Congress Portuguese Water Resources Association

Estoril – Portugal, 4 April 2008

Water – the key to adapt to Climate Change

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Content

- Introduction
- Climate change impacts on European waters
- EU water policy and adaptation
- Challenges for Adaptation White Paper
- Additional information

- NB: This presentation does <u>not</u> cover adaptation issues outside the EU

Climate Change impacts on Water - 1

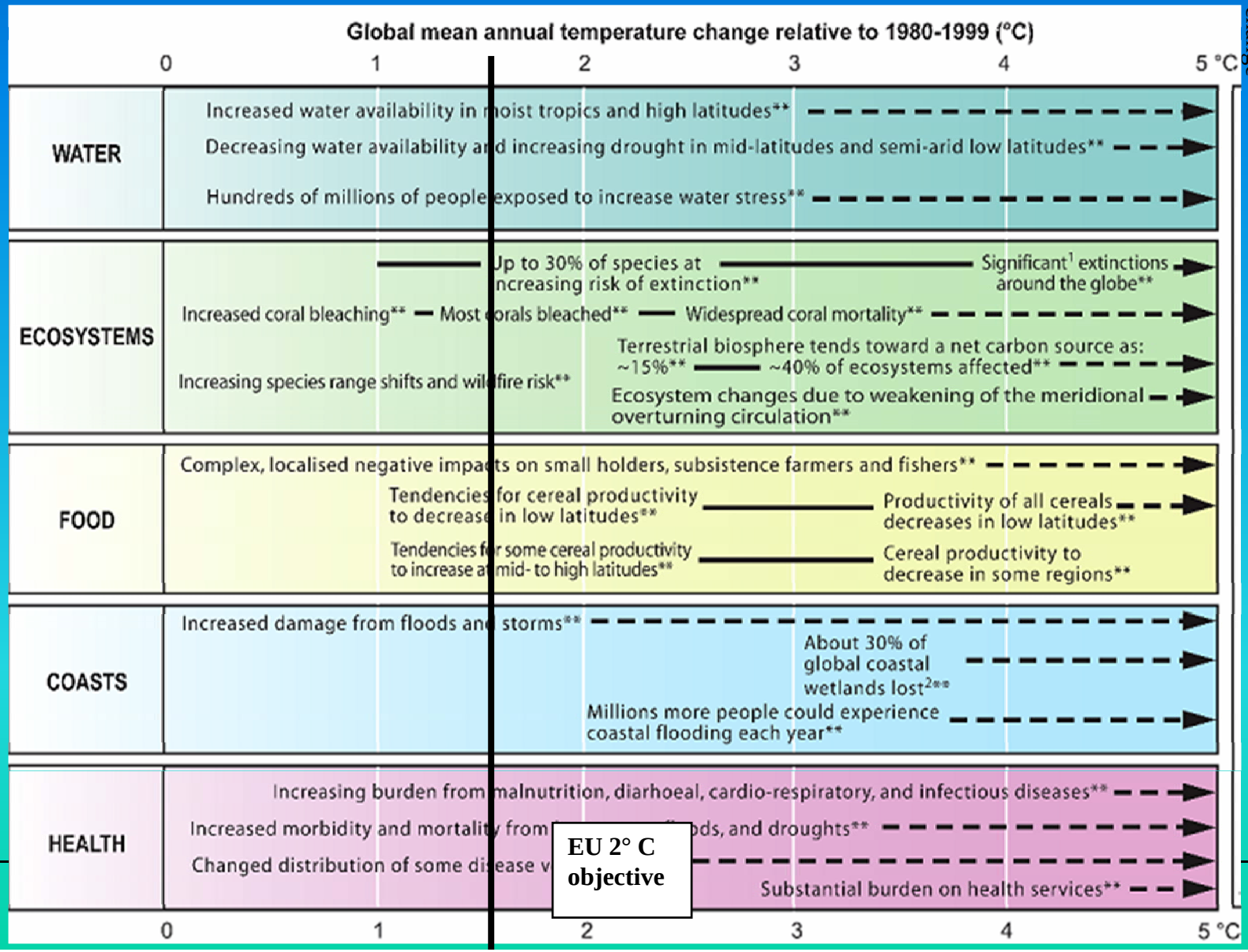
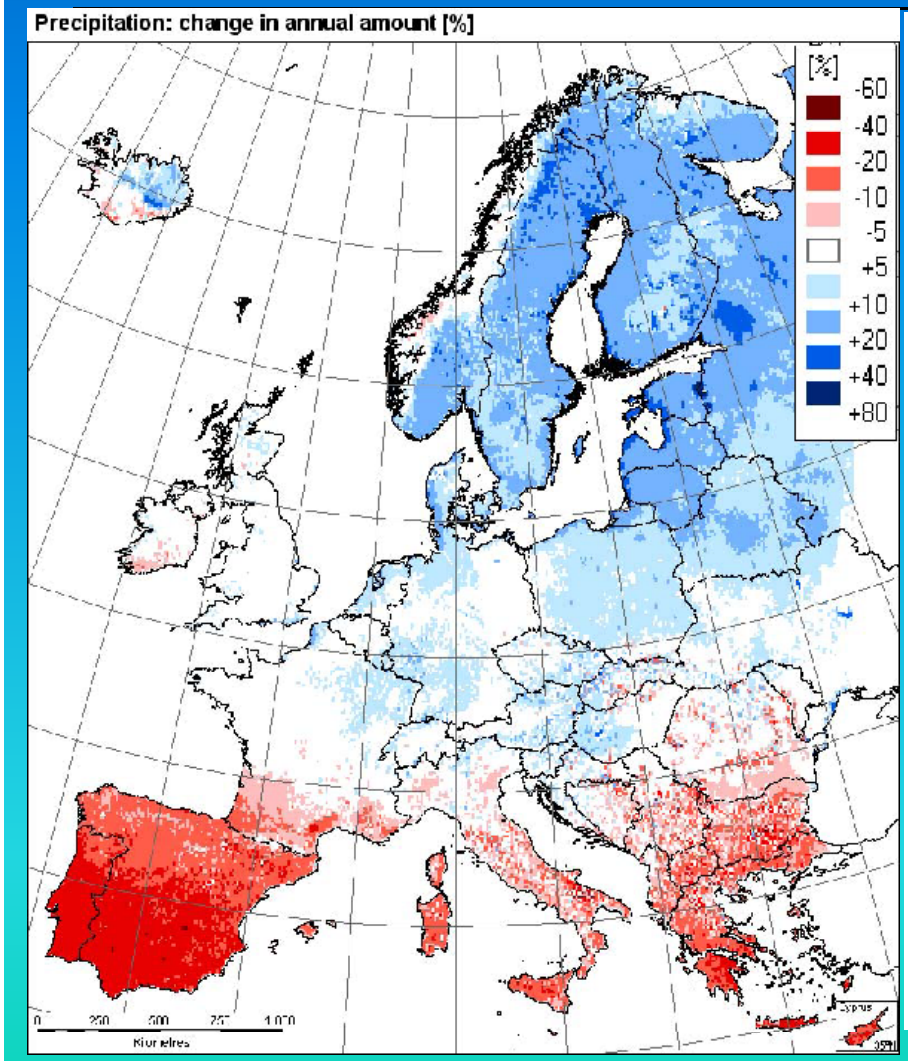
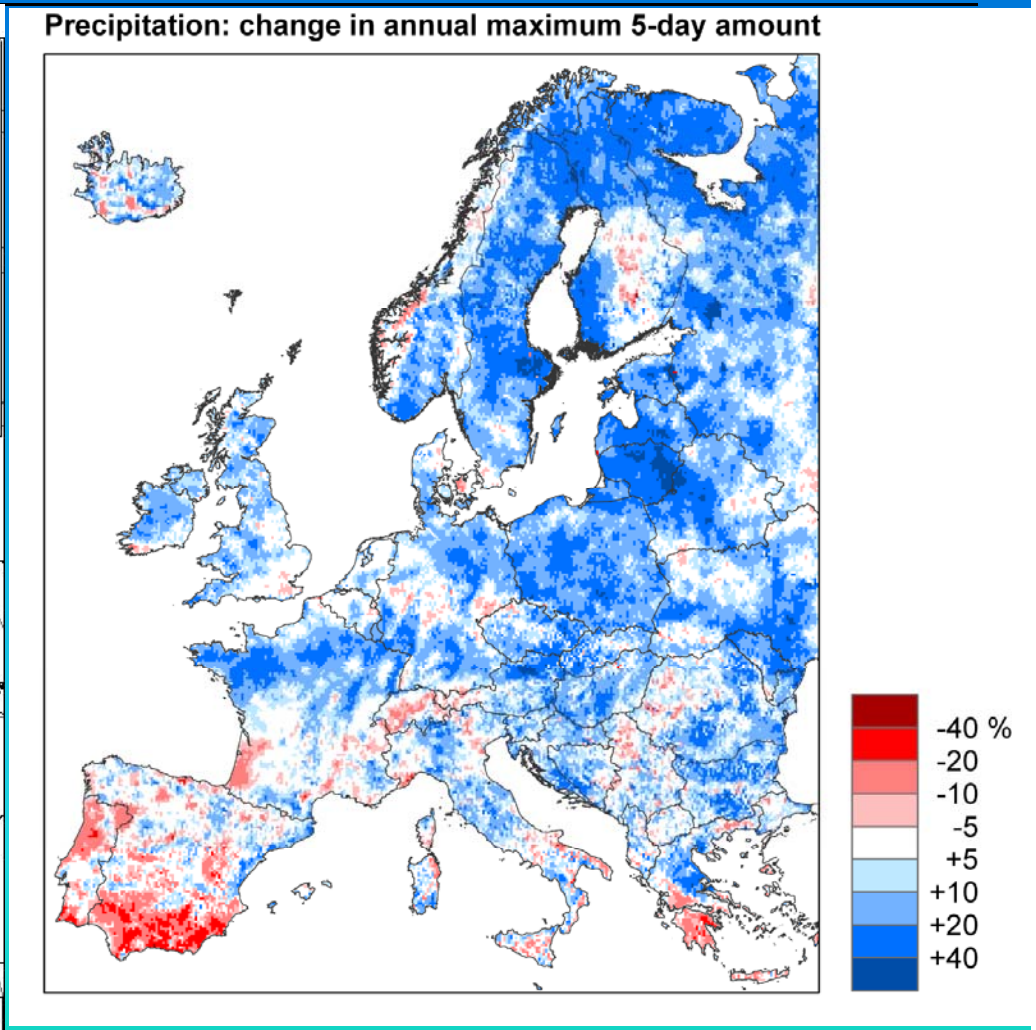


