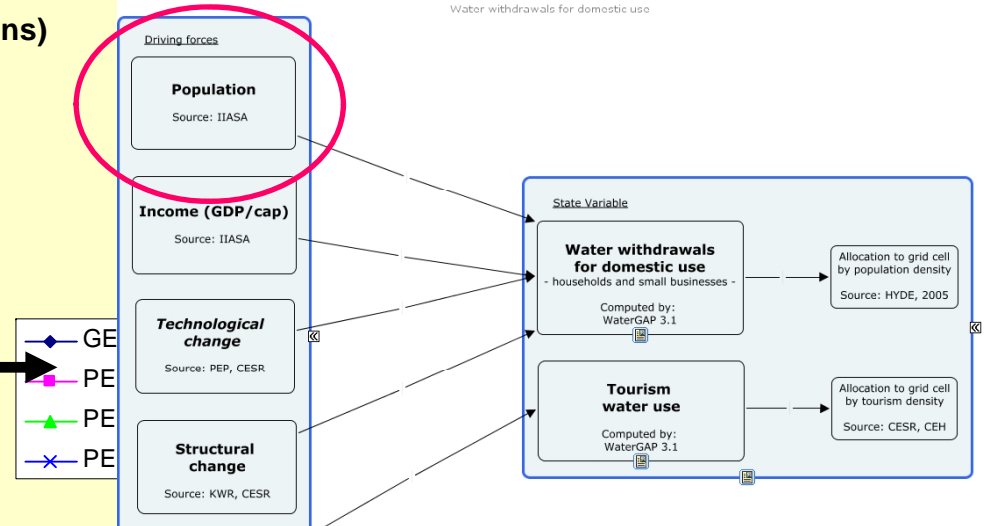
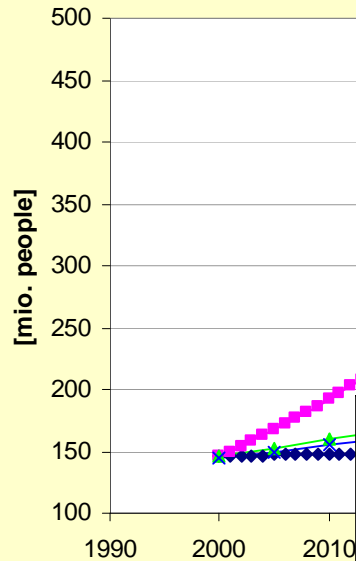
Low flow



