Water: Under Pressure

Europa's vandmiljø

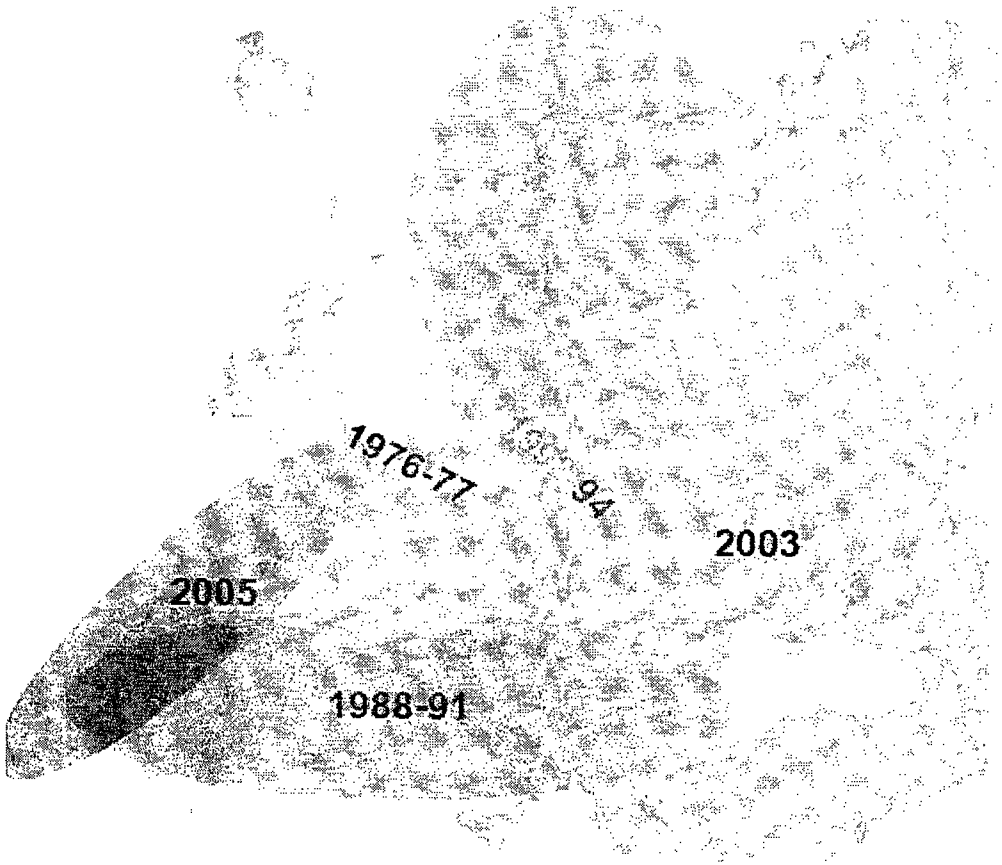
- **Tørke og vandmangel**
- **Klimaændringers påvirkning af vandmiljøet**
- **Vandkvalitet – nitrat i danske vandløb sammenlignet med det det øvrige Europa**

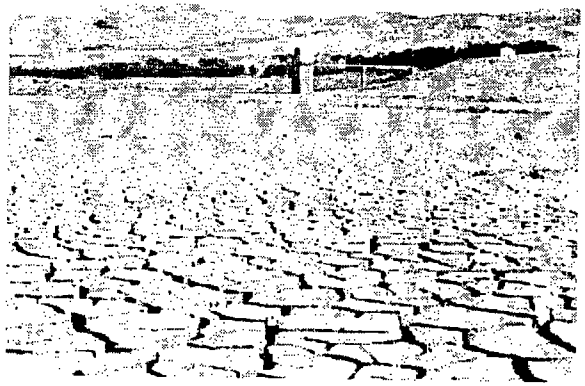
Peter Kristensen

Project manager ferskvand

European Environment Agency

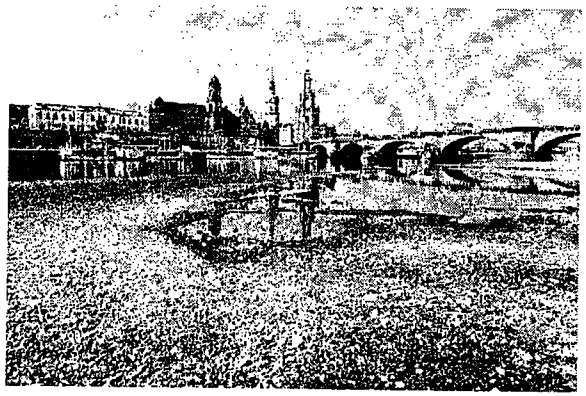
Tørke og vandmangel i Europa





Vandreservoir
Sicilien

Vandreservoir
Cypern



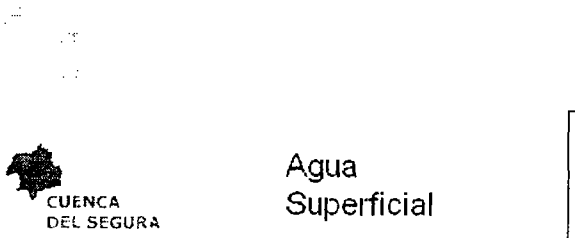
Elben ved Dresden
Foåret 2007

Kilde: Tallaksen L. 2007:

http://www.geo.uio.no/for_skolen/lena-torke.pdf

European Environment Agency

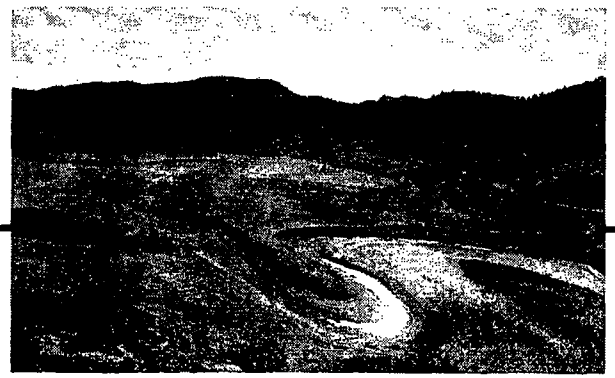
Segura River Basin District – syd for Valencia



		Recursos	Demandas	
	Agua Superficial Overfladevand	640	217-255-260	Urbana Vandværker 23-38-38 Industrial Industri
Grundvand	Agua Subterránea	220		
Genbrug af spildevand	Reutilización	100-113-118	1.660	Regadío Kunstvanding
Vand fra Tajo floden	Trasvase Tajo-Segura	540		
Afsaltning	Desalación 0-40-40			
	Vandmangel	460 **Déficit**		60 Medioambiental Minimumsvandføring

situación actual horizonte 10 años horizonte 20 años

- Fuente de datos: Plan Hidrológico Cuenca Segura
- Todos los valores en Hm^3



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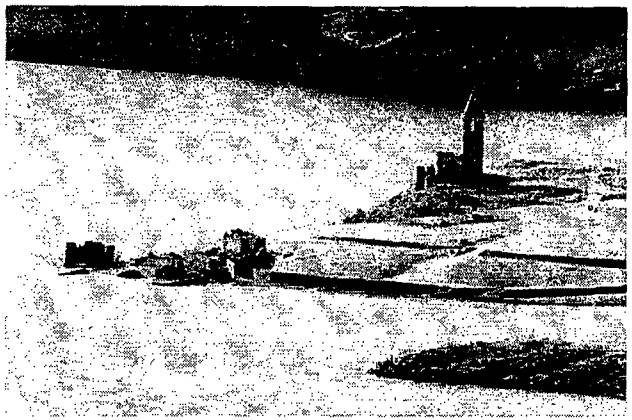
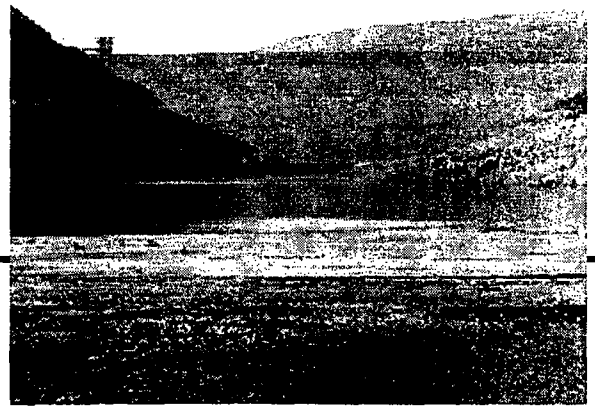
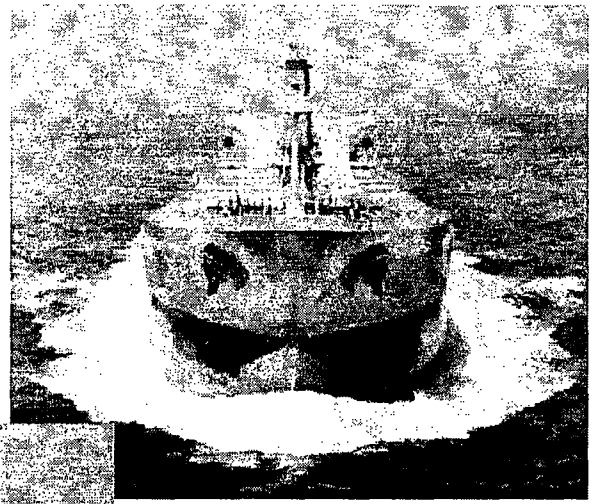
Tørke og vandmangel i 2008

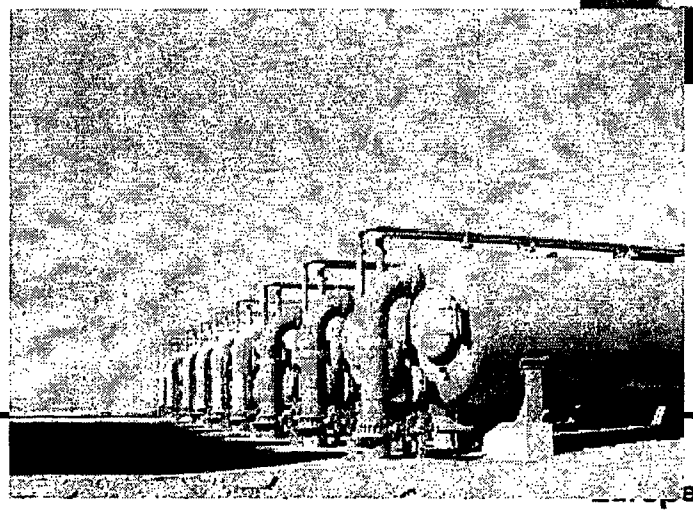
Vandmængden i reservoirer til Barcelona og Cypern foråret 2008





Henover sommeren er der sejlet omkring 30 tankskibe med vand fra Grækenland til Cypern

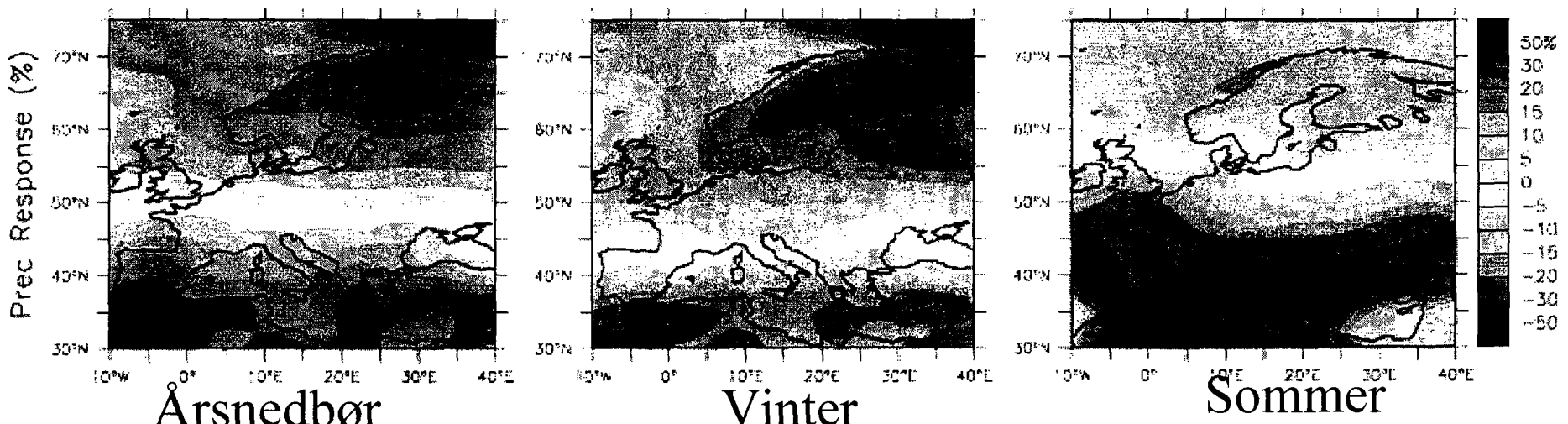




Afsaltningsanlæg

Klimaændringer: Ændringer i nedbør – mindre i syd og mere i nord

Map 5.5 **Modelled precipitation change between 1980–1999 and 2080–2099**



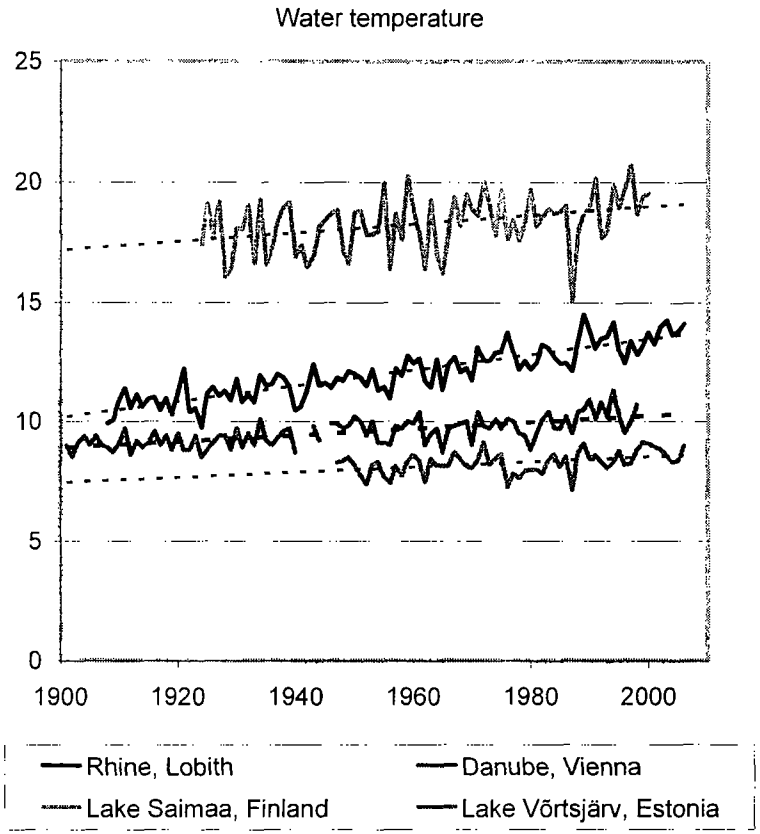
Note: Left: annual; middle: winter (DJF); right summer (JJA) changes % for the IPCC-SRES A1B emission scenario averaged over 21 models (MMD-A1B simulations).