Figure 3: Key impacts as a function of increasing global average temperature change[1]

1Above 1980-1999 levels. To express the change relative to the period 1850-1899, IPCC WG II adds 0.5 degrees C

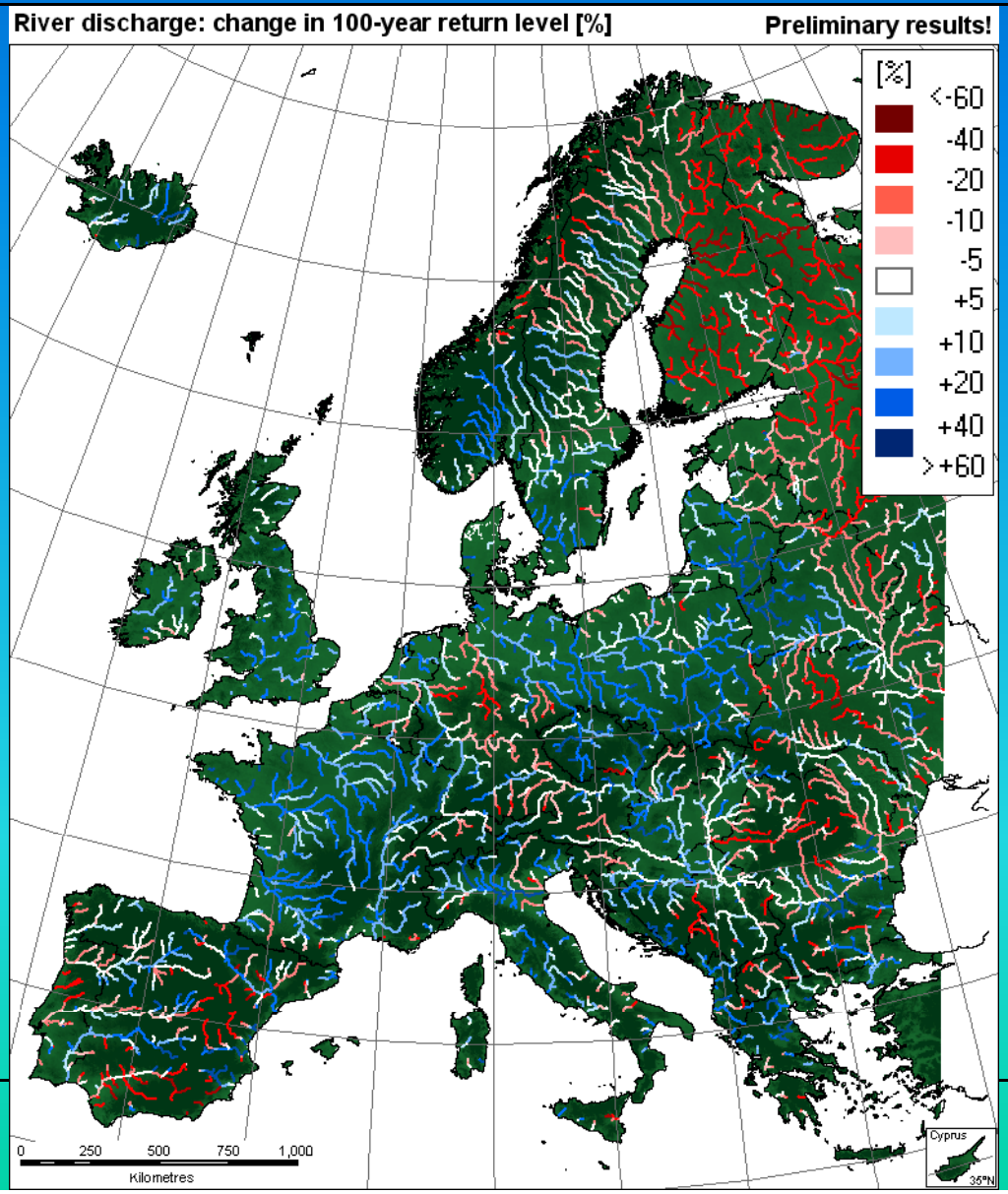
Climate Change impacts on Water - 2





Source: PESETA project, PRUDENCE; IPCC SRES A2 high emission scenario (change 2071-2100 relative to 1961-1990)

