Annual Earthwatch lecture - Oxford, 16th February 2009

"Global Citizen observatory - The role of individuals in observing and understanding our changing world"

Professor Jacqueline McGlade
Executive Director
European Environment Agency

The EEA mission

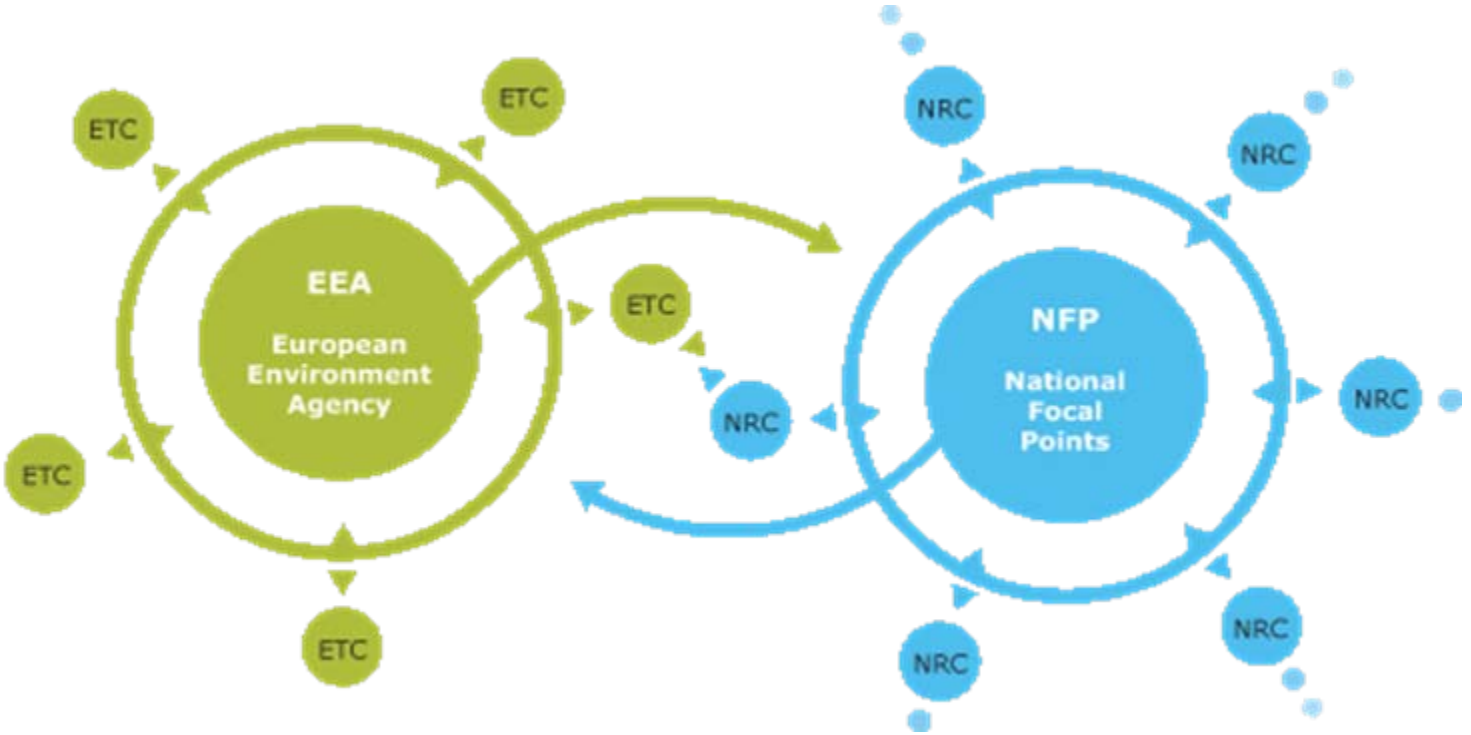
The European Environment Agency is the EU body dedicated to providing sound, independent information on the environment

We are a main information source for those involved in developing, adopting, implementing and evaluating environmental policy, and also the general public