Source: Christensen *et al.*, 2007. Published with the permission of the Intergovernmental Panel on Climate Change.

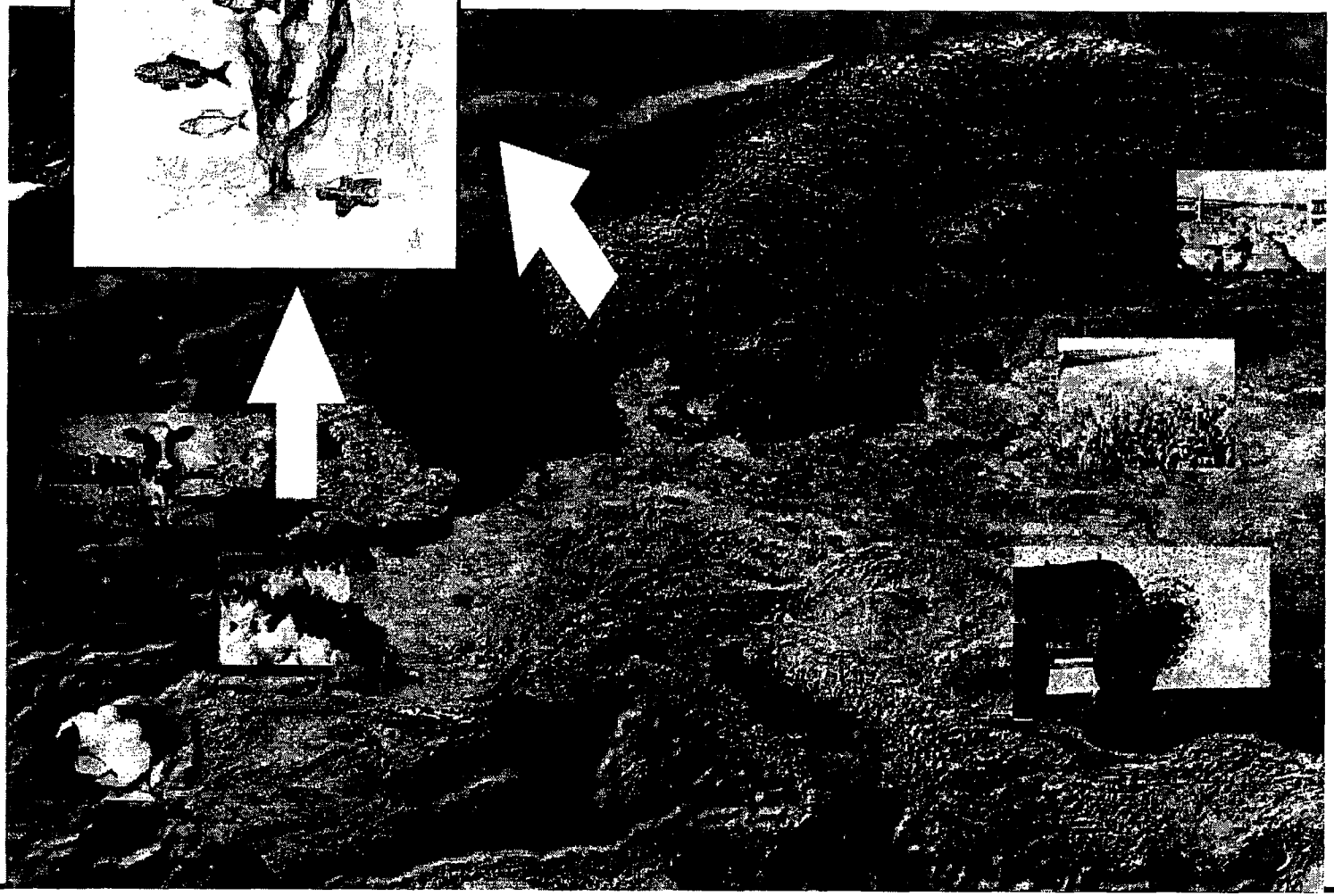
Højere temperatur

Vandtemperaturen i floder of søer stiger

- Over de sidste 100 år er vandtemperaturen steget 1-3 °C
- Rhinen ved den tysk-hollandske grænse
- Donau i Vien
- Saimaa søen i Finland (August temp.)
- Vortsjärv søen i Estland



Nitrat forurening af Europa's vandområder



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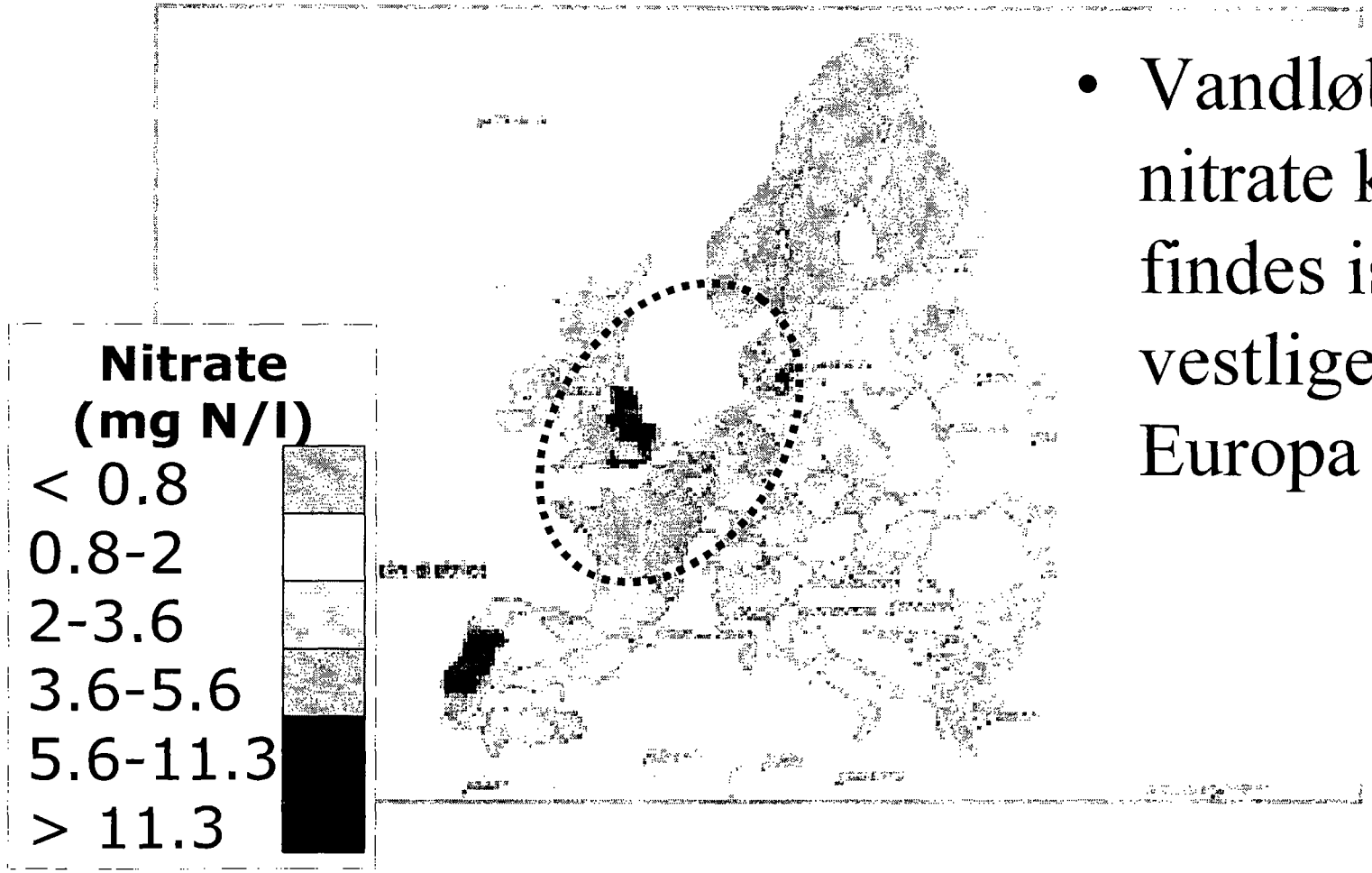
Nitratkoncentration i vandløb per vandområde (river basin districts, latest year (most RBDs 2006))

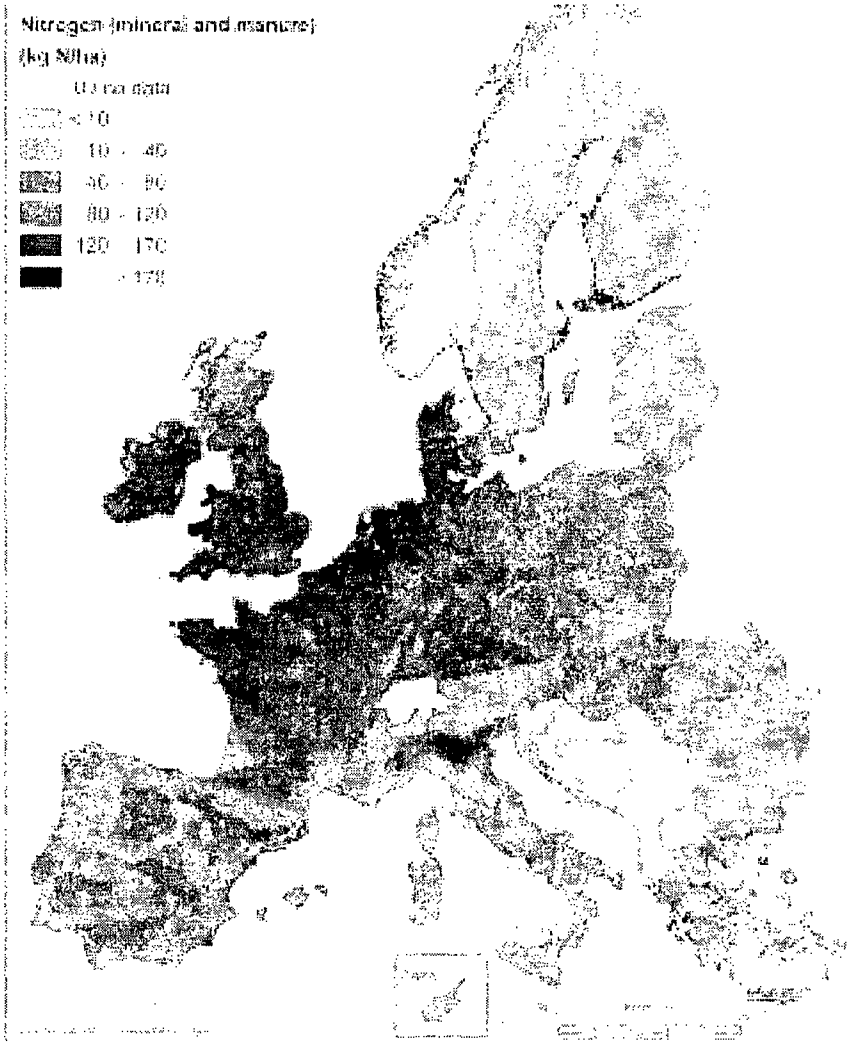


- Vandløb med høj nitrate koncentration findes især i det vestlige-central Europa