Climate Change impacts on Water - 3

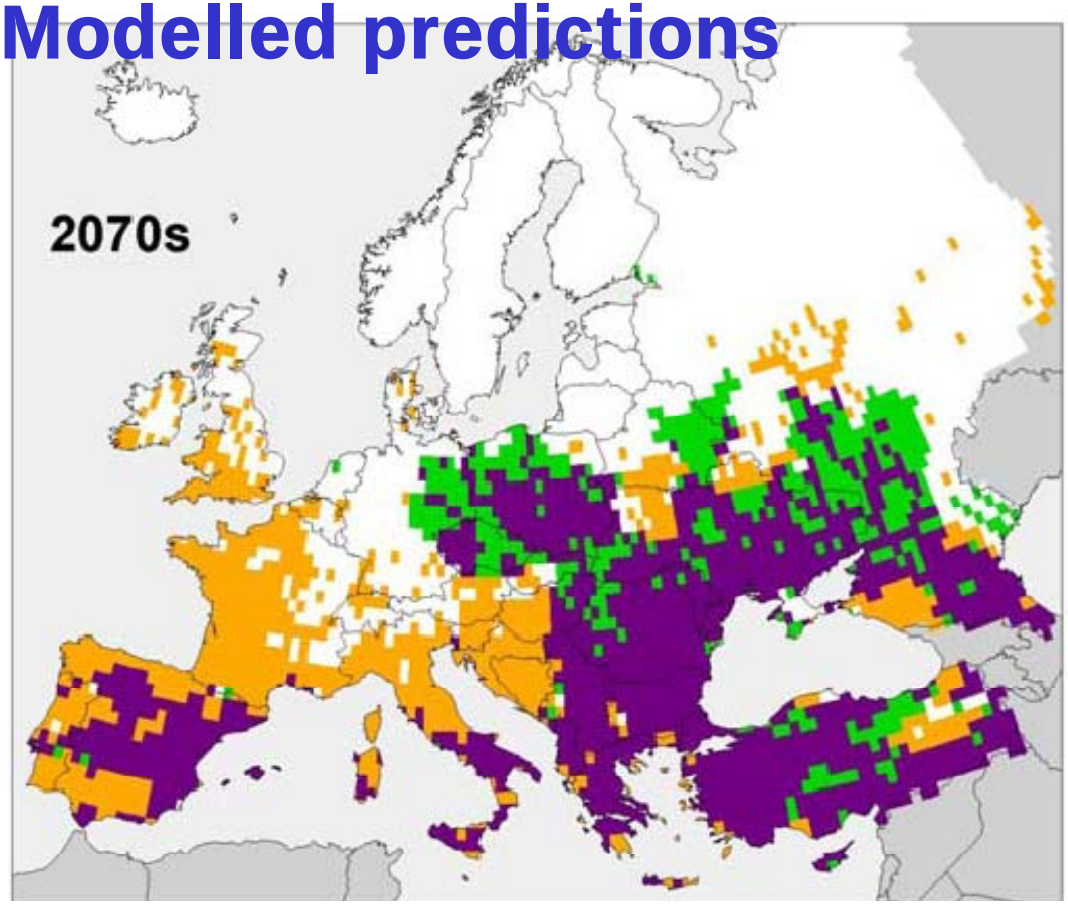


Projected changes in river discharge (decrease in southern/eastern, increase in northern/central Europe)

Source: PESETA project, PRUDENCE; IPCC SRES A2 high emission scenario (change mean 2071-2100 relative to 1961-1990)

Climate Change impacts on water - 4

Modelled predictions



Today's 100-year droughts return every 50 years (or more frequent)

Today's water stress increases by 10% and future w.t.a ratio exceeds 0.4

Both above drought and stress criteria are met

(c) Center for Environmental Systems Research, University of Kassel, June 2001

Expected impacts of climate change and economic development

-Proportion of severe water stress EU river basins likely to increase from 19% today to 35% by 2070.

-Areas affected by droughts will increase.