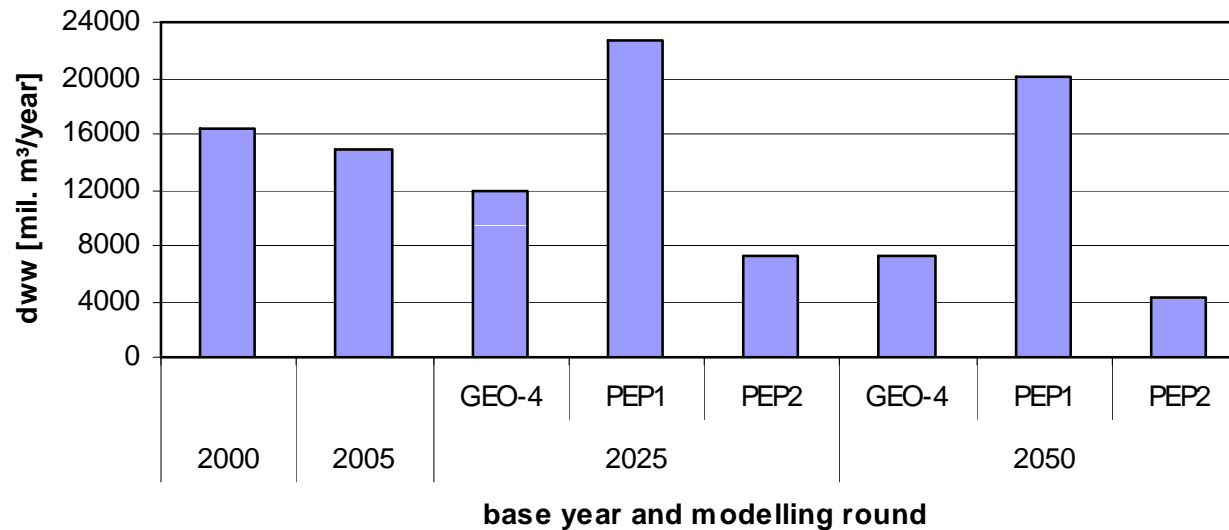


Iterative steps

Population - Southern Europe (def. UN World Regions)
Scenario: Policy First/Rules