See WISE
http://www.eea.europa.eu/themes/water/mapviewers/soe-ri-ni

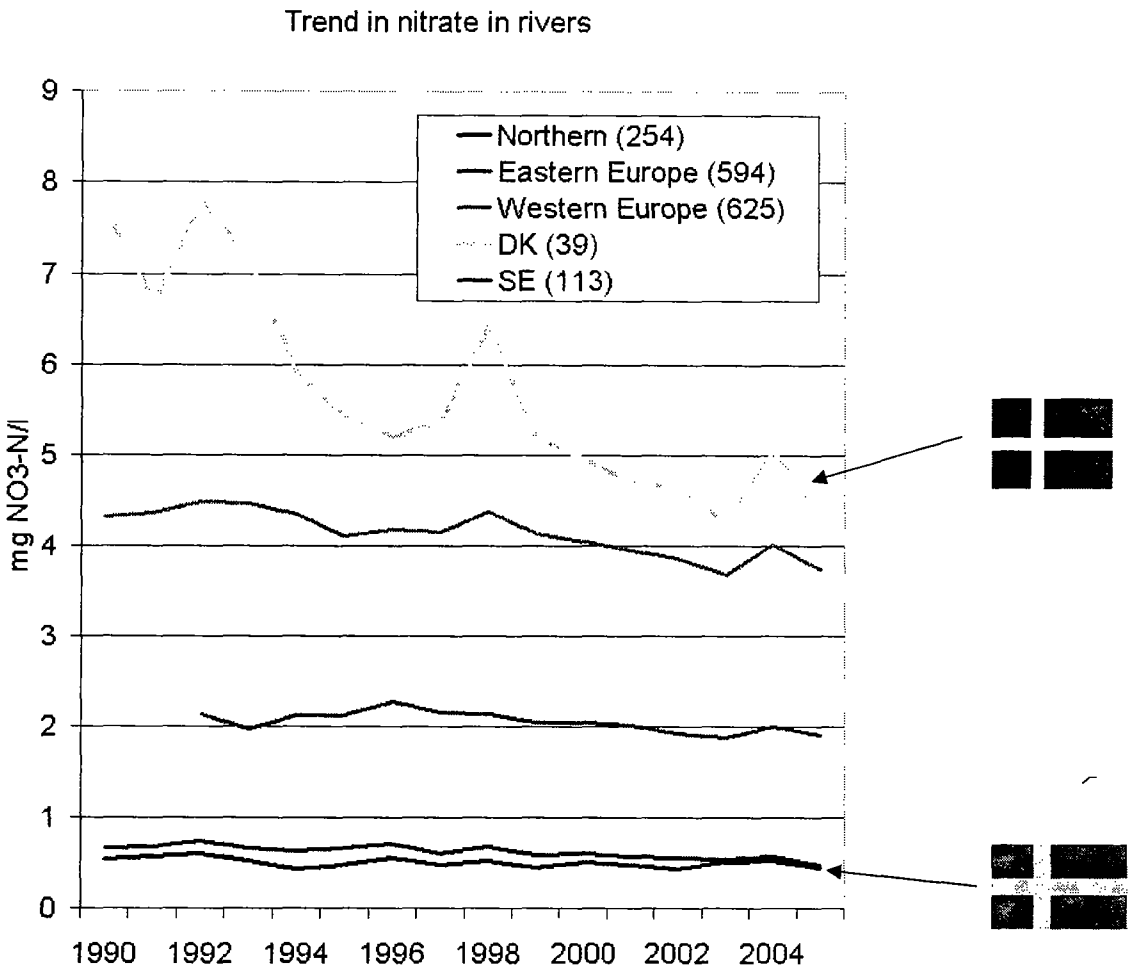
European Environment Agency

Tilførsel af kunst- og husdyrgødning



European Environment Agency

Udvikling i nitratkoncentration i vandløb

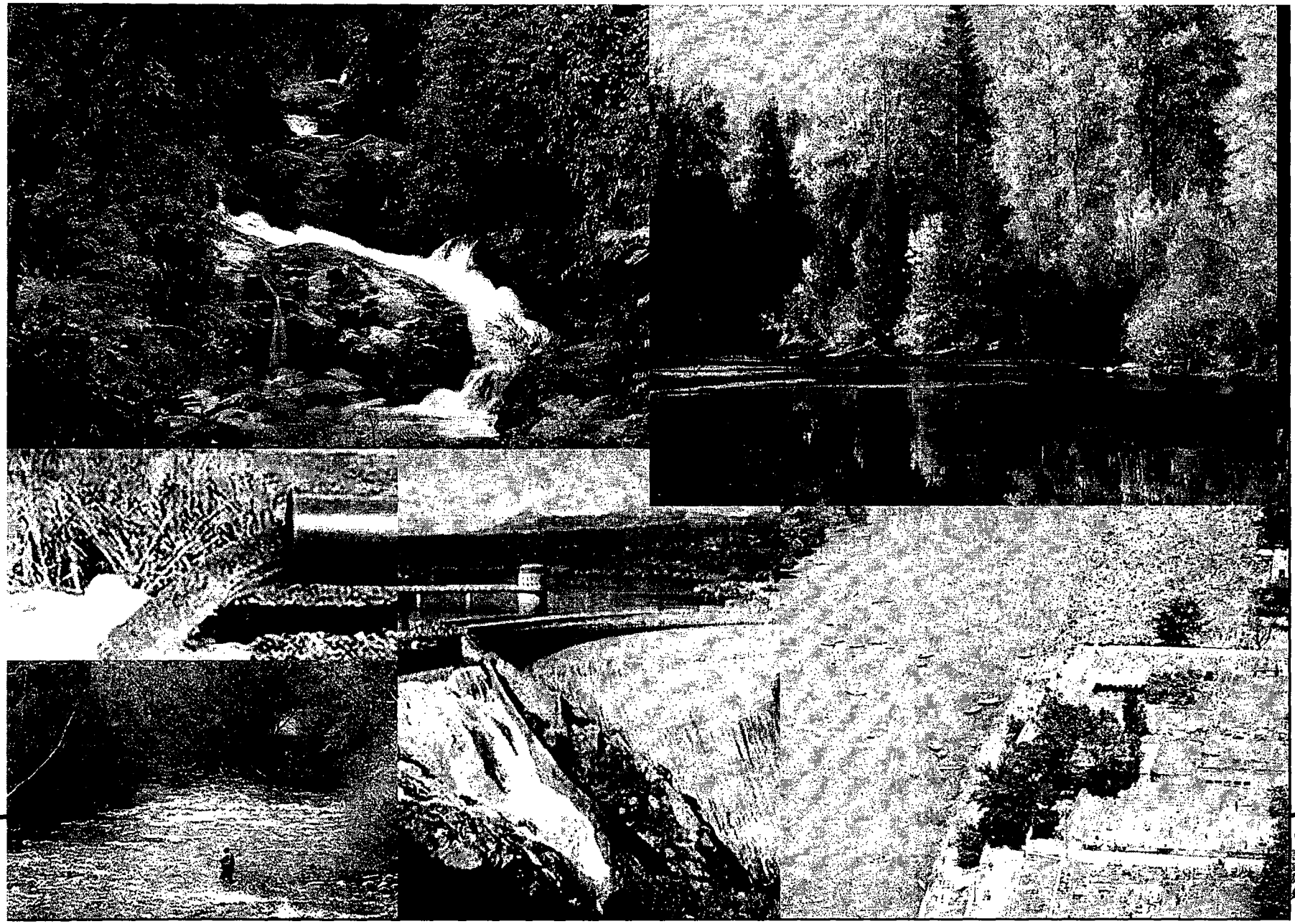


European Environment Agency

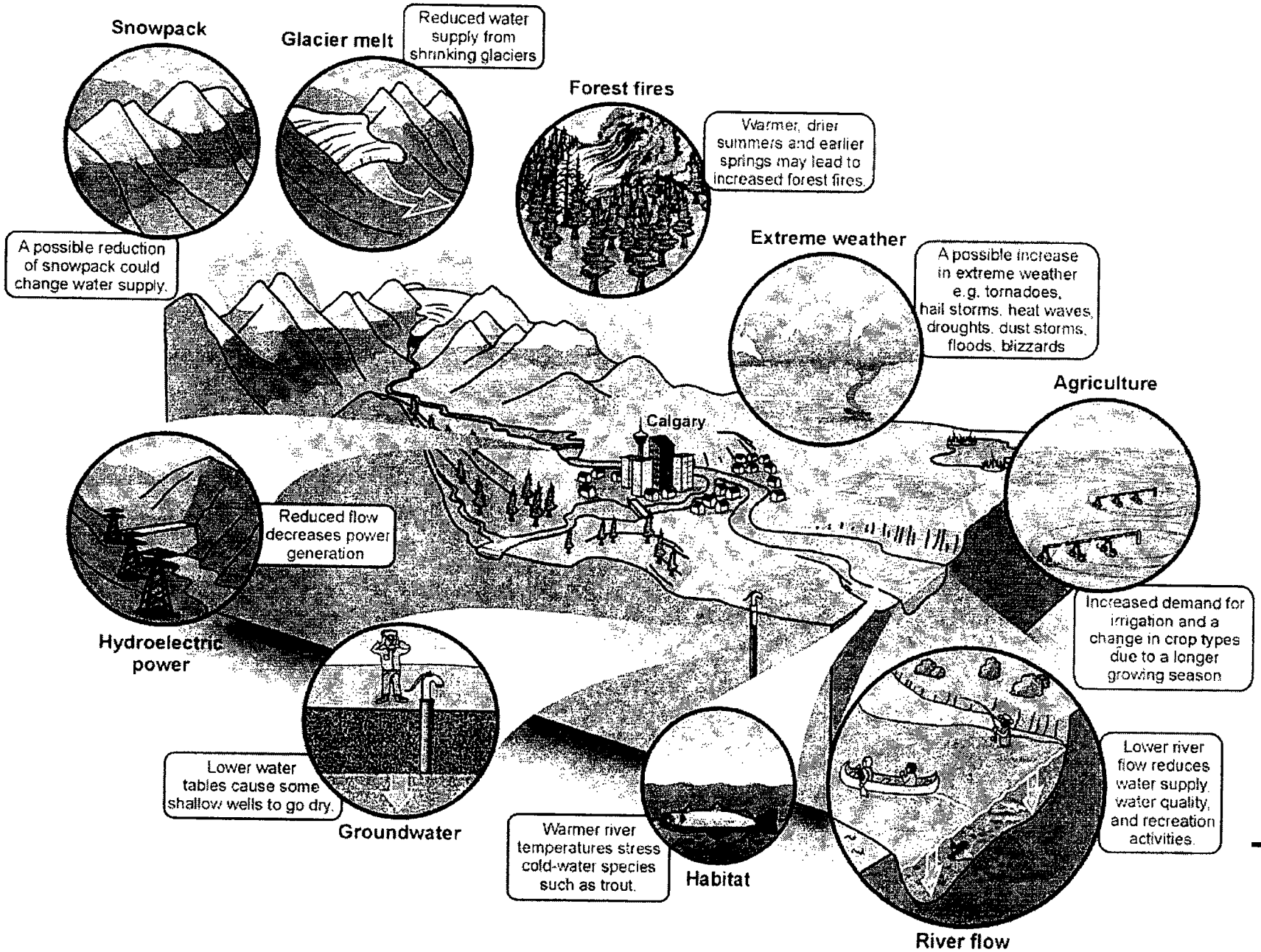
Vil Europa's søer se sådan ud i fremtiden?

European Environment Agency

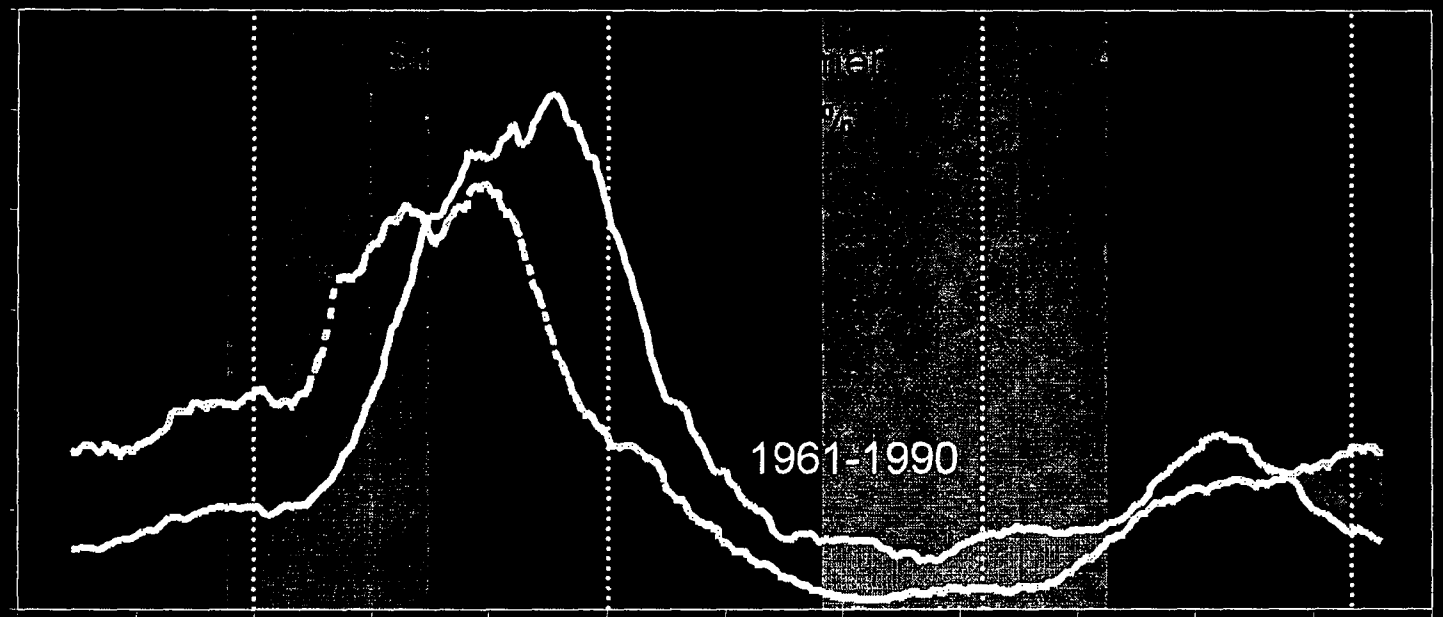
Mange forskellige typer af vandområder



Klimaændringers påvirkning af ferskvand



Changes in runoff in the central Alps (HIRHAM RCM)



Source: Beniston, 2006.