-If t° rises by 2 to 3°C, water scarcity would affect 1.1 to 3.2 billion people

Climate Change impacts on Water - 5

Combined effects of demand development and climate change: Water stress today and in 2070

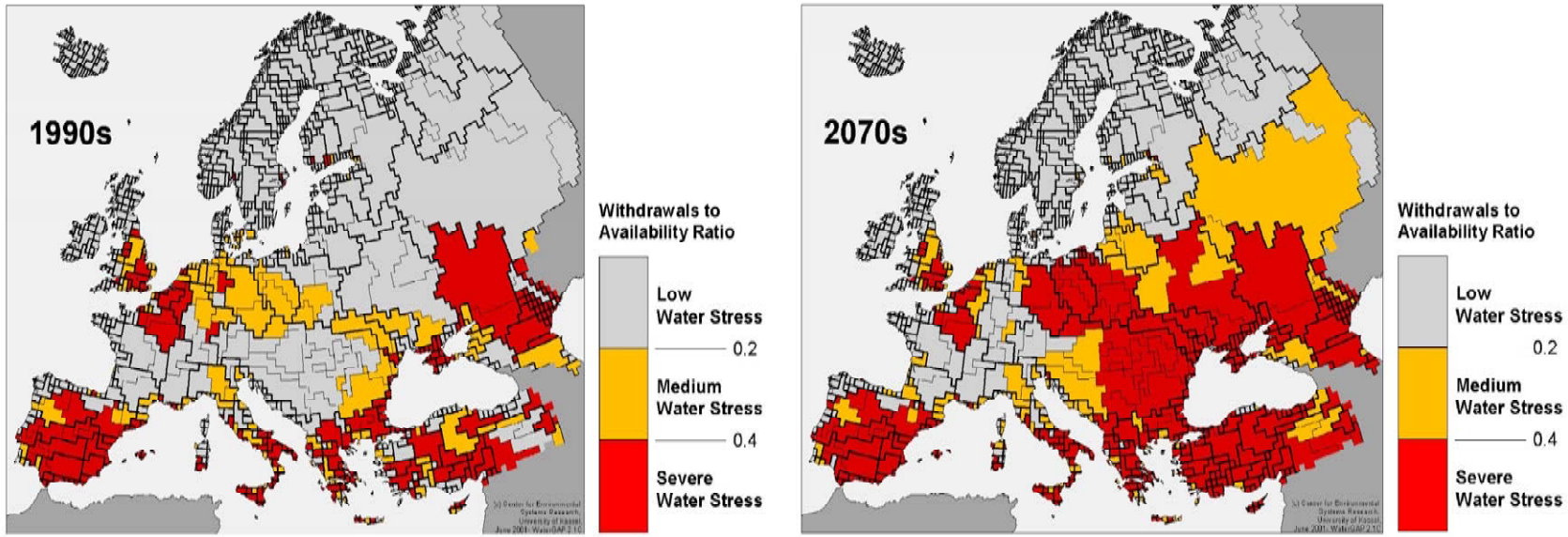


Figure 5.2: Water stress in Europe for today's situation. Water stress is defined by the withdrawals-to-availability ratio.

Figure 5.6: Water stress in Europe in the 2070s under the Baseline-A scenario (with climate data of HadCM3). Water stress is defined by the withdrawals-to-availability ratio.

Source: Eurowasser study, University of Kassel

Climate Change impacts on Water - 6

Combined effects of demand development and climate change: change in magnitude of 100-year drought