32 Member countries

5 Collaborating countries

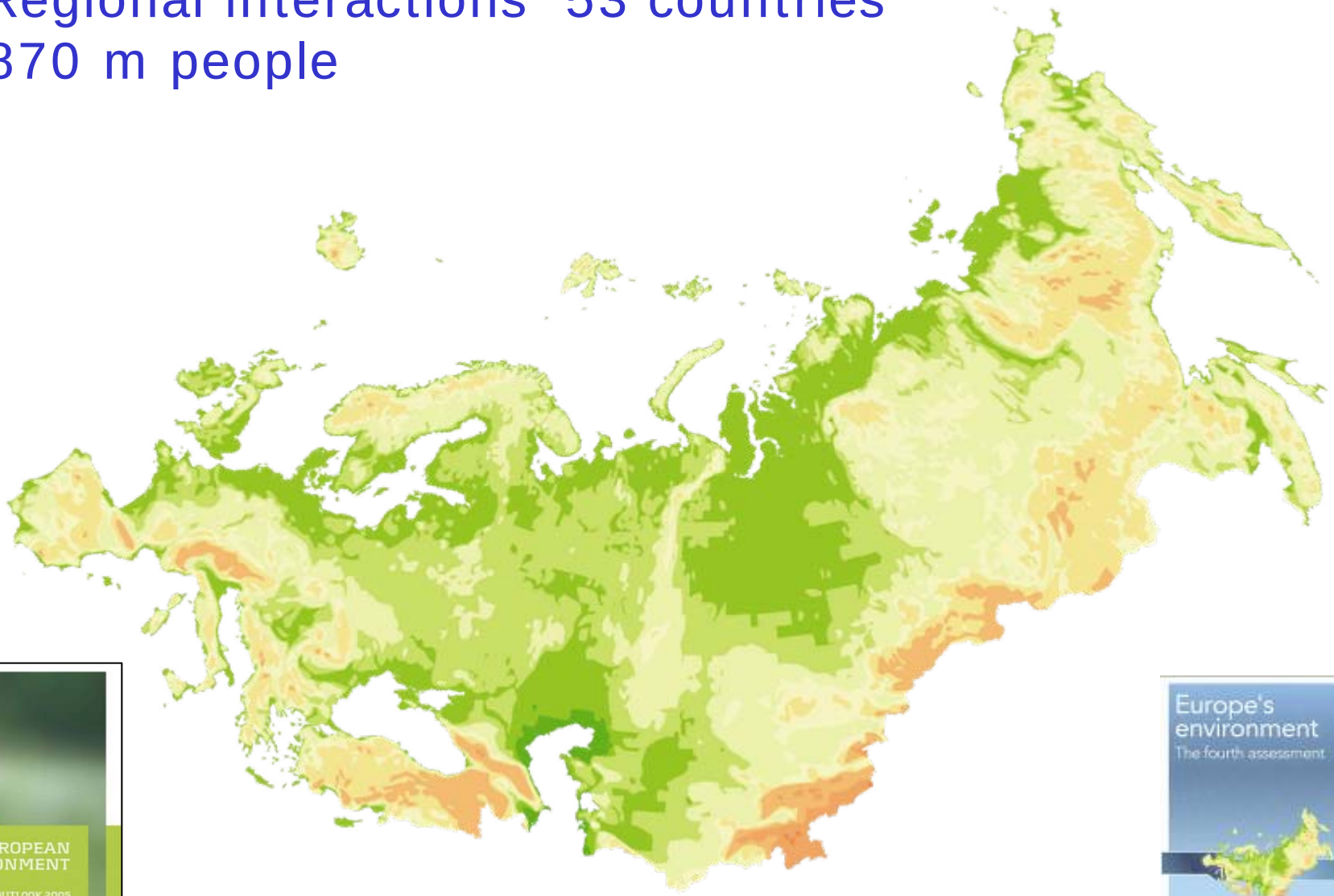
Eionet - European Environmental Information and Observation Network



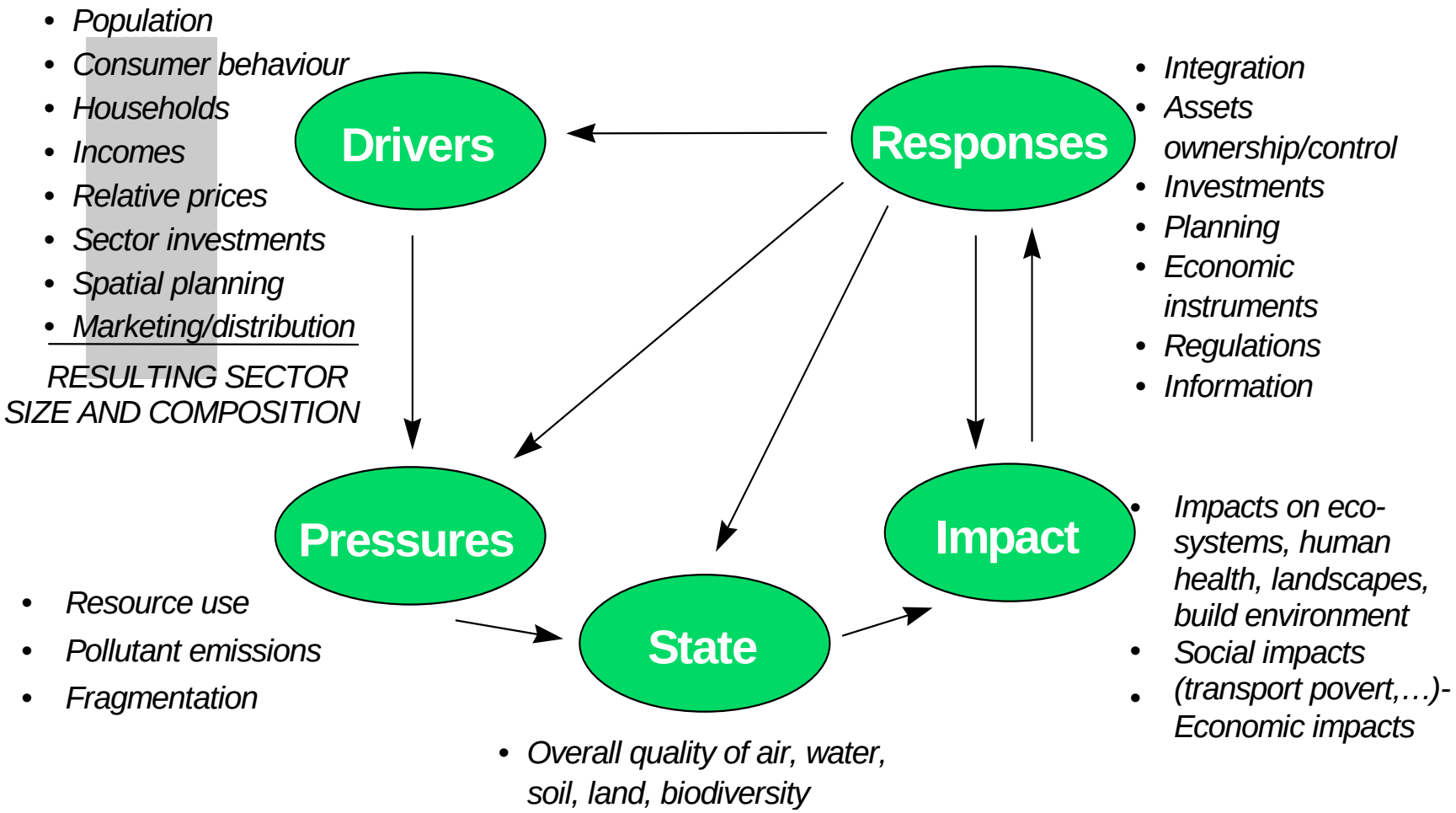
Eionet = A network of around 1900 experts from 37 countries in more than 800 national organisations, consisting of:

European Environment Agency
National Focal Points
European Topic Centres
National Reference Centres

Regional interactions 53 countries 870 m people

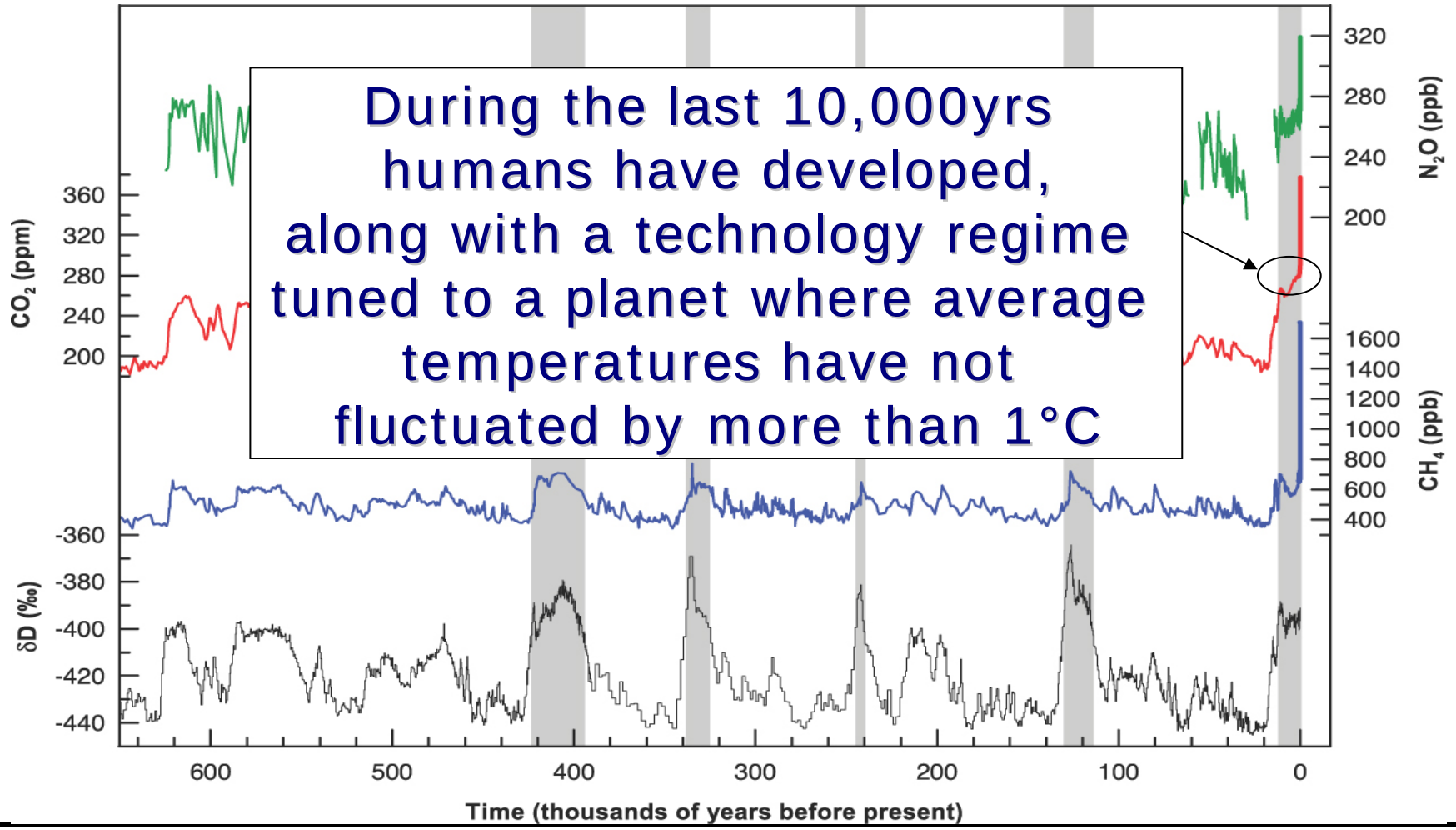


The DPSIR framework for analysing sector/environment interactions



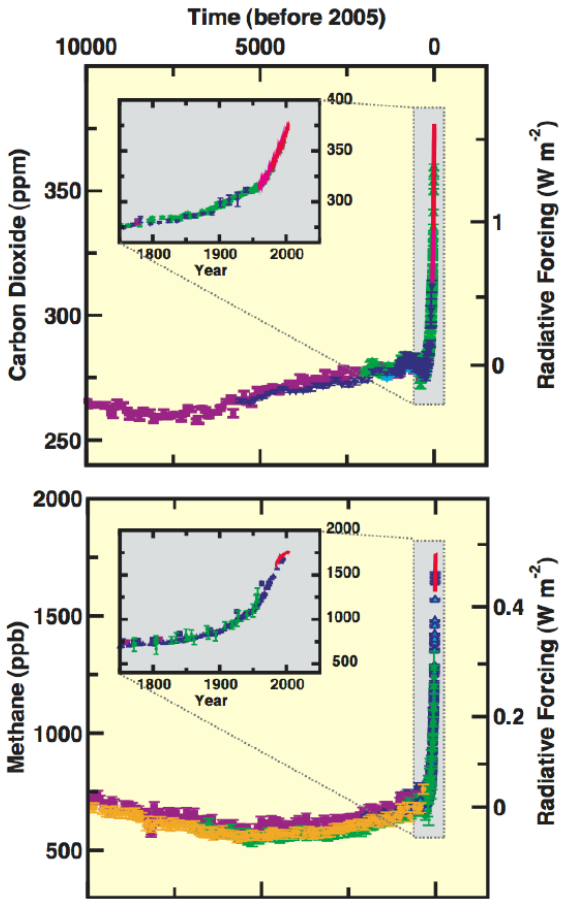
CO_2 concentration over the past 650 000 years

- Due to emissions from human activities the CO2 concentration is 387 ppm (2007), far exceeding the natural range over the last 650 000 years (180 – 300 ppm)