Low-flow - upper Danube (Passau – 76 000 km2)

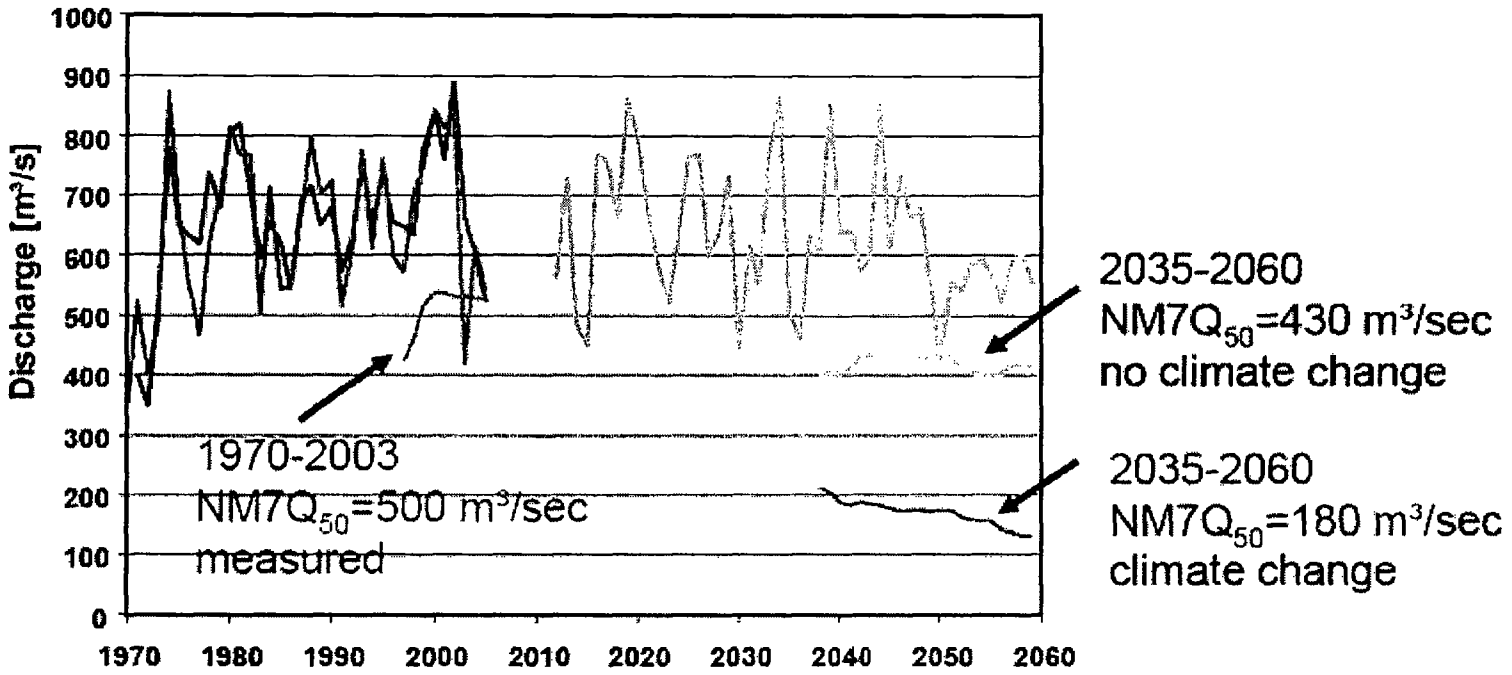
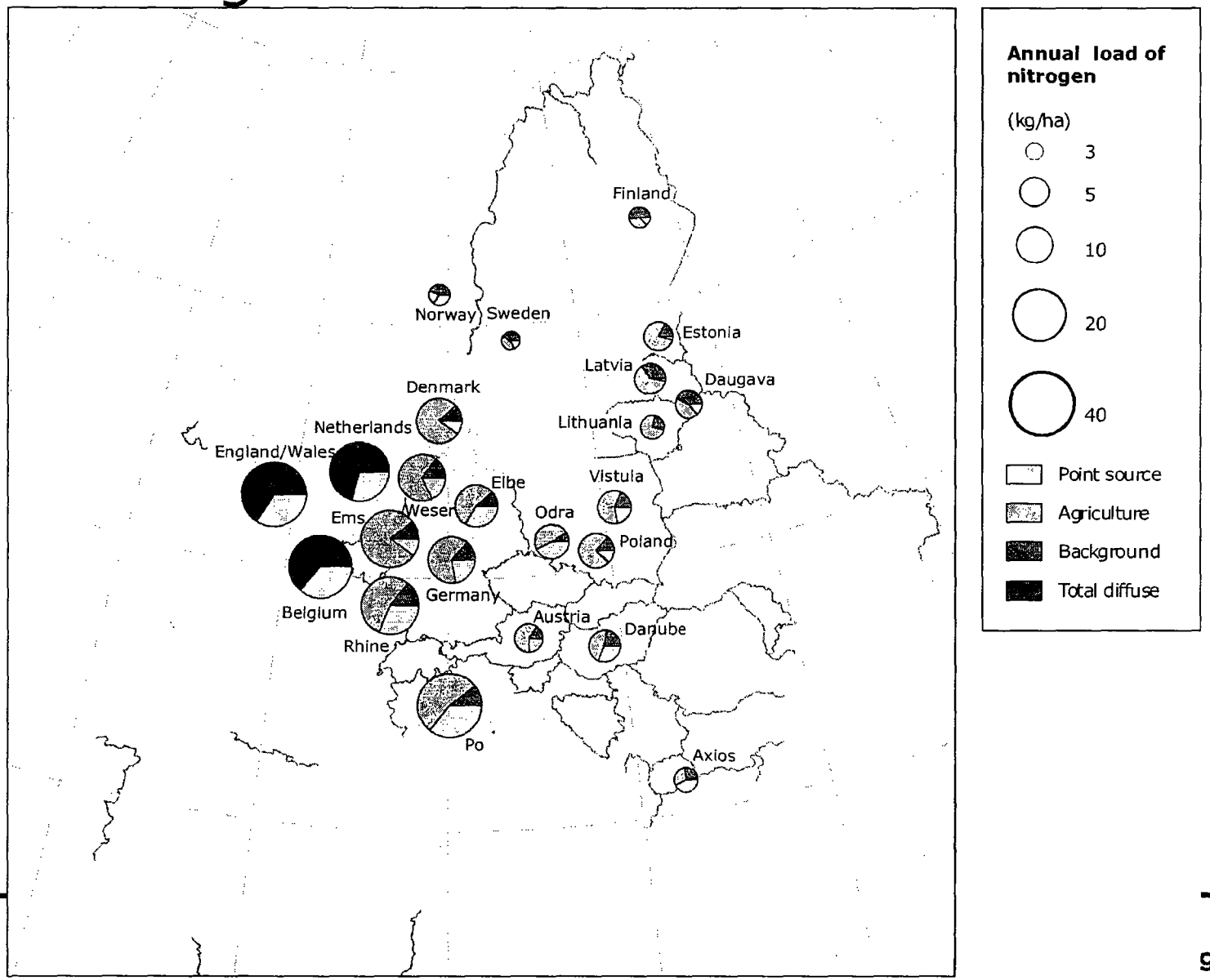


Fig.7: Development of the 50-years return period NM7Q low-flow condition at gauge Achleiten; blue = determined from measurements, green = no climate change, red = average from realisation 1-12 from Fug.6

Source: GLOWA-Danube – Mauser et al. 2008:

http://ksh.fgg.uni-lj.si/bled2008/cd_2008/03_Global%20climate%20change%20and%20hydrological%20processes/060_Mauser.pdf

Source apportionment of nitrogen load in selected regions and catchments.



gency

Climate change impacts, vulnerability and adaptation

Danish Parliament Environment Committee visit
EEA, 19 November 2008

Dr. Stéphane Isoard
Climate change adaptation & outlooks

Overview of EEA activities

Clusters of activities

- Climate change impact and adaptation indicators
- Climate change vulnerability mapping and adaptation
- Support information sharing
- Costs of inaction to climate change
- Climate change outlooks and scenarios
- Addressing disaster prevention and management

Key forthcoming policy cycles, events & activities

- Adaptation White Paper (early 2009; 2007 Commission Adaptation Green Paper)
- UNFCCC – COP 15 Copenhagen December 2009: post-2012 mitigation & adaptation agreement, ODA
- State of the Environment and Outlook report 2010 (SOER2010)
- Existing legislation: Water FWD, Natura2000, 2008 Commission Green Paper on Territorial Cohesion

Overview of EEA activities

Key projects

- Impacts of Europe's changing climate – 2008 indicator-based assessment (EEA-JRC-WHO report)
- Support to the White Paper impacts assessment
- Support to the development of a European Clearinghouse on climate change impacts, vulnerability and adaptation in Europe
- Vulnerability & adaptation to water scarcity in the Alps
- Mapping vulnerability and addressing disaster prevention and management
- Developing adaptation indicators
- Integrated mitigation, impacts & adaptation costs and outlooks
- Hindcasting Europe's climate

2008 EEA-JRC-WHO report 'Impacts of Europe's changing climate'

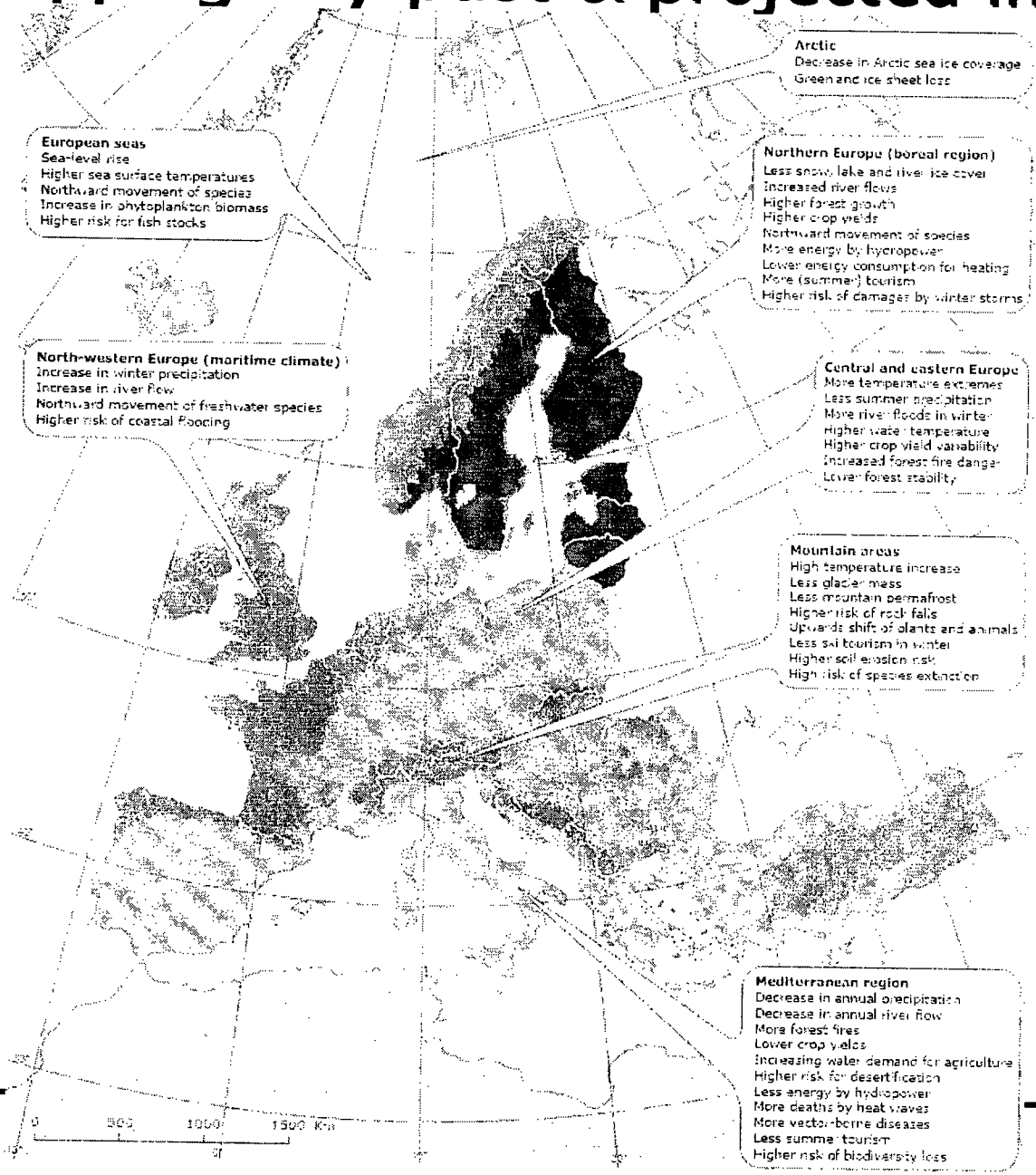
Indicators

- Atmosphere and climate
- Cryosphere (glaciers, snow and ice)
- Marine biodiversity and ecosystems
- Water quantity
- Freshwater quality and biodiversity
- Terrestrial ecosystems and biodiversity
- Soil
- Agriculture and forestry
- Human health