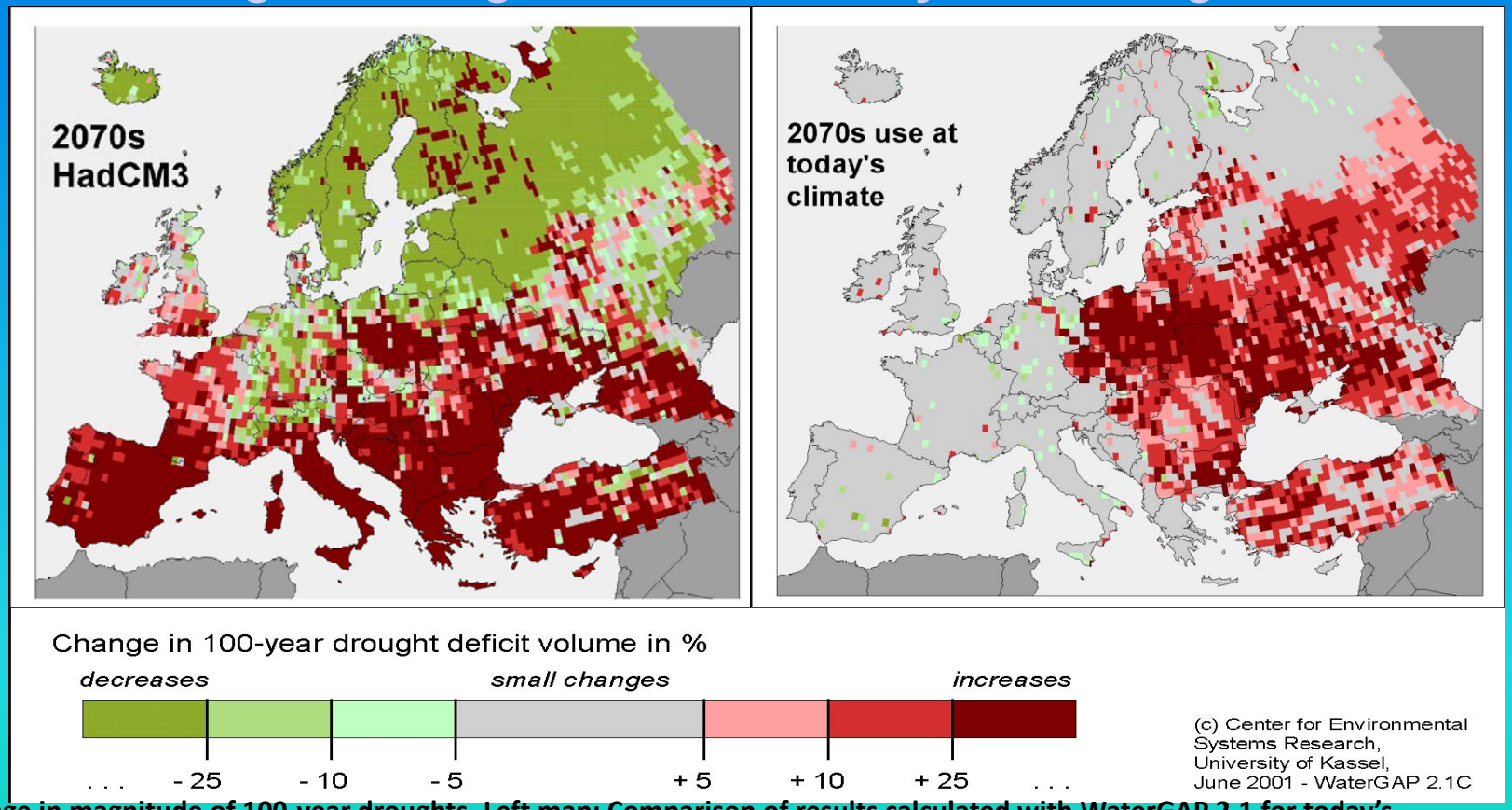
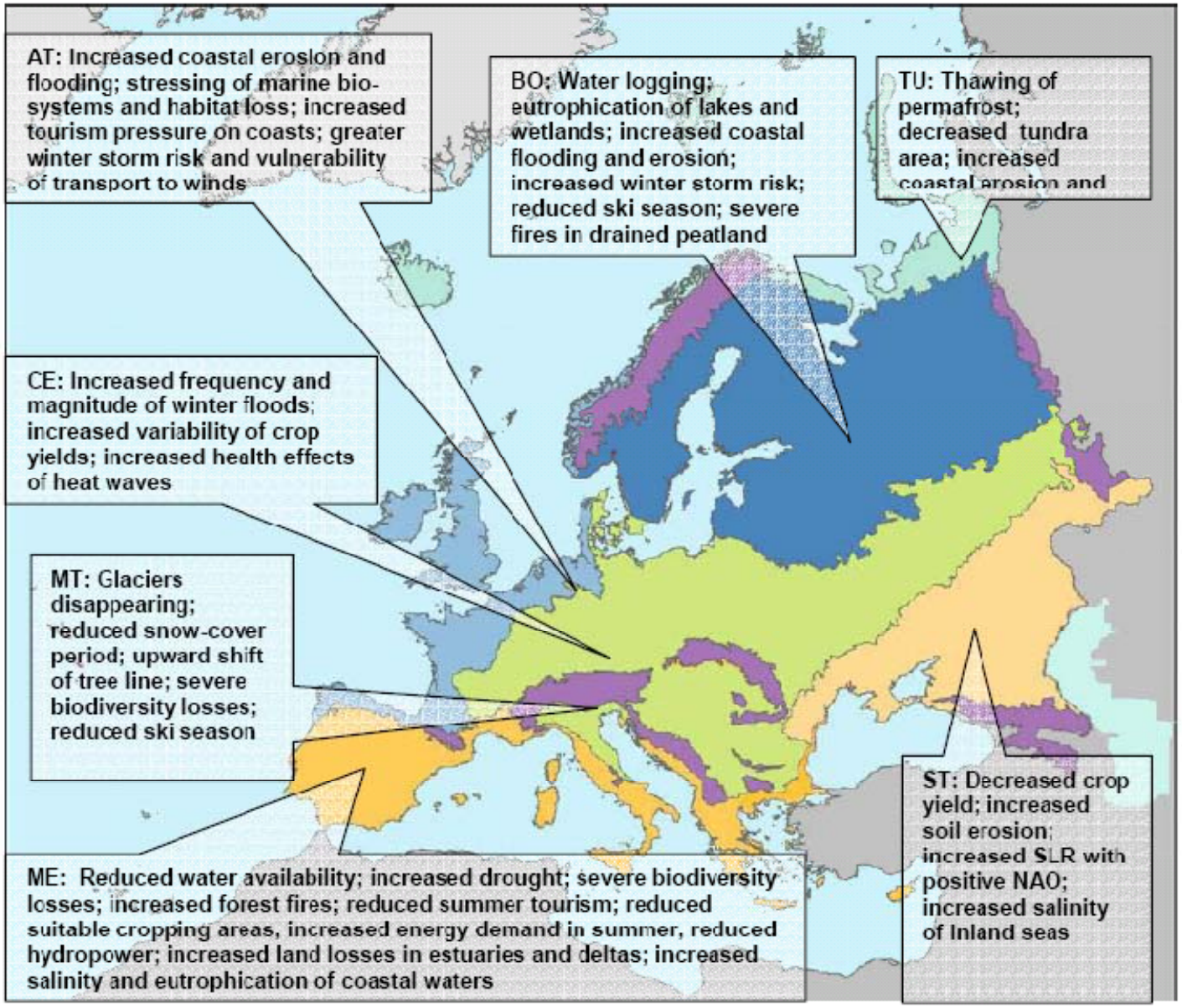