Domestic water use in Policy First / Policy Rules scenario
Southern Europe

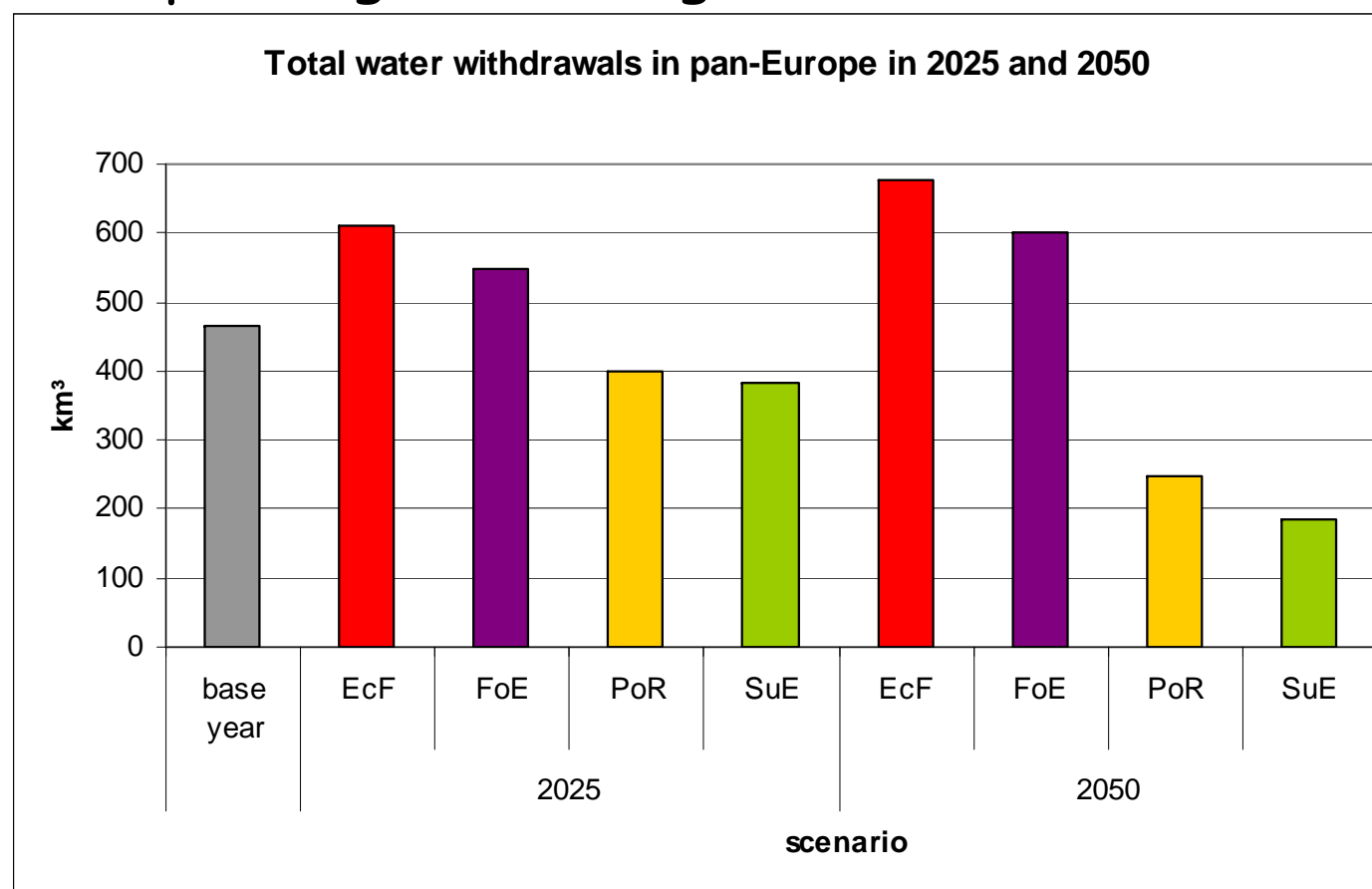




Water withdrawals

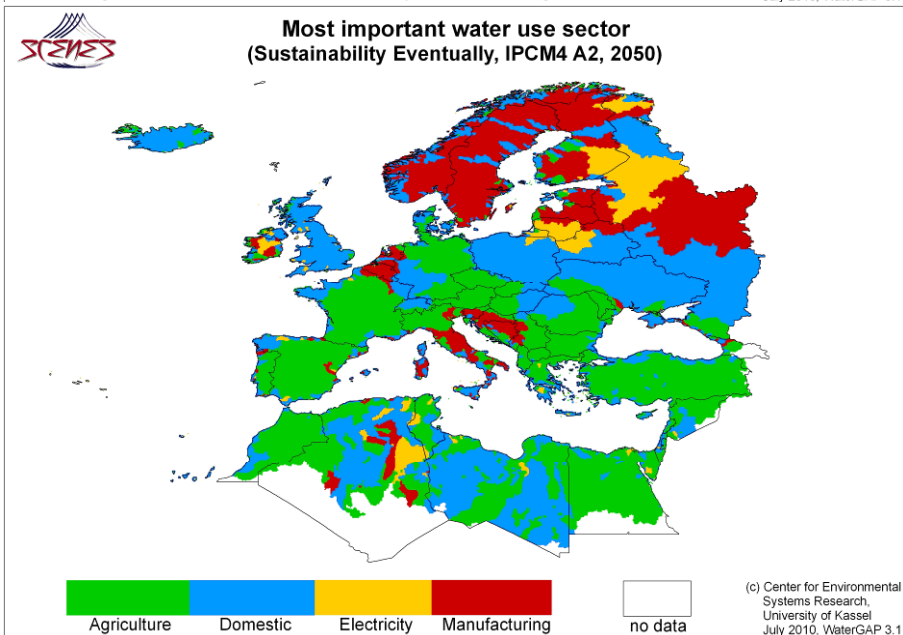