Update of 2004 edition

http://reports.eea.europa.eu/eea_report_2008_4/en/

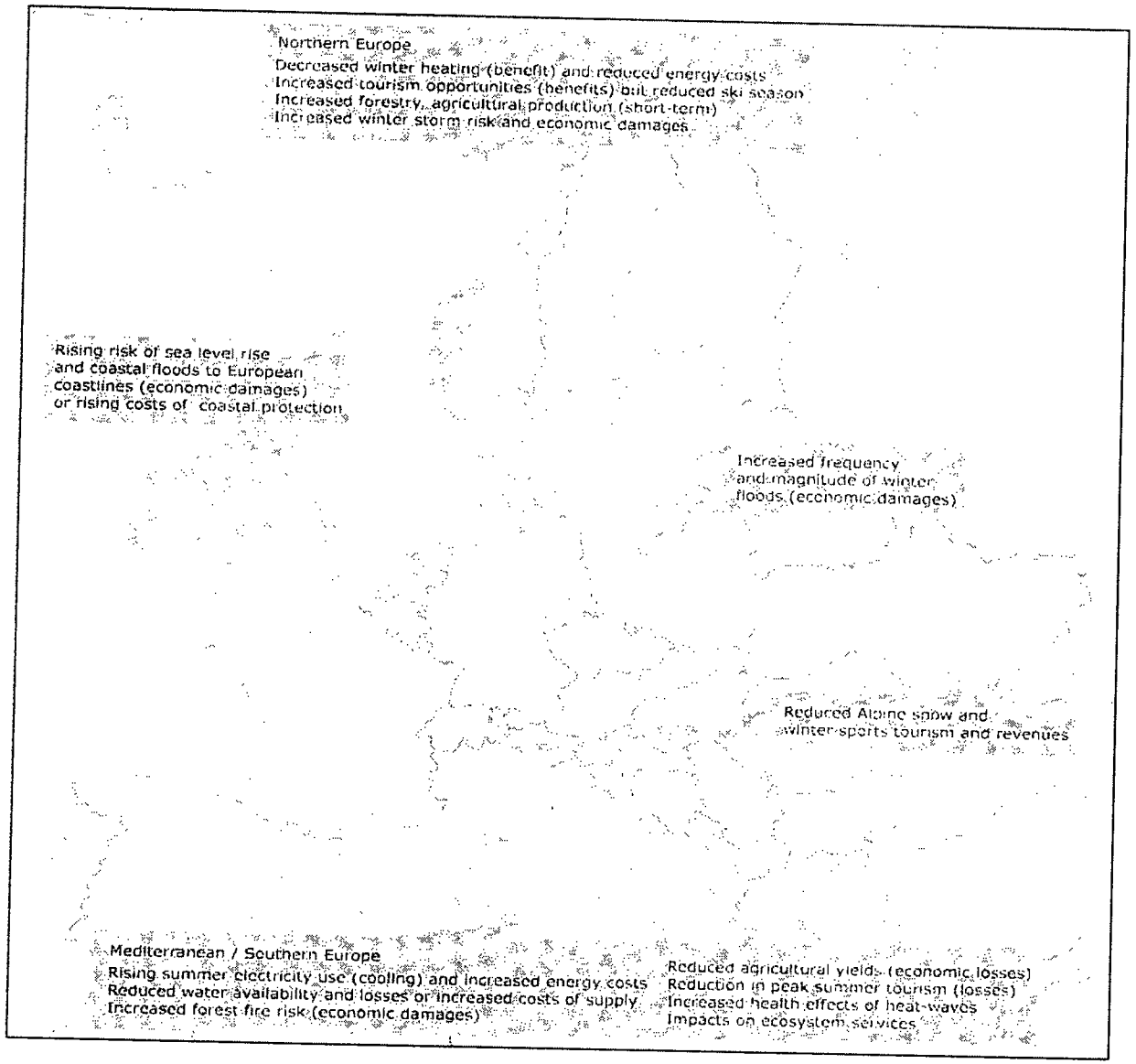
Mapping key past & projected impacts



Main biogeographic regions of Europe (EEA member countries)

- Arctic
- Arctic — Greenland (not EEA member)
- Boreal region
- North-western Europe
- Central and eastern Europe
- Mountain areas
- Mediterranean region

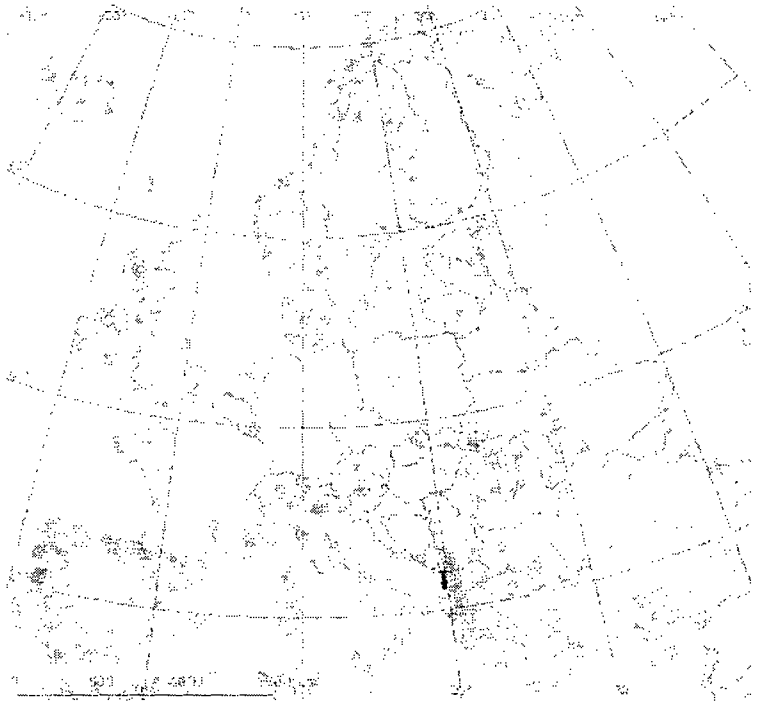
Examples of potential economic effects



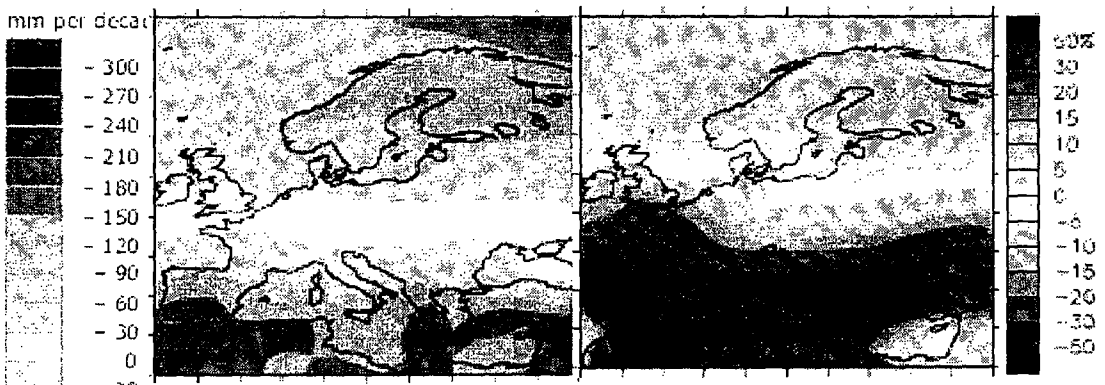
European precipitation

- northern Europe 10-40 % wetter, southern Europe up to 20 % drier (1900–2000)

past



Observed changes in annual precipitation between 1961-2006



annual ***summer***

Modelled precipitation change between 1980-1999 and 2080-2099

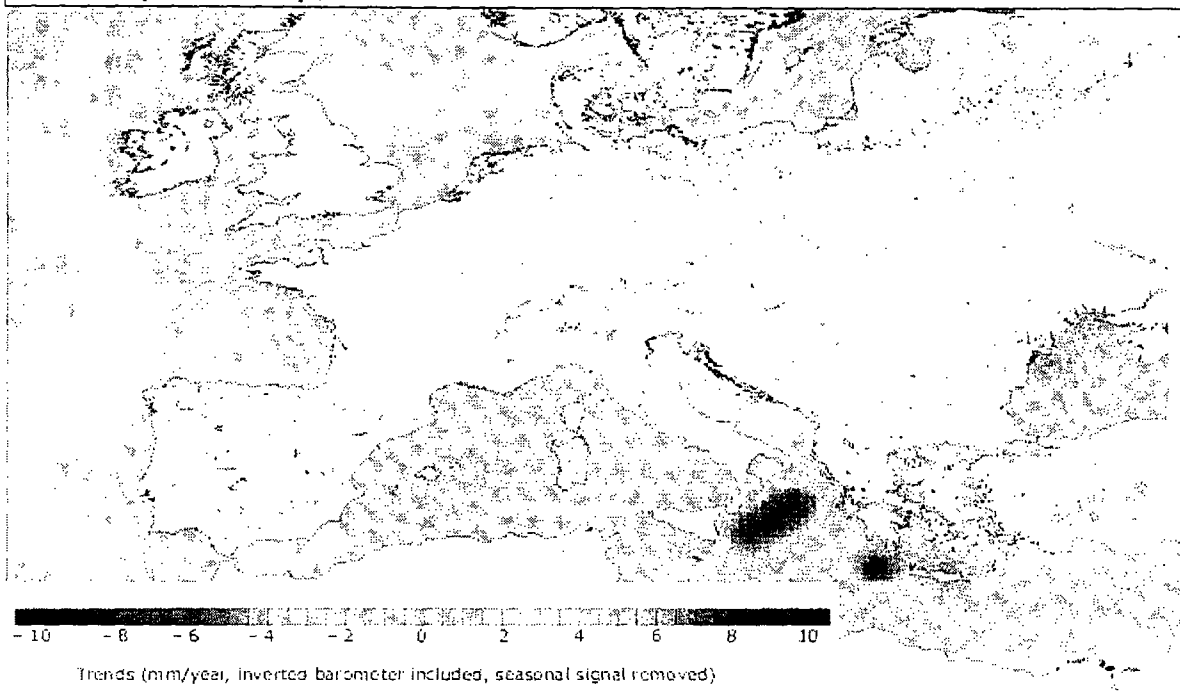
- Projection (1980-1999) to (2080-2099) : 5-20% increase for northern Europe and 5-30% decrease in southern Europe

future

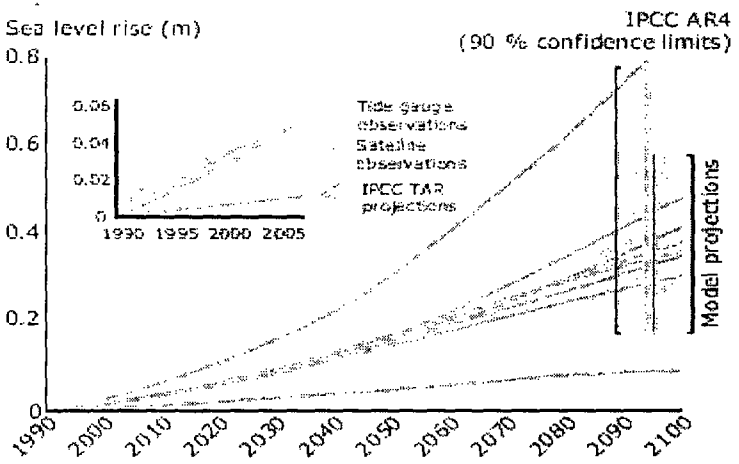
Sea level rise

past

- Global average SLR during the 20th century was about 1.7mm/year
- Recent satellite and tide-gauge data indicate a higher average rate of about 3.1 mm/year in the past 15 years



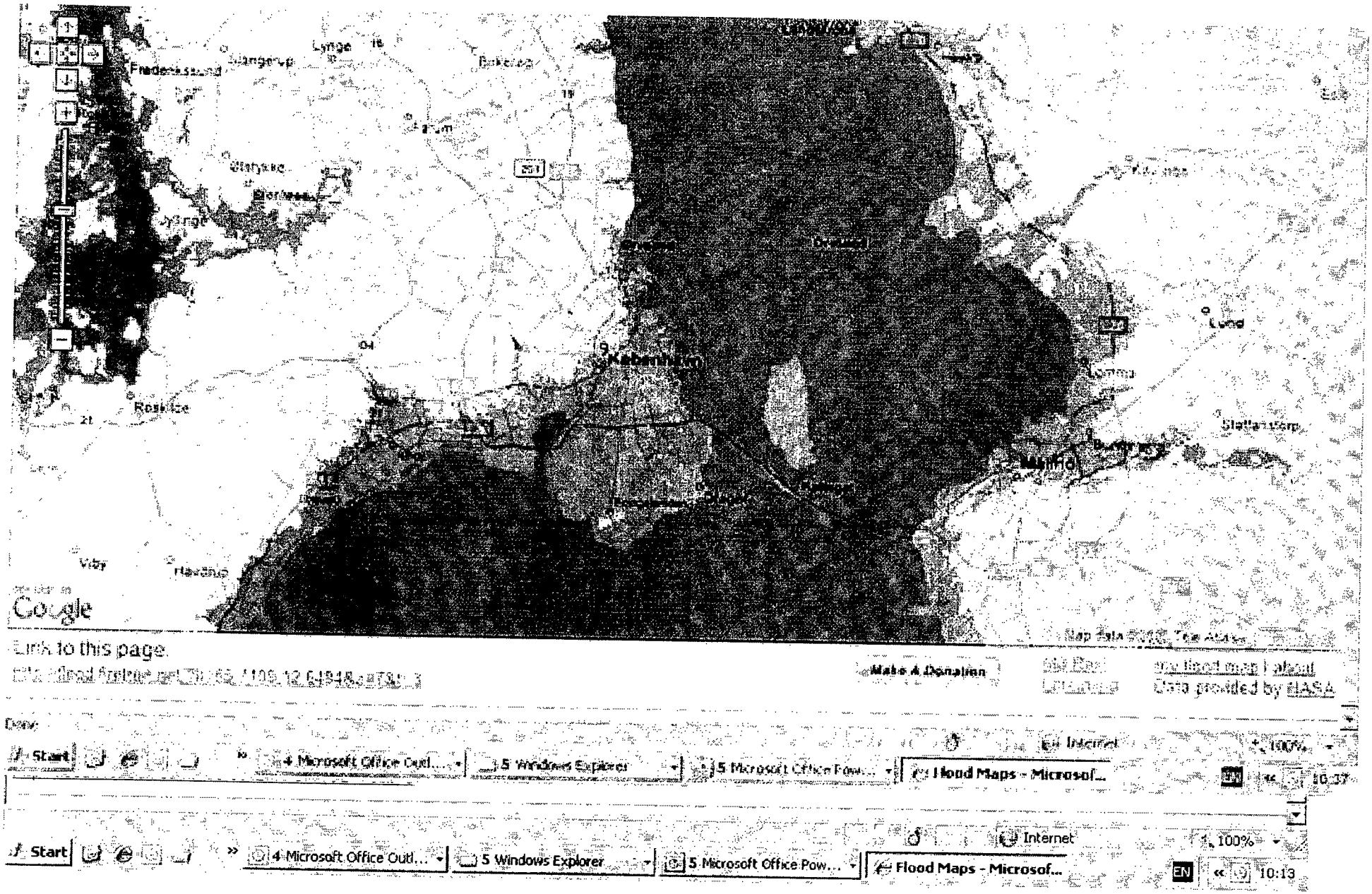
Sea level changes in Europe 1992-2007



Projected global average sea-level rise 1990-2100

future

- Sea level will rise 0.18 to 0.59 m from 1980-2000 to 2100 (IPCC)
- Recent projections indicate a future SLR that may exceed the IPCC upper limit