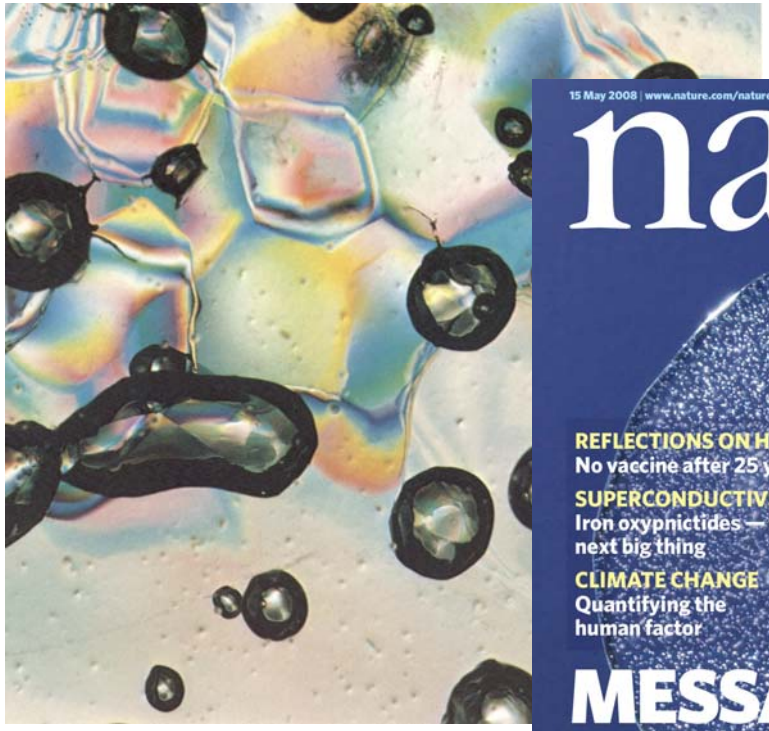


European Environment Agency

CO_2 : higher levels and faster rise



(IPCC, 2007, Fig. SPM-1)



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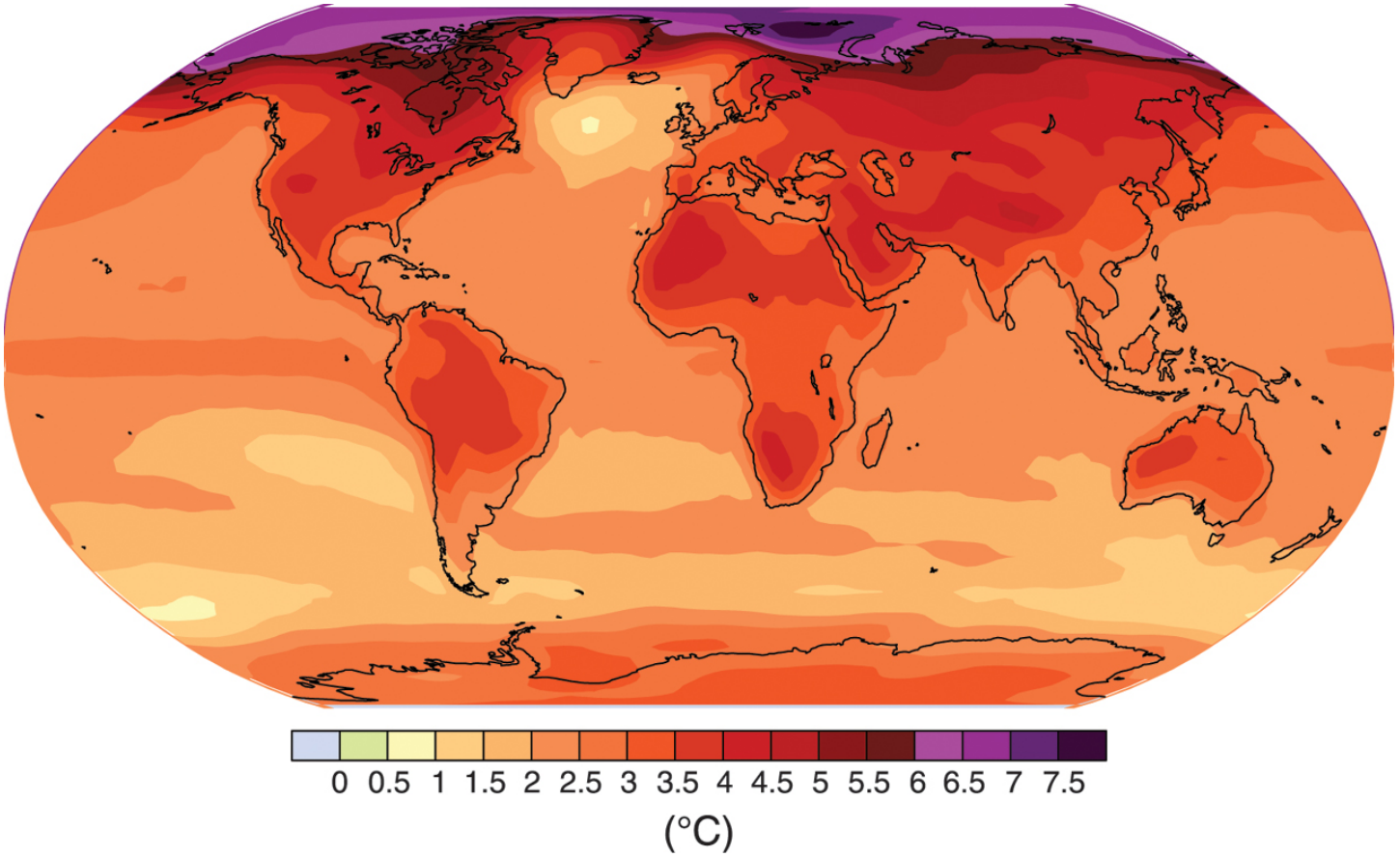
Arctic temperatures have increased at twice global rates in the past 100 years and IPCC projections indicates a similar pattern for the next 100 years