Figure 7.9: Change in magnitude of 100-year droughts. Left map: Comparison of results calculated with WaterGAP 2.1 for today's climate and water use (1961-90) and for the 2070s (HadCM3 climate model and Baseline-A water use scenario). Right map: Comparison of results calculated with WaterGAP 2.1 for today's climate and water use (1961-90) and for the 2070s (Baseline-A water use scenario at today's climate). ***Source : Eurowasser study, University of Kassel***

Climate Change impacts on Water - 7



Key European vulnerable regions and sectors

Source: IPCC, 2007; EEA, 2004

Summary

- Many of the most severe impacts are linked to changes in spatial and temporal availability of water
- There are strong links between loss of biodiversity, lack of water retention in ecosystems, loss of soil productivity and environmental disasters
- Environmental, health and economic impacts are often exacerbated by a combination of economic development and climate change
- Increasing differentiation within Europe and the exacerbation of existing problems

Climate Change impacts on Water-9

Summary, continued

- The story is about too much and too little water, but let's not forget effects on water quality
- Water is a cross-sectoral adaptation issue (agriculture, tourism, energy, biodiversity, navigation, etc.)
- There is enough knowledge to act and adaptation has started, but there is much more to do within each of the policy sectors
- **Stern review: "In developed countries, adaptation will be required to reduce the costs and disruption caused by climate change ...."**

EU Water Policy and Adaptation -1

Some existing water and adaptation related policies

- Surface and Groundwaters: River Basin Management => Water Framework Directive (WFD) (2000/60/EC)

- Man's use of Water => Efficiency improvements and water demand management and WFD (Pricing!) – under development (Communication on Water Scarcity and Droughts, COM (2007) 414)

- Disaster Management => Floods Directive, EU Solidarity Fund, Civil Protection Mechanism

EU Water Policy and Adaptation-2

Green Paper 'Adapting to Climate Change in Europe'

- Adopted 29 June 2007
- Early action could bring clear economic benefits
- The EU plays an important role in adaptation
- Four lines of priority actions to be considered:
  - Early action where current knowledge is sufficient;
  - Integrating adaptation into the EU's external relations;
  - Filling knowledge gaps with EU-level research;
  - Involving society in preparation of adaptation strategies.
- Follow-up
  - Broad public debate in 2007 - 2008, including 4 regional workshops in autumn 2007 and web-based consultation;
  - White Paper and Impact Assessment by the end of 2008.

EU Water Policy and Adaptation-3

White Paper 'Adapting to Climate Change in Europe'

- To be published by the end of 2008
- Will recognise the need for involving civil society and of taking action at all levels
- Will focus on **early action at the EU level**
- Will address a.o. funding, land use and management, awareness raising
- Will be accompanied by an **Impact assessment**
- **Stakeholder meeting** will take place in Brussels on 16 May 2008, for more information see:

http://ec.europa.eu/environment/climat/adaptation/index_en.htm

Existing Policies and Adaptation- 1

- Water Framework Directive (2000/60/EC) – Main elements
  - Overall framework for integrated management on the basis of river basins
  - Ambitious objectives (e.g. good status by 2015)
  - Establishment of river basin management plans, 6-year cycles beginning in 2009
  - Water pricing policies by 2010
  - Stakeholder involvement and public participation

Existing Policies and Adaptation-2

RBMPs and CC aspects - 1

- Include CC already in first RBMP (as the direction of cc impacts is known) and do a climate check of the first Programme of Measures
- More detailed analysis in 2nd and 3rd cycle
- The principles of applying exemptions and the water status assessment remain the same under a changing climate.