Google
Link to this page
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Data provided by NASA
Start
4 Microsoft Office Outl...
5 Windows Explorer
5 Microsoft Office Pow...
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Internet
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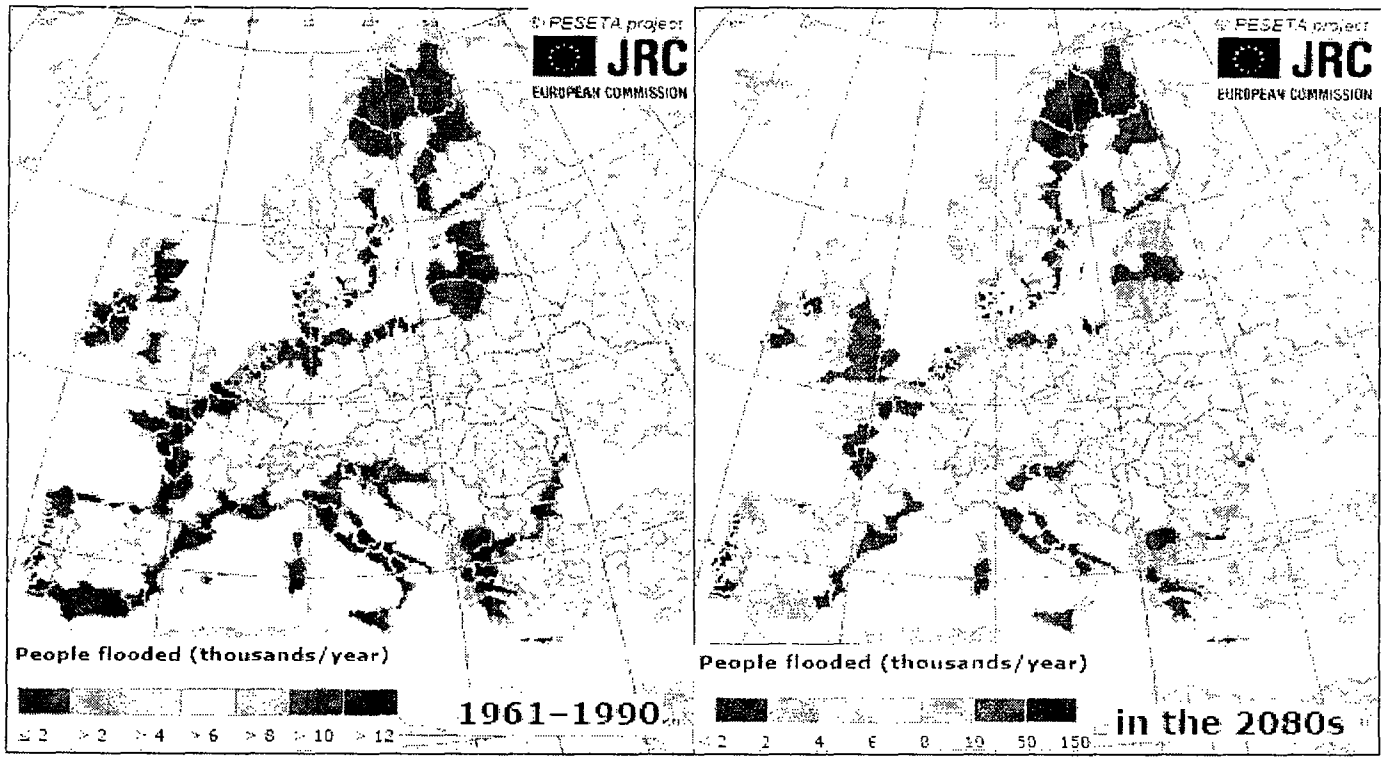
Coastal areas

- One third of the EU population is estimated to live within 50km of the coast and some 140,000 km² of land is currently within 1m of sea level.

past



Modelled number of people flooded across Europe's coastal areas in 1961-1990 and in the 2080s

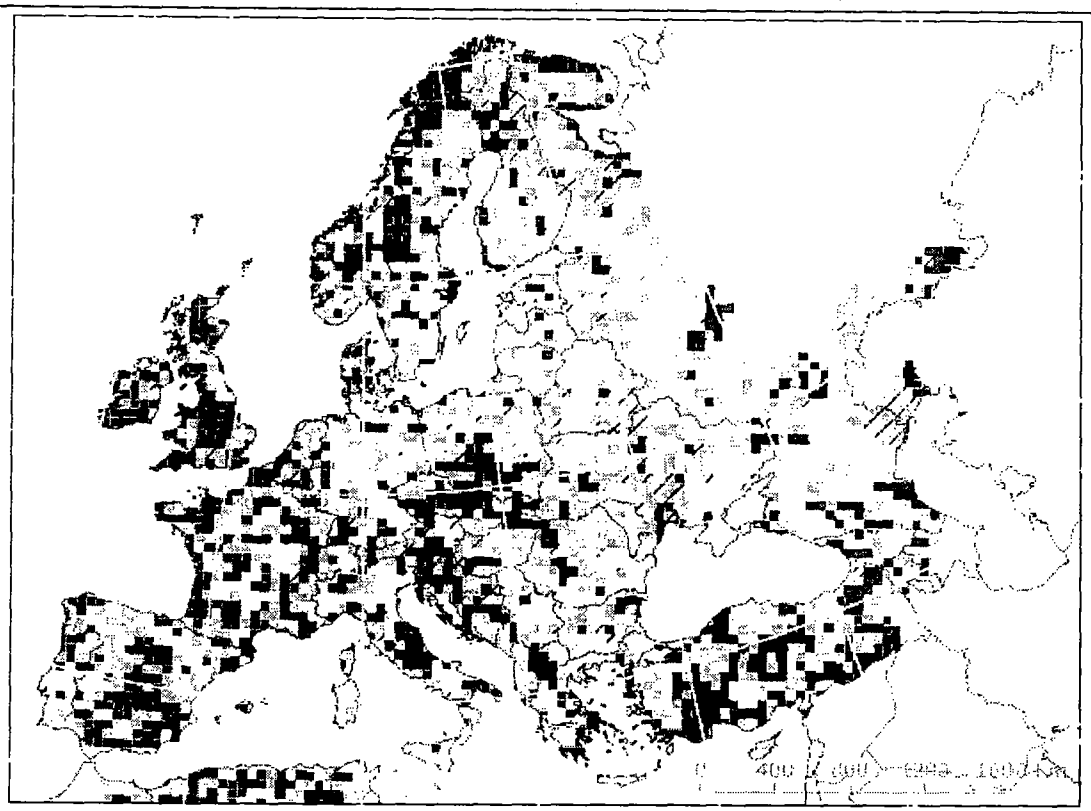
- 12-18 billion Euro/year economic damages in European coastal areas by 2080 (high emission scenario)
- Adaptation could significantly reduce the risk to around EUR 1 billion

future

Growing season for agricultural crops

past

- The lengths of the growing season of several agricultural crops has increased in the North, favouring the introduction of new species
- Locally in the south there is a shortening of growing season, with higher risk of damages from delayed spring frost



Rate of change of crop growing season length 1975-2007

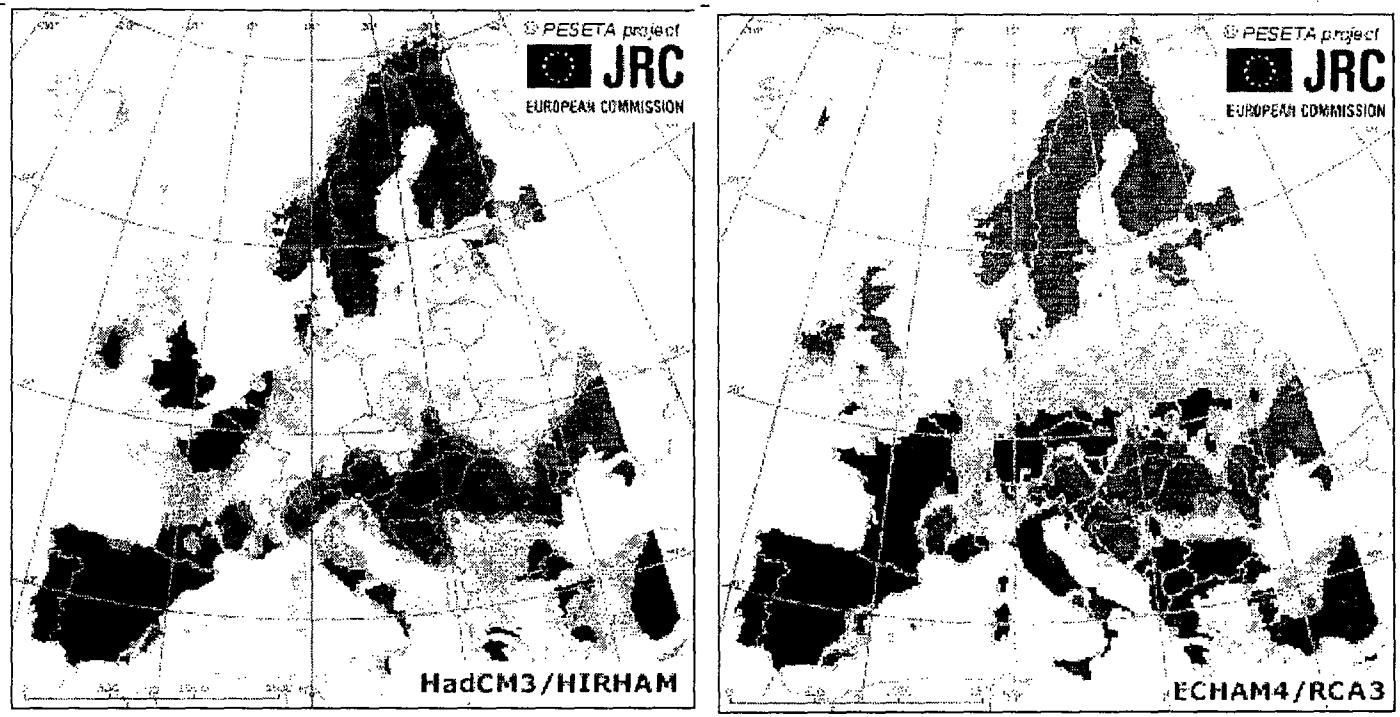
future

- A further lengthening of the growing season is projected
- In western and southern Europe the limited water availability and high temperature will hinder plant growth

Agriculture and forestry

- In summer of 2003 economic losses to farming, livestock and forestry from the combined effects of drought, heat stress and fire were EUR 10 billion

past



Projected crop yield changes (%) between the 2080s and the reference period 1961-1990 by two models and A2 scenario

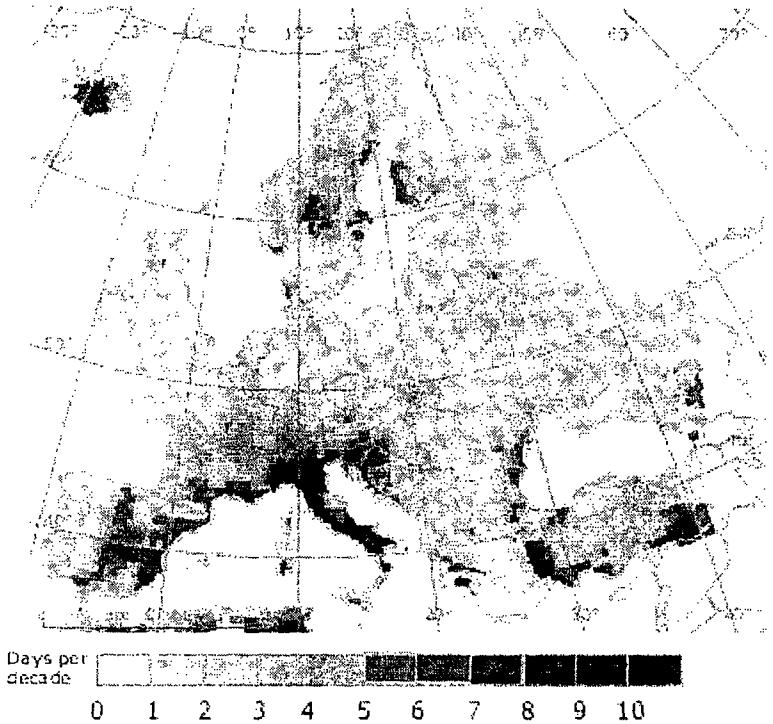
- Economic consequences of climate-related increases in crop yields, mainly in northern Europe and reductions in the Mediterranean, are unknown
- Also economic consequences of projected changes in forest growth are unknown

future

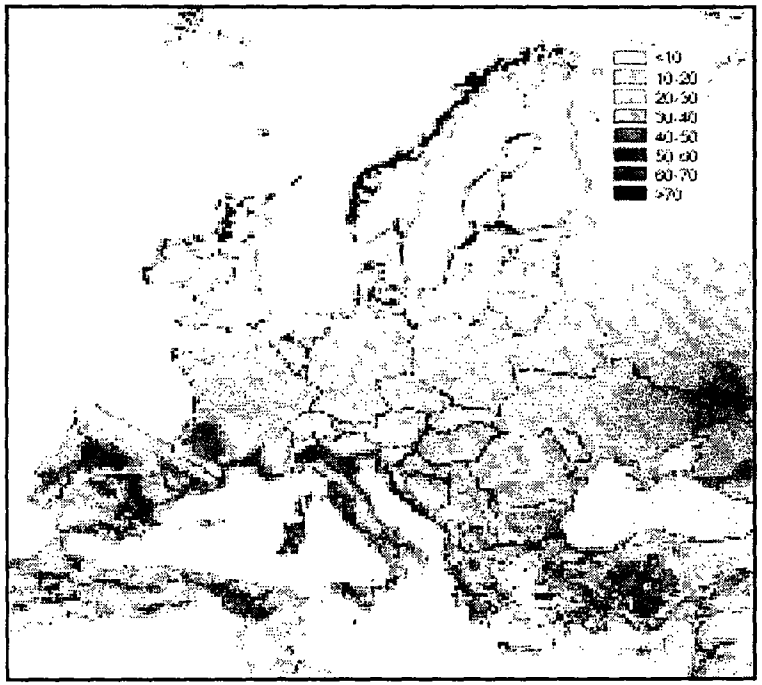
Temperature extremes in Europe

past

- Extremes of cold became less frequent and warm extremes more frequent
- Number of hot days almost tripled between 1880 and 2005