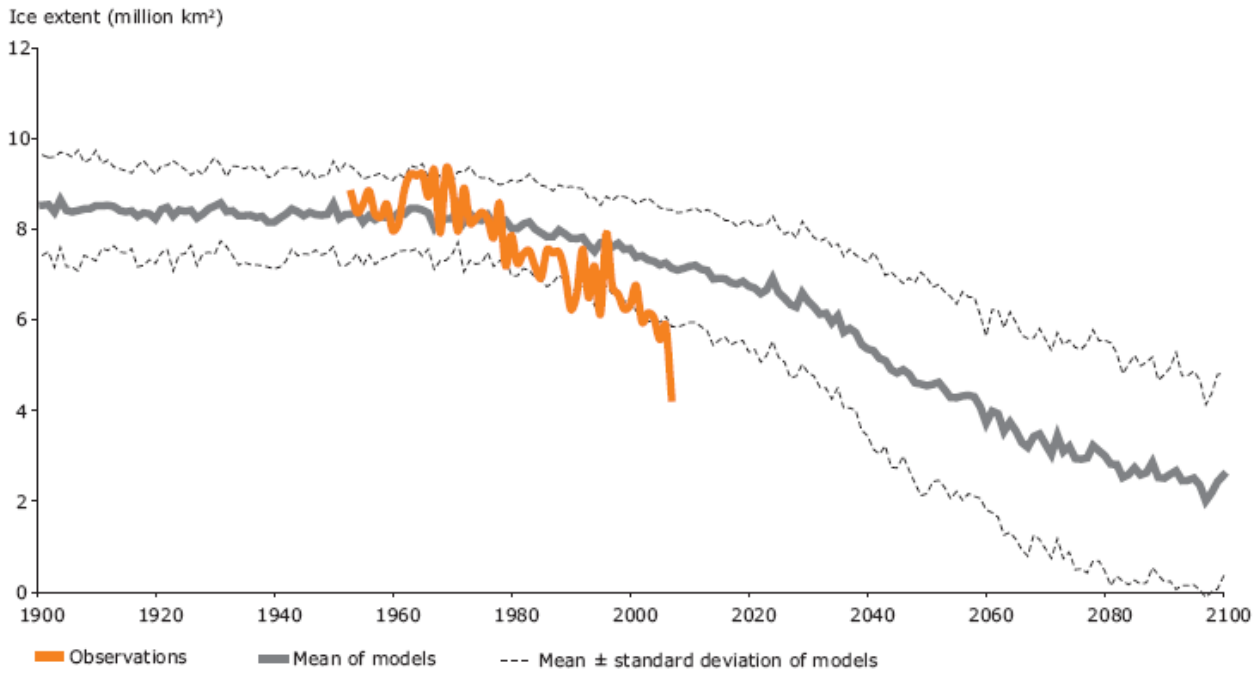


IPPC 2007, End of 21 st century projection (Average A1B SRES scenario)