Existing Policies and Adaptation-3

RBMPs and CC aspects (cont'd)

- preventing pollution and saving water will **lower the carbon impact** of extracting, transporting and treating water – synergy between climate change adaptation and mitigation – between water and energy consumption

- **->Climate Change is no excuse for not achieving the WFD objectives**

Existing Policies and Adaptation-4

Floods Directive and Climate Change

-Adopted end of July 2007

-Three stage process :

- ☑ Preliminary flood risk assessment (2011): include climate change considerations (2011)
- ☑ Flood hazard and flood risk maps (2013), based on medium and low probability floods: scenarios could include climate change
- ☑Flood risk management plans (2015), eg addressing sustainable land use management

-Coordination and synchronisation with WFD

Existing Policies and Adaptation-5

Water Scarcity & Drought and CC

Communication from the Commission - July 2007

- A worldwide problem –**EU not spared anymore**
- Water scarcity and drought : **two different issues**
- Need to fully consider impacts of **climate change**

Existing Policies and Adaptation-6

Water Scarcity & Drought and CC (cont'd)

- Focus on **Water Demand Management**, cf energy
- Progress towards **full implementation of the WFD**
- **WFD allows for Drought Management Plans**
- Address ineffective **water pricing policies**
- Improve land use and planning: address inadequate **water allocation**

Existing Policies and Adaptation-7

Water Scarcity & Drought and CC (cont'd)

- **Water saving** must become the priority. There is huge potential, EU wastes at least 20% of its water.
- Further **integrate water concerns** into sectoral policies
- Fill **knowledge gaps** and ensure data comparability

Existing Policies and Adaptation-8

Summary of Implementation Challenges

- **Sustainable Water Management = Adaptation**
- **Ample tools for water related adaptation already exist at EU level**

But:

- Full implementation of existing instruments is needed
- Further integration & involvement of all other sectors, incl making funding climate proof
- Polluter/user needs to pay – economic instruments

Water related challenges for Adaptation White Paper - 1

- The White Paper will consider principles to guide adaptation in the EU and create a framework for how adaptation issues must be considered in all policy areas
- It will also consider new areas where there are significant adaptation gaps and which are mature for action at EU level

Water related challenges for Adaptation White Paper - 2

- Water related issues for consideration for inclusion in the White Paper include
  - Improved land management to protect water resources, soil and biodiversity
  - Further disaster prevention measures (e.g. coastal protection and key infrastructures)
  - Changes in key sector policies such as agriculture, regional, energy and transport policies

Water related challenges for Adaptation White Paper - 3

- Changes in EU funding priorities
- Market based instruments for adaptation
- Raising public awareness
- Further research and assesments in support of policy and of individual and sector adaptation

Additional Information – 1

National plans and measures

- Preparation of national adaptation strategies: **Denmark**, **Germany, Finland, France, Netherlands, Portugal, Spain, UK, Hungary, Slovak Republic etc**
- Sectoral actions mainly in areas with a some times long tradition of dealing with climate extremes such as **flood defence, water scarcity and droughts**
- **Water sector-** recent focus of EEA study (with German Presidency) with a country survey: very high awareness, measures implemented, planned or underway from technical engineering, building codes, spatial planning, improved forecasting, improved landscape management, behaviour campaigns, new economic instruments

Additional Information – 2

Relevant EU Research Programmes

- **PRUDENCE/ENSEMBLES** (ENSEMBLE based predictions of climate change and their impacts)
- **ADAM** (Adaptation and Mitigation Strategies: Supporting European Climate Policy)
- **CIRCE** (Climate Change and Impact Research: the Mediterranean Environment)
- **ESPACE** (European Spatial Planning: Adapting to Climate Events)
- **Euro-limpacs** (Evaluating the Impacts of Global Change on European Freshwater Ecosystems)
- **FLOODSITE** (Integrated Flood Risk Analysis and Management Methodologies)
- **GRACE** (Groundwater Resources and Climate Change Effects)
- **PACE** (Permafrost and Climate in Europe)
- **SCENES** (Water Scenarios for Europe and for Neighbouring States)
- **WATCH** (quantification and prediction of the components of the current and future global water cycles)
- **FLASH** (forecasting of flash floods)
- **DEMETER** (climate variations – implications for energy, agriculture, tourism and health)
- **NEWATER** (adaptive management of river basins incl social science).

Additional Information – 3

Examples of national assessments

- Finland: FINADAPT (Assessing the adaptive capacity of the Finnish environment and society under a changing climate)
- Germany: KomPass (Competence Centre on Climate Change Impacts and Adaptation)
- Hungary: VAHAVA Changing (VÁltozás) Impact (HAtás) Response (VÁlaszadás)
- Netherlands: CcSP (Climate Changes Spatial Planning)
- Portugal: SIAM (Scenarios, Impacts and Adaptation Measures)
- Spain: ECCE (Assessment of the Preliminary Impacts in Spain due to Climate Change)
- Sweden: SWECLIM (Swedish Regional Climate Modelling Programme)
- UK: UKCIP (Climate Impact Programme)
- All countries: communications to UNFCCC

THE END

EC Water Website:

http://ec.europa.eu/environment/water/index_en.htm

Water Information System for Europe (WISE):

http://water.europa.eu