Observed changes in duration of warm spells in summer in the period 1976 - 2006



Projected changes in number of tropical nights between periods 1961-1990 and 2071-2100

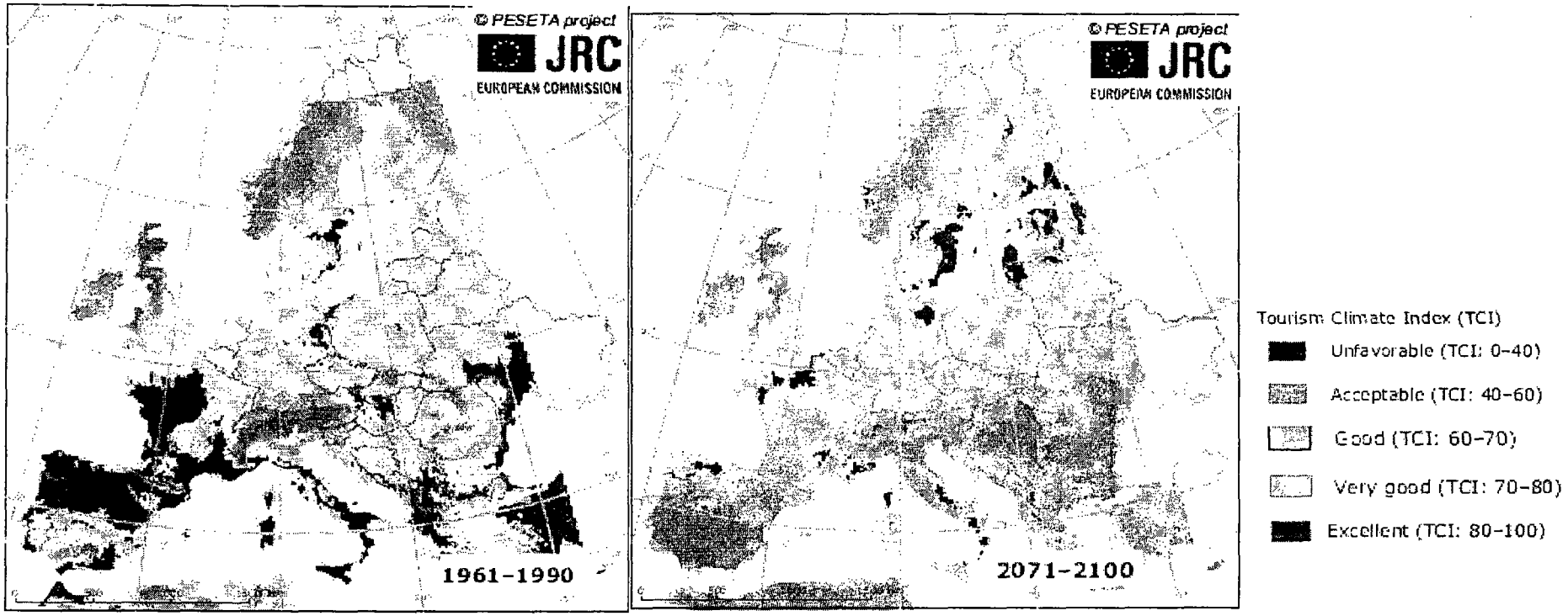
future

- Increase in frequency, intensity and duration of heat-waves
- Further decrease of number of cold days and frost extremes

Tourism and recreation

- Changes in climate reducing the attractiveness of many of the Mediterranean's major resorts, while improving it in other regions.

past



Simulated conditions for summer tourism in Europe (IPCC SRES A2 scenario)

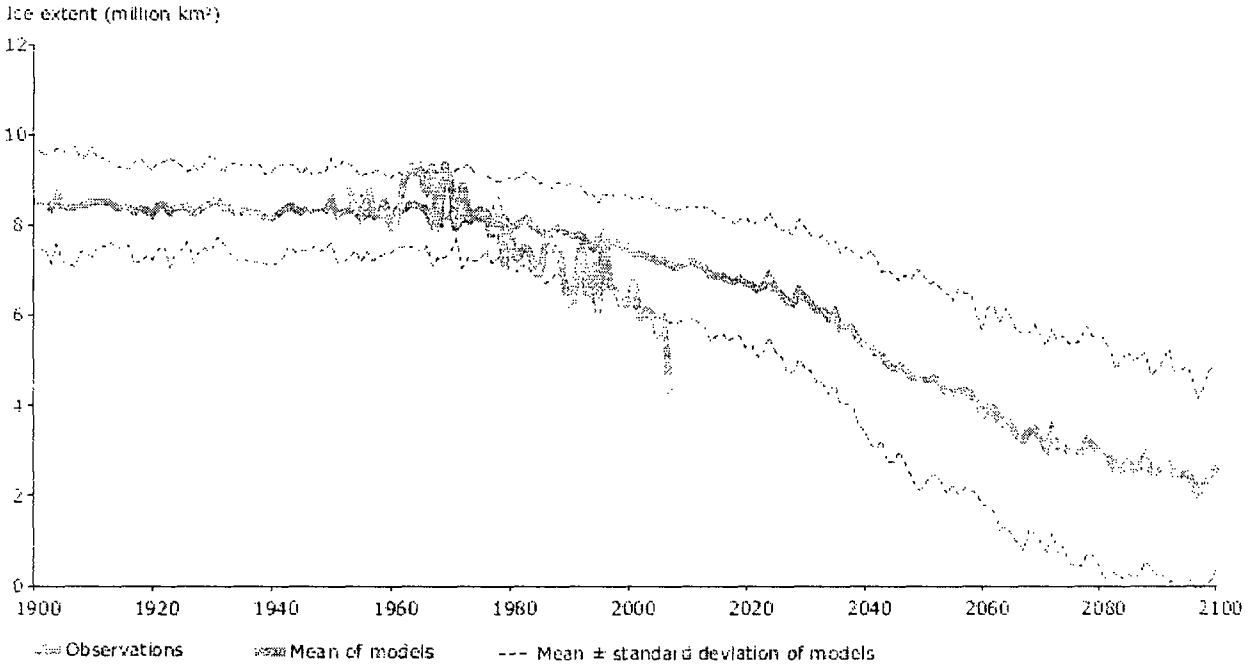
- The suitability of the Mediterranean for tourism will decline during summer, but increase during spring and autumn. This can lead to shifts in the major flows of tourism within the EU.
- Adaptation responses such as economic diversification will be critical to limit economic losses

future

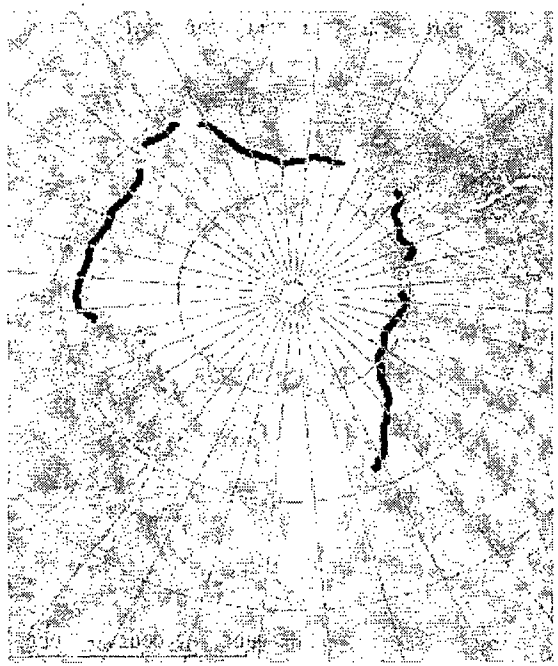
Arctic sea ice

- Arctic sea ice extent has declined at an accelerating rate, especially in summer
- The record low ice cover in September 2007 was half of the size of a normal minimum extent in the 1950s

past



Observed and projected Arctic September sea-ice extent 1900-2100



The 2007 minimum sea-ice extent

- Summer ice is projected to continue to shrink and may even disappear at the height of the summer melt season in the coming decades
- There will be still substantial ice in winter

future

Current national adaptation plans and measures

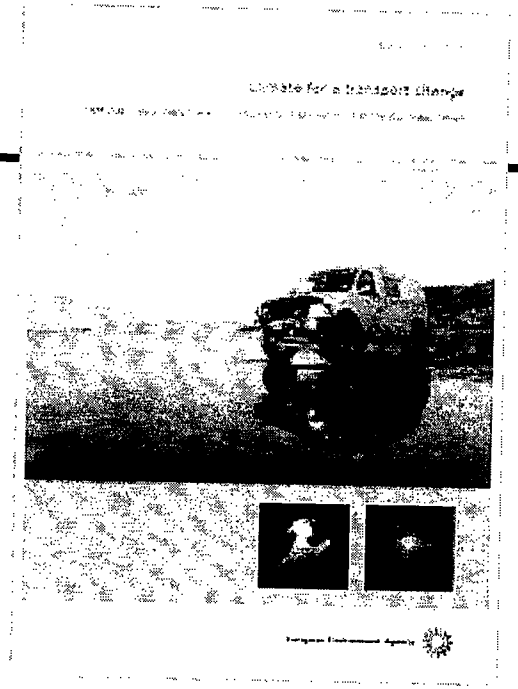
- National adaptation strategies/plans:
  - ***Adopted***: Denmark, Finland, France, Hungary, the Netherlands, Spain, United Kingdom
  - ***Under preparation***: Belgium, Czech Republic, Estonia, Germany, Latvia, Norway, Romania
- Adaptation often focused on flood management and defence
- Scope for other adaptation actions, e.g.:
  - Water demand management (scarcity and droughts)
  - Natural hazard risk management
  - Reinforcing infrastructure
  - Land-use management and spatial planning, greening of cities
  - Ecosystem management
  - Health/heat action plans, health system planning

Thank you for your attention!