Arctic sea ice

past

- 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



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

The 2007 minimum sea-ice extent

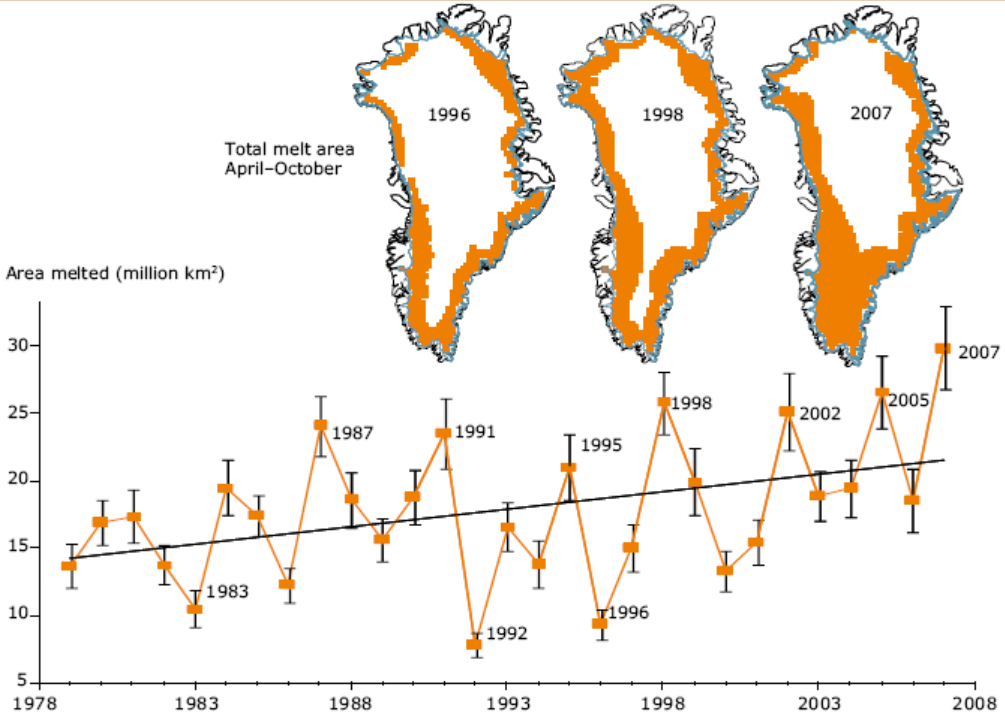
future

- 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

Greenland ice sheet

- The Greenland ice sheet is losing 100 billion tons of ice per year since the 1990s
- The contribution of ice-loss from Greenland to global SLR is estimated at 0.14-0.28 mm/year for the period 1993-2003 and has since increased

past

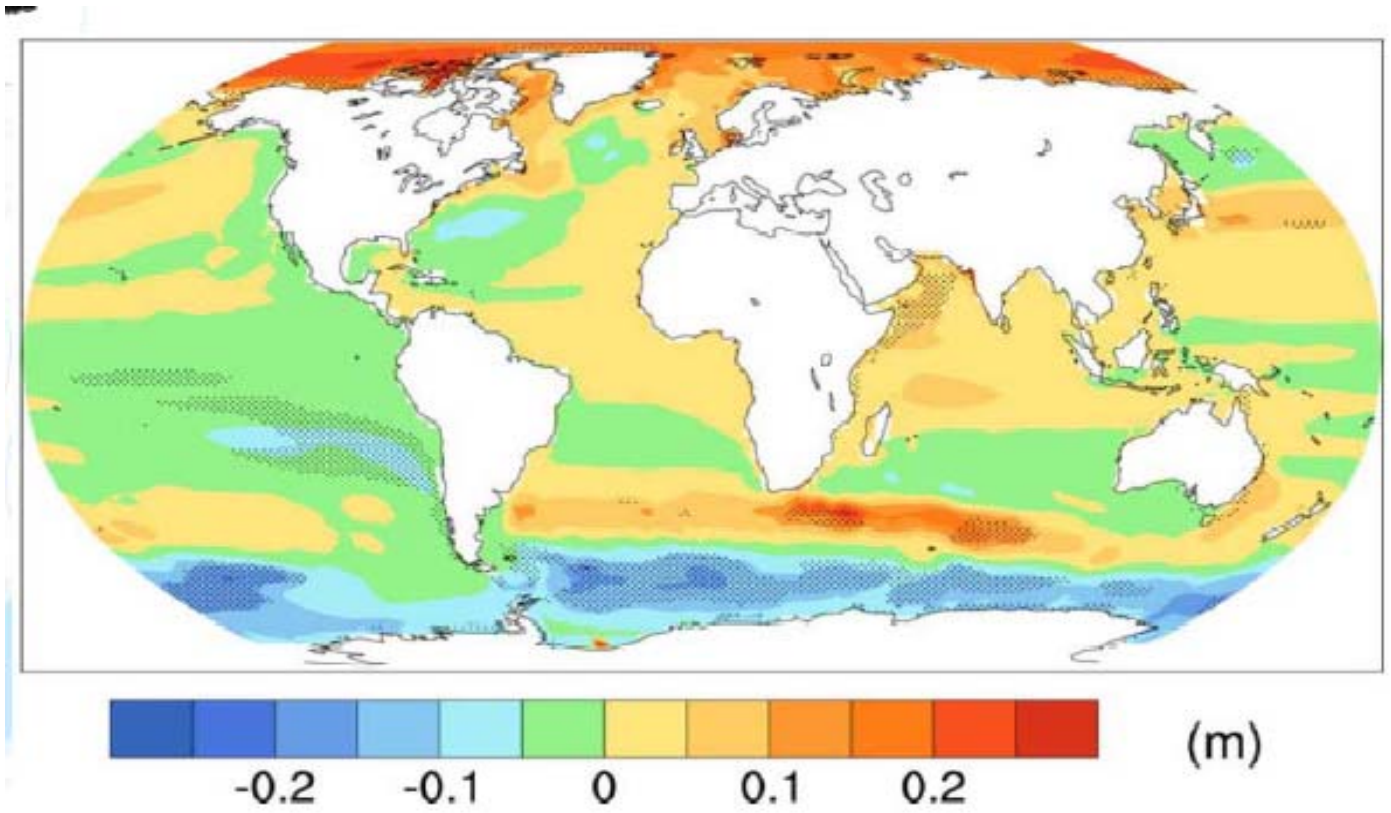


Area of Greenland ice sheet melting 1979-2007

- No reliable prediction of the future of ice sheets can be made, since internal processes are poorly understood
- In the long term, melting ice sheets have the largest potential to increase SLR