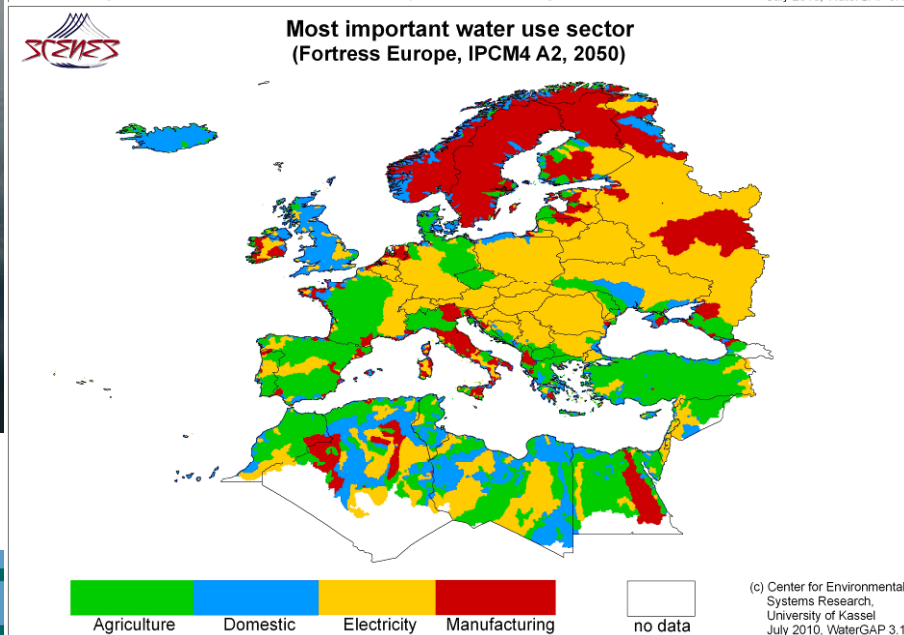
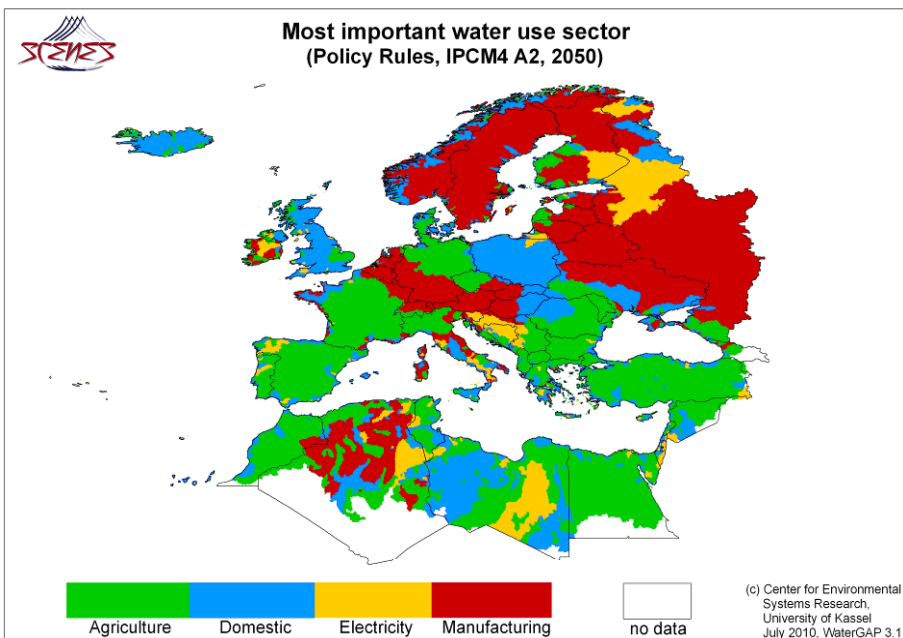
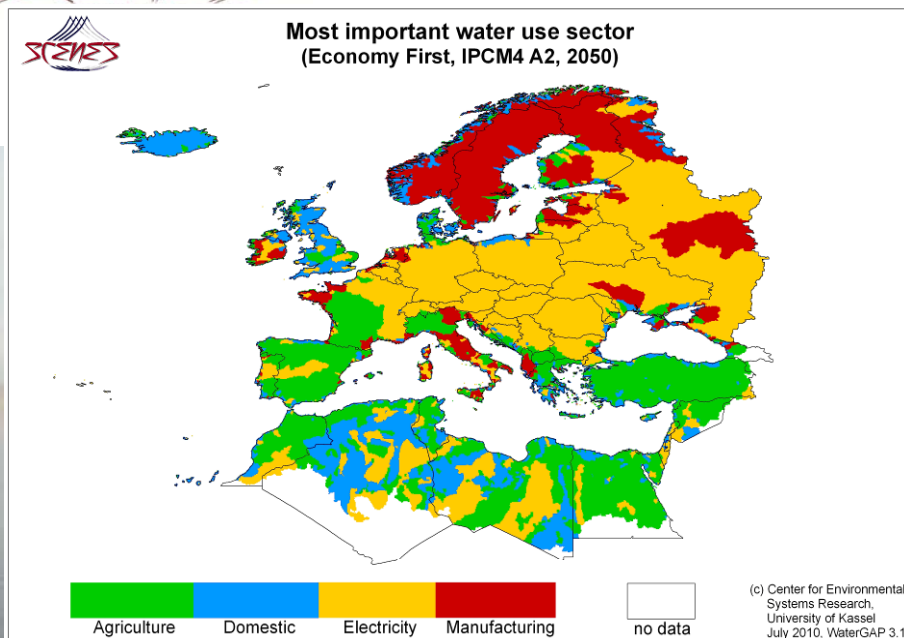
Water uses are expected to increase or decrease!