http://www.eea.europa.eu

Stephane.Isoard@eea.europa.eu

Transport

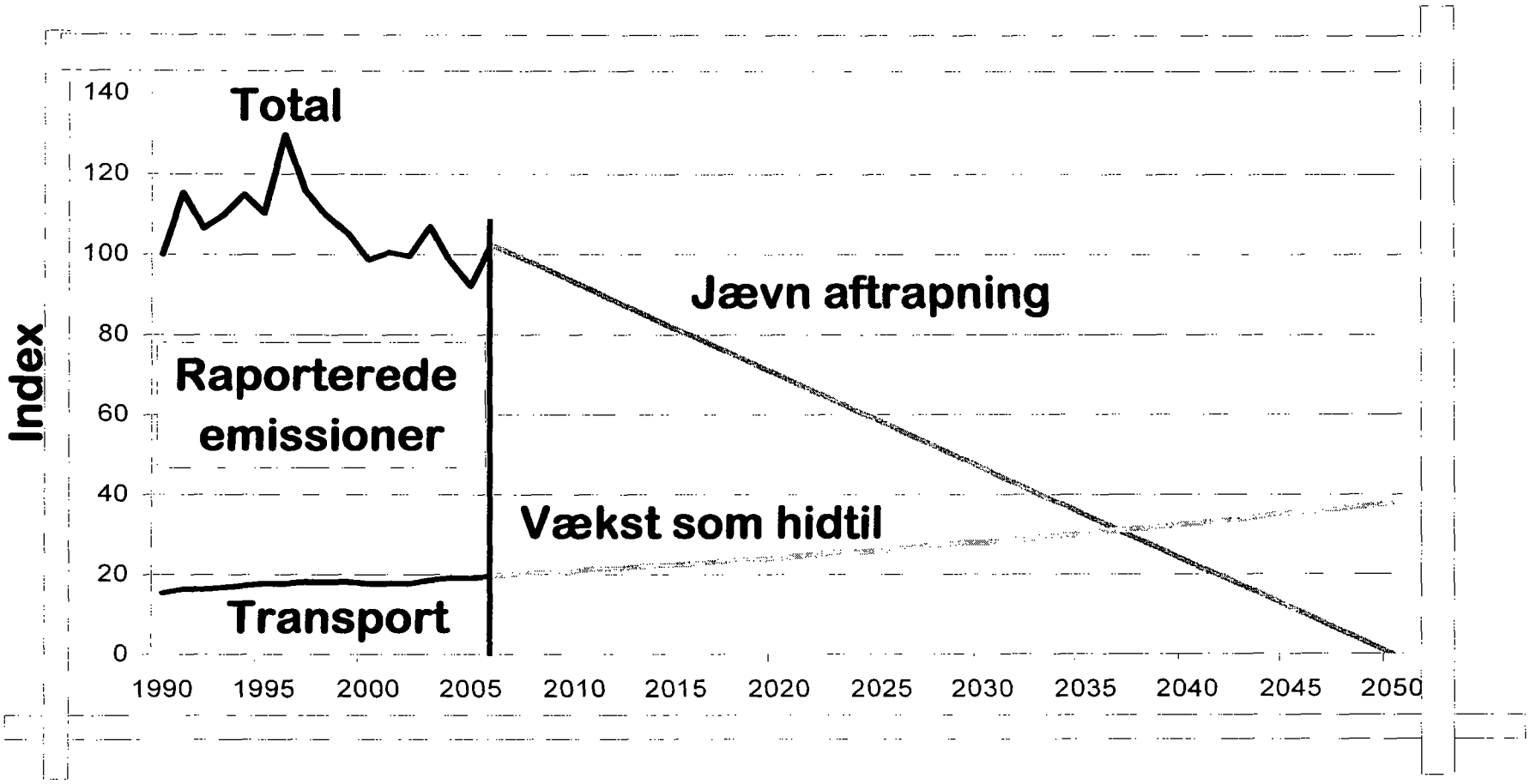


Folketingets miljøudvalg
19 november, 2008

Dr. Peder Jensen
Project Manager, Transport and Environment

Danmark fossilfrit i 2050

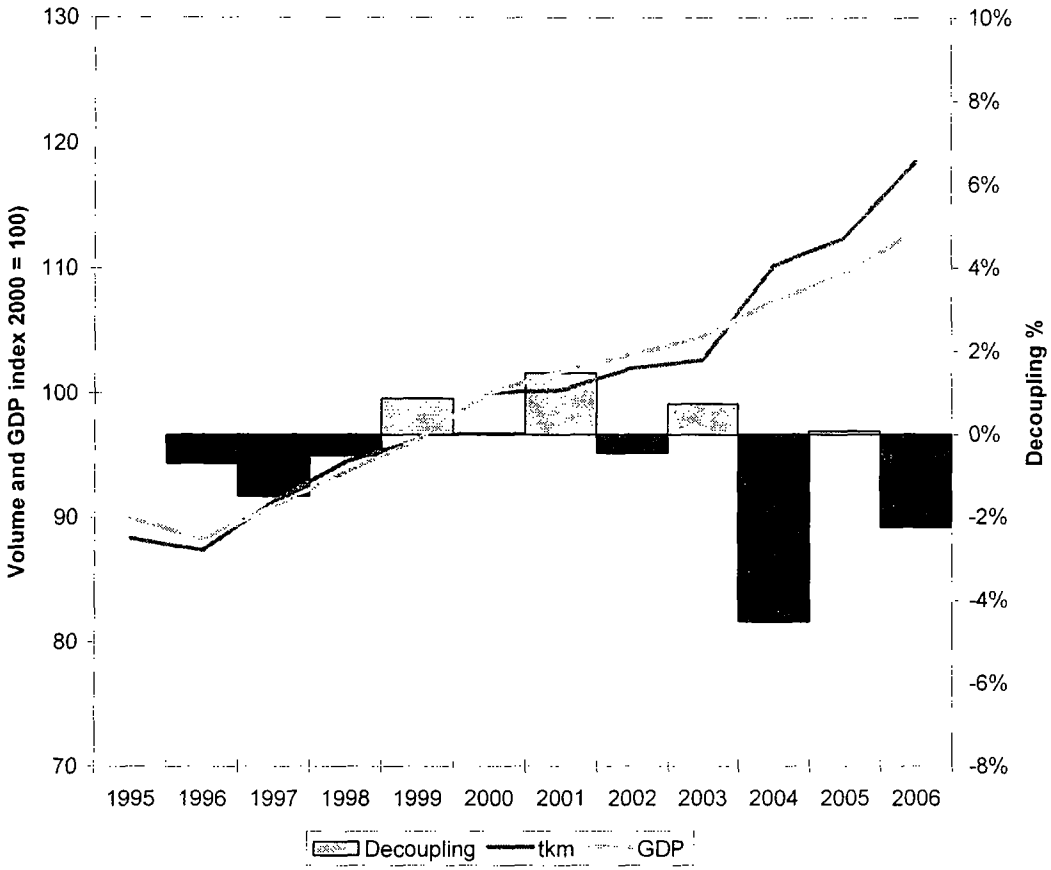
... også transport sektoren



European Environment Agency

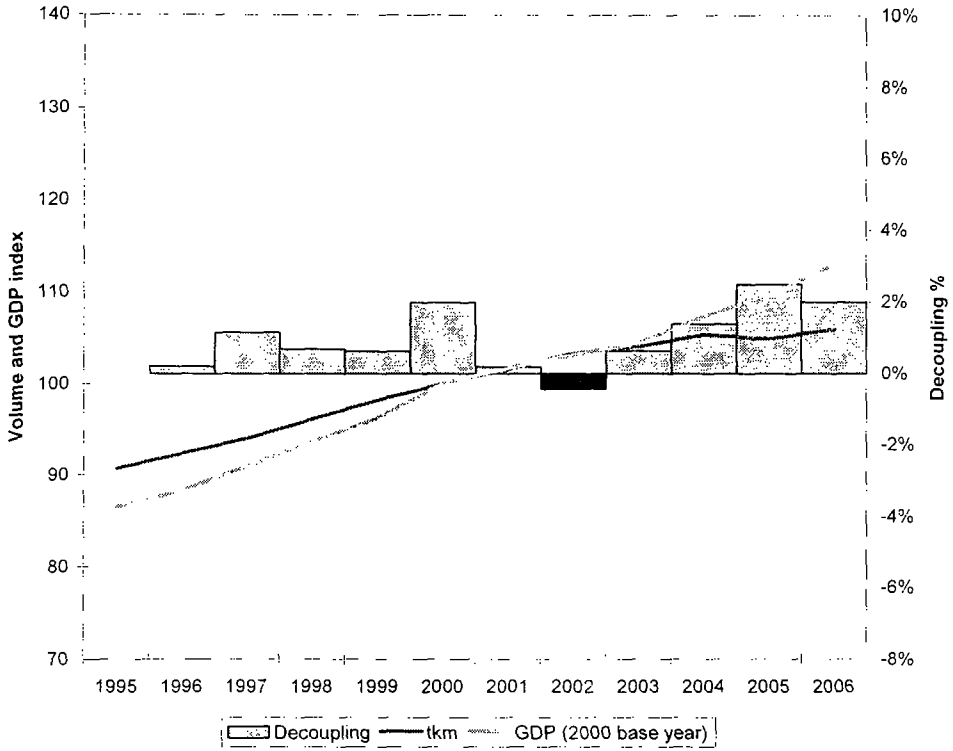
Godstransport og BNP

EEA medlemslande

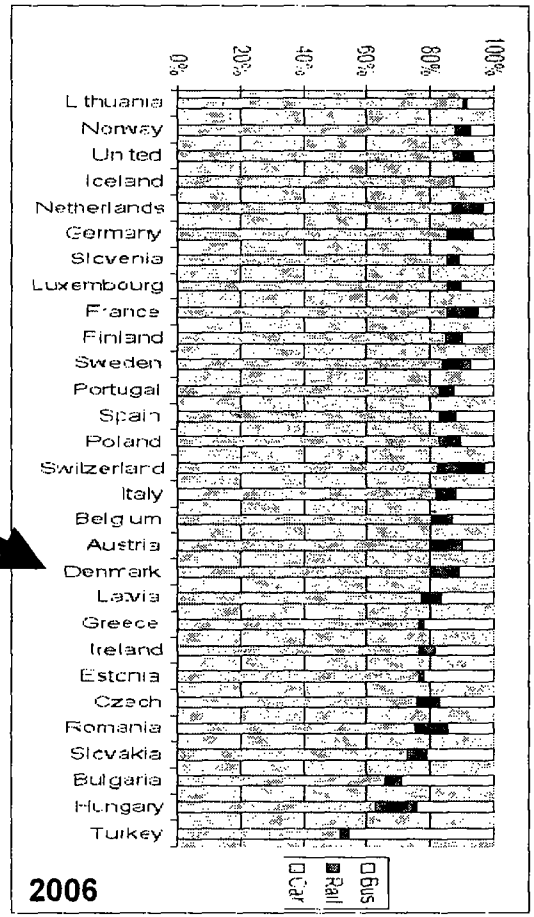


Passager transport

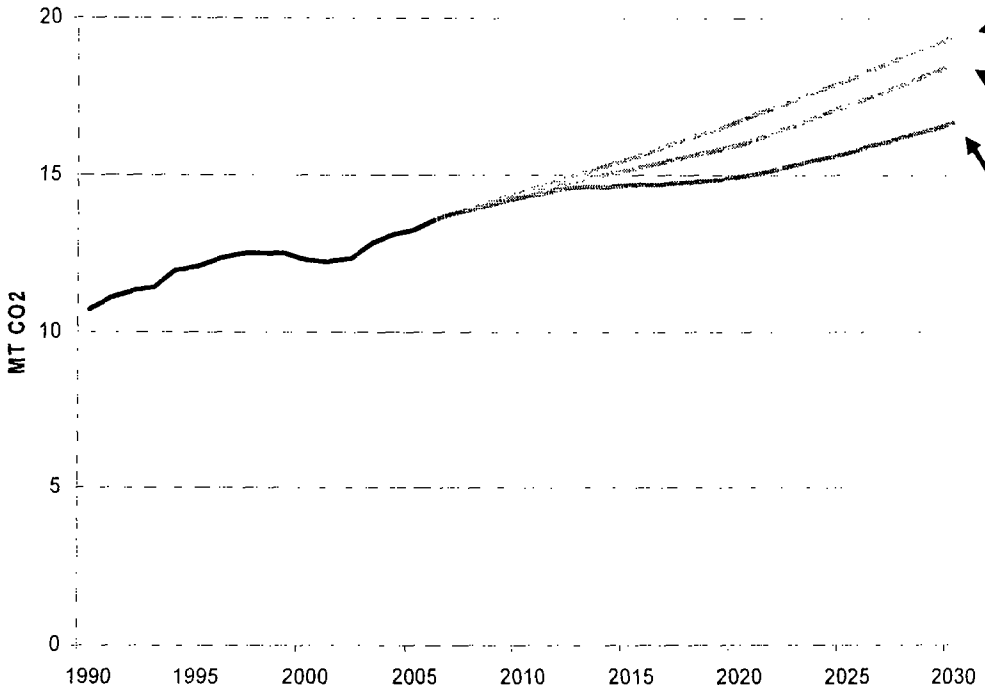
EEA medlemslande



DK



Effekten af biobrændstof og elbiler i Danmark



Fortsat vækst

Biobrændstof

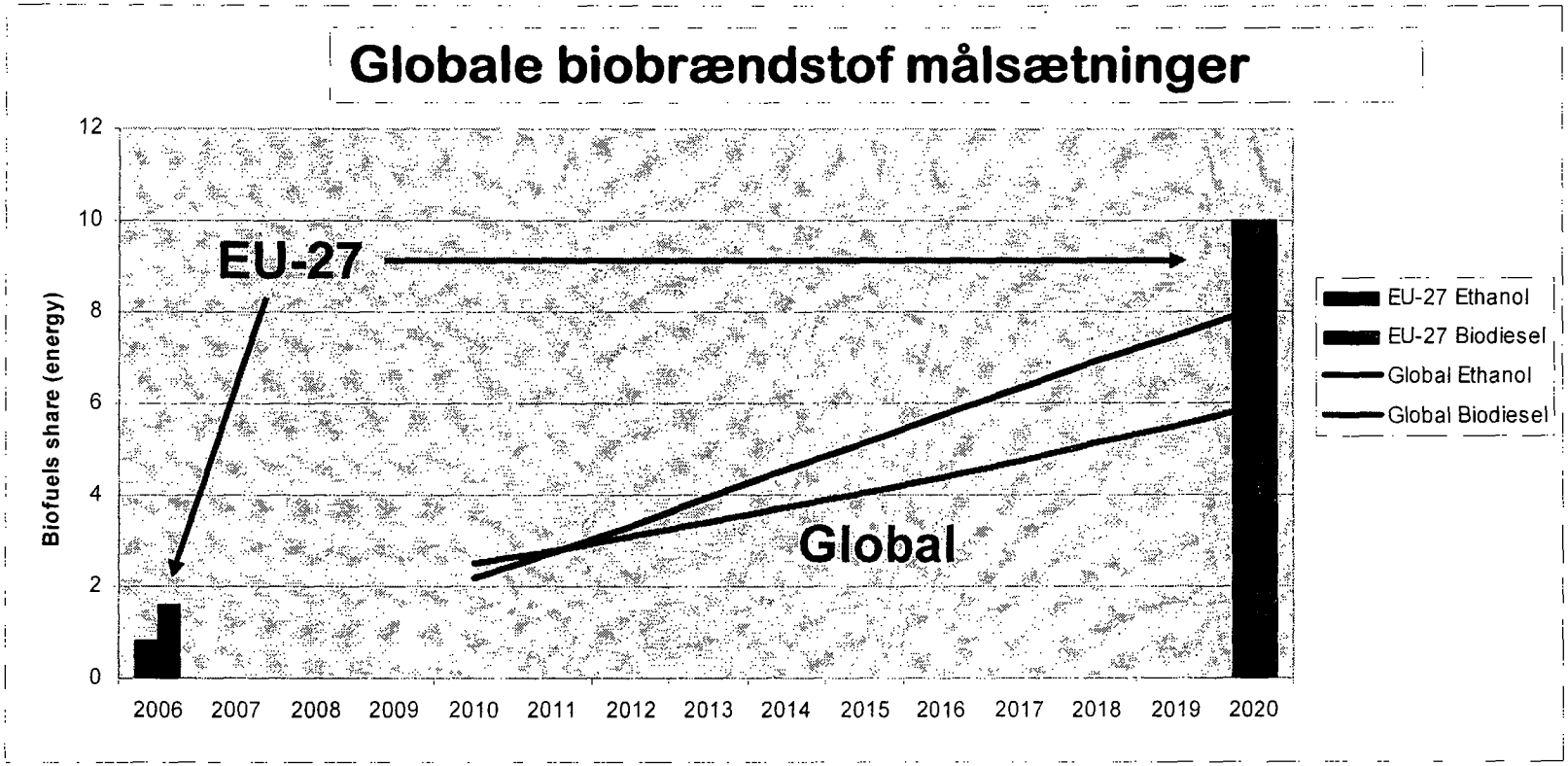
- 10% 2020, 50% CO_2 effekt

Elbiler

- salg 25% af nye biler efter 5 år
- 100% vedvarende energi

Transport emissioner, excl maritim og international luftfart

Biobrændstof og anden vedvarende energi



Source: EEA, 2008

European Environment Agency

Brændstof kvalitetsdirektivet (98/70/EC)

- 10% livs-cyklus besparelse fra brændstof produktion inden 2020
- Raffinaderiforbedringer, max 1-2%
- Reduceret gasafbrænding i produktion
- 10% biobrændstof 2020 giver 4.5% to 9.0% afhængig af produtionsmåde
- Høje oliepriser kan gøre mindre CO_2 venlige produkter økonomisk bæredygtinge

Køretøjseffektivitet i EU

- 130 g CO_2 per km i 2012 ?
- 1995 – 2005: **2.5 g** CO_2 /km /år reduktion
- 2005 – 2007: Ingen reduktion (foreløbige tal)
- 2007 – 2012: **6.0 g** CO_2 /km /år reduktion