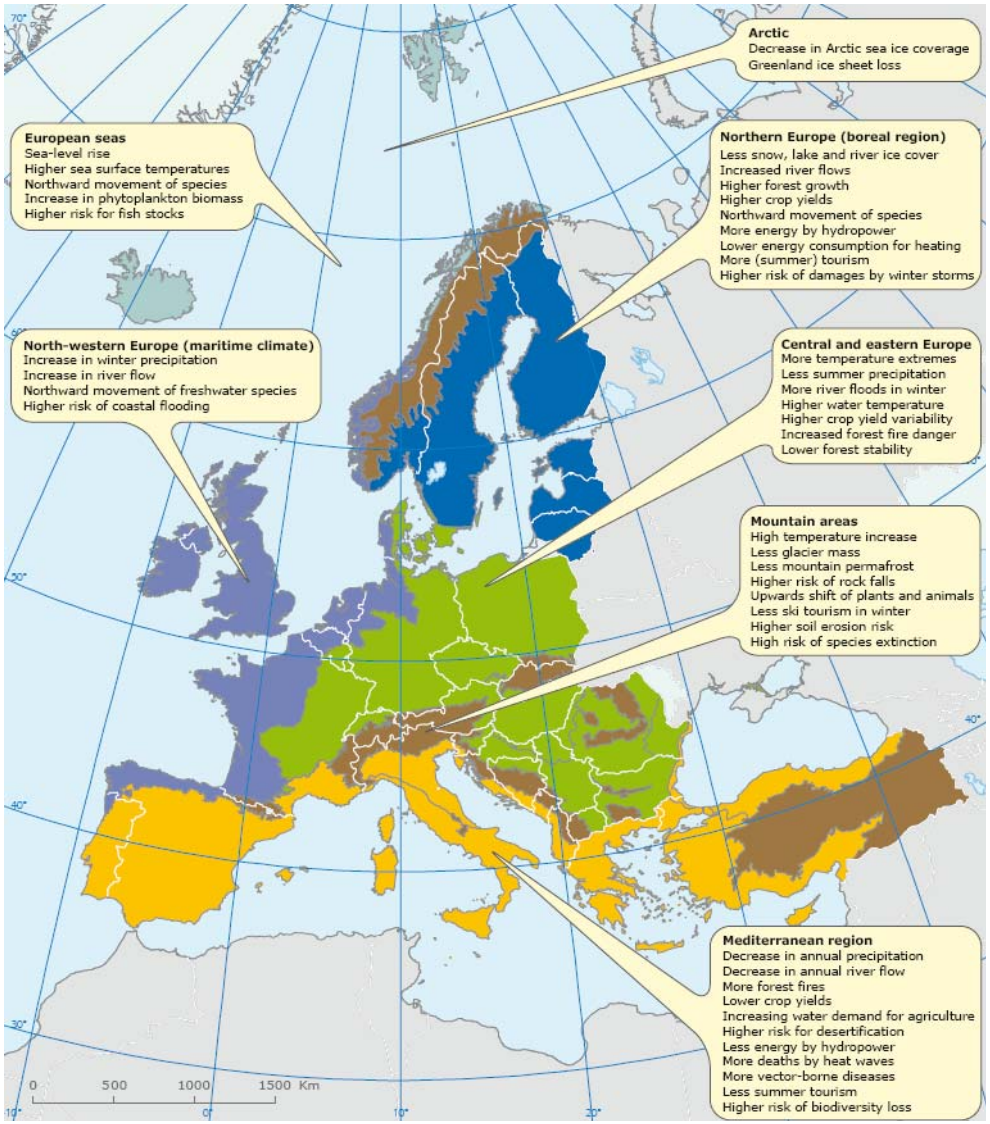
future

Regional sea level rise



Deviations from global mean sea level rise be 2100

Key past and 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

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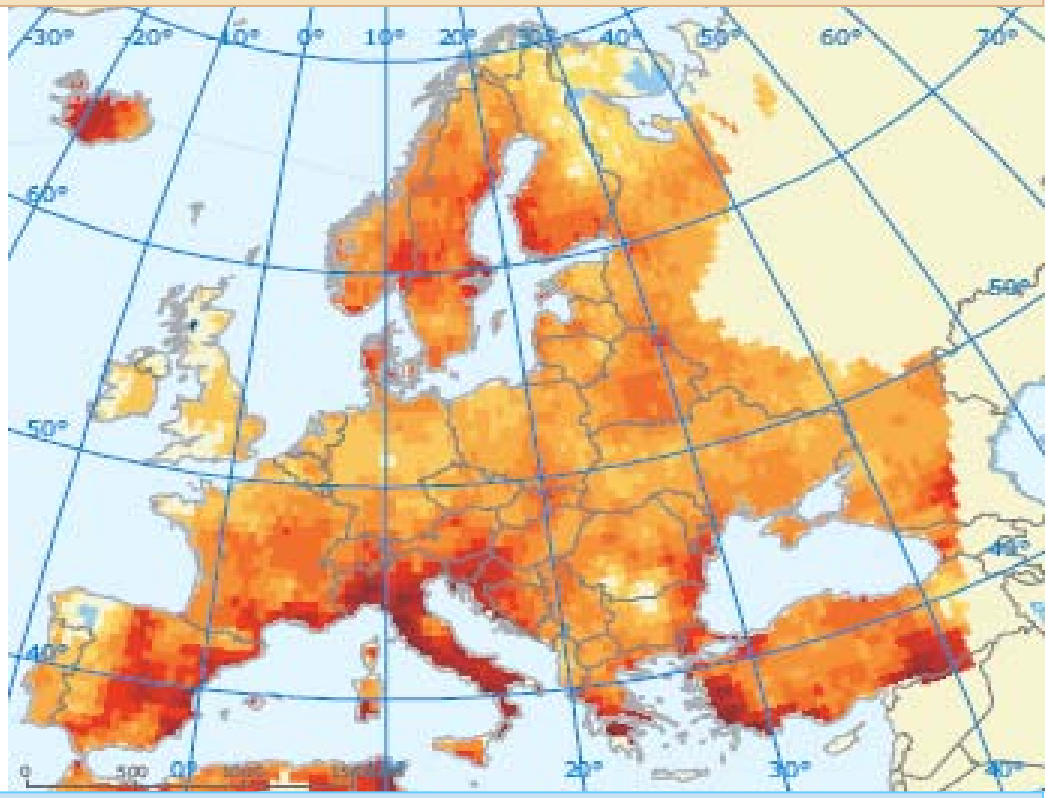