Depending on the region and on the scenario.



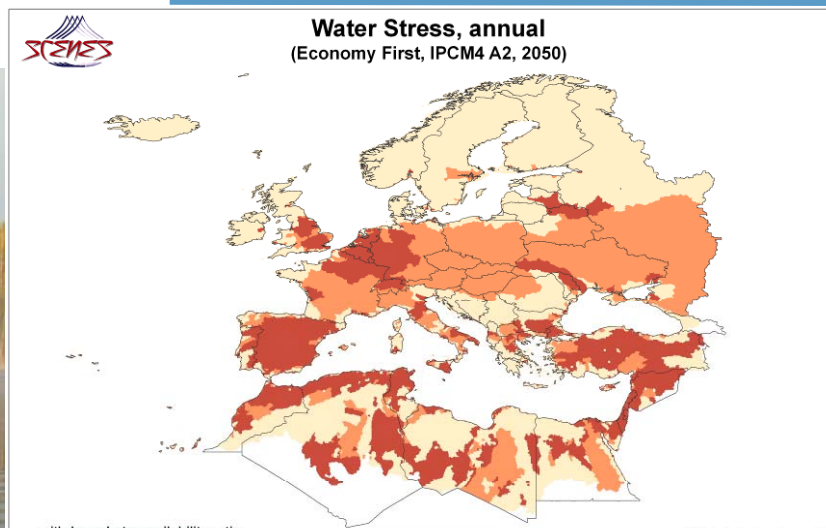


Most important water use sector

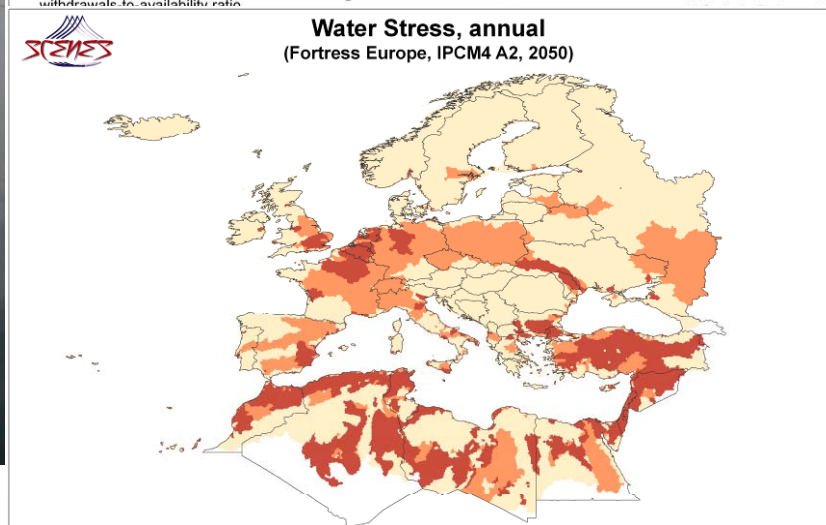




Water stress



withdrawals-to-availability ratio

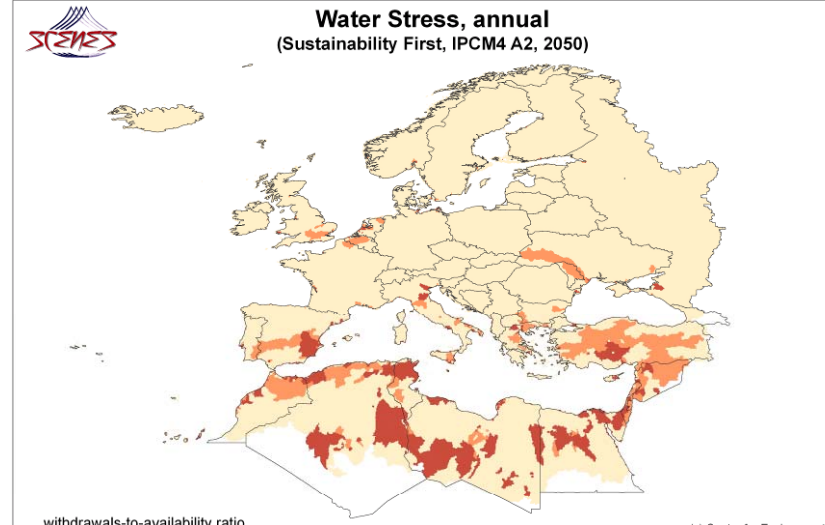
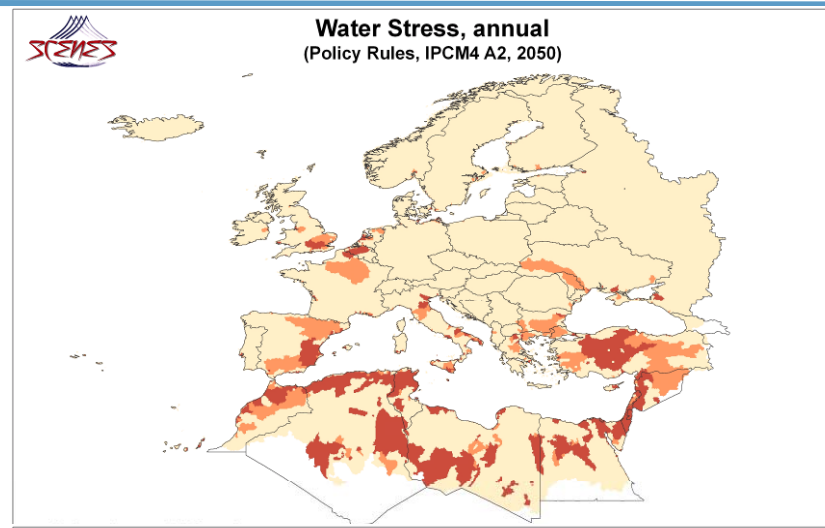


withdrawals-to-availability ratio

0 - 0.2 0.2 - 0.4 more than 0.4
[low water stress] [mid water stress] [severe water stress]

no data

(c) Center for Environmental
Systems Research,
University of Kassel,
July 2010 - WaterGAP 3.1



withdrawals-to-availability ratio

0 - 0.2 0.2 - 0.4 more than 0.4
[low water stress] [mid water stress] [severe water stress]

no data

(c) Center for Environmental
Systems Research,
University of Kassel,
July 2010 - WaterGAP 3.1



Key findings & lessons learnt



1. Stakeholder participation valuable in scenario development but not straight forward! Time dilemma!
2. Qualitative and quantitative scenarios can be coupled through the SAS approach! Analysis of (in)consistencies!
3. Linking existing climate scenarios to new "pan-European socio-economic scenarios" requires good arguments!
4. Water stress due to climate change and increased water uses! Increased water withdrawals lead to increasing in-stream concentrations!
5. Sectoral profile of water use is expected to change!
6. Increasing awareness and more efficient use of water reduce water abstraction!
7. Global water quality modelling suitable for scenario comparison (e.g. climate vs. socio-economic changes)

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Welcome to the SCENES Webservice

This is a web based interface to access results from the **SCENES** project on qualitative and quantitative scenarios. In the first phase of the project (years 2006-2008), work is based on [UNEP's](#) GEO-4 'Global Environment Outlook' scenarios. Through this interface you can access maps and charts describing both the driving forces like GDP per capita and population growth rate and results in form of e.g. water availability and water use.

[Read more ...](#)

The **SCENES** project "**Water Scenarios for Europe and for Neighbouring States**" is a 4-year research project that started in late 2006. The aim is to develop and analyze a set of comprehensive scenarios of Europe's freshwater futures up to 2025. The project area covers all of "Greater" Europe reaching to the Caucasus and Ural Mountains, and including the Mediterranean rim countries of north Africa and the near East.

[Read more ...](#)



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