Temperature extremes in Europe

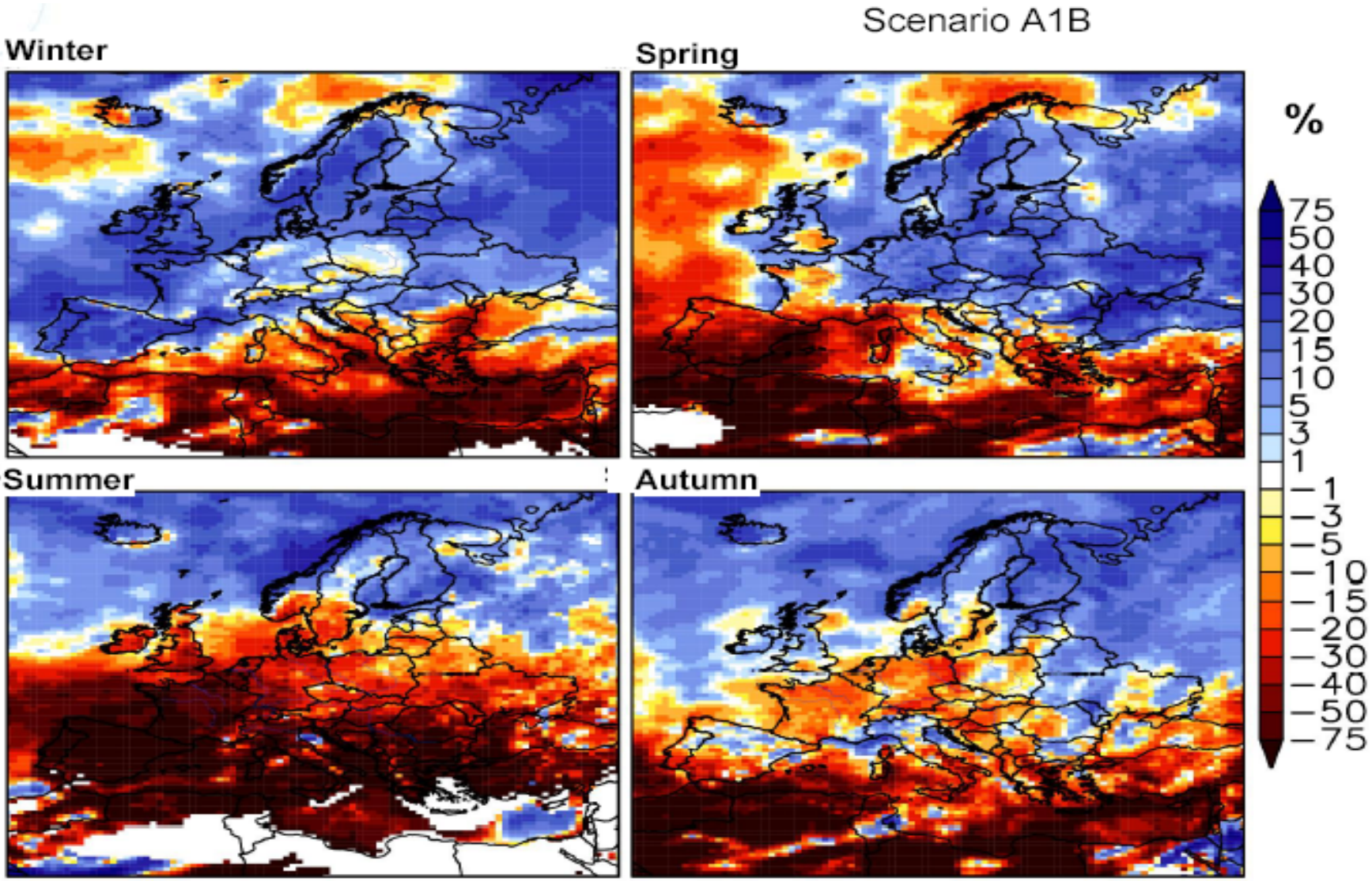
- Extremes of cold became less frequent and warm extremes more frequent
- Number of hot days almost tripled between 1880 and 2005

Observed changes in duration of warm spells in summer in the period 1976 - 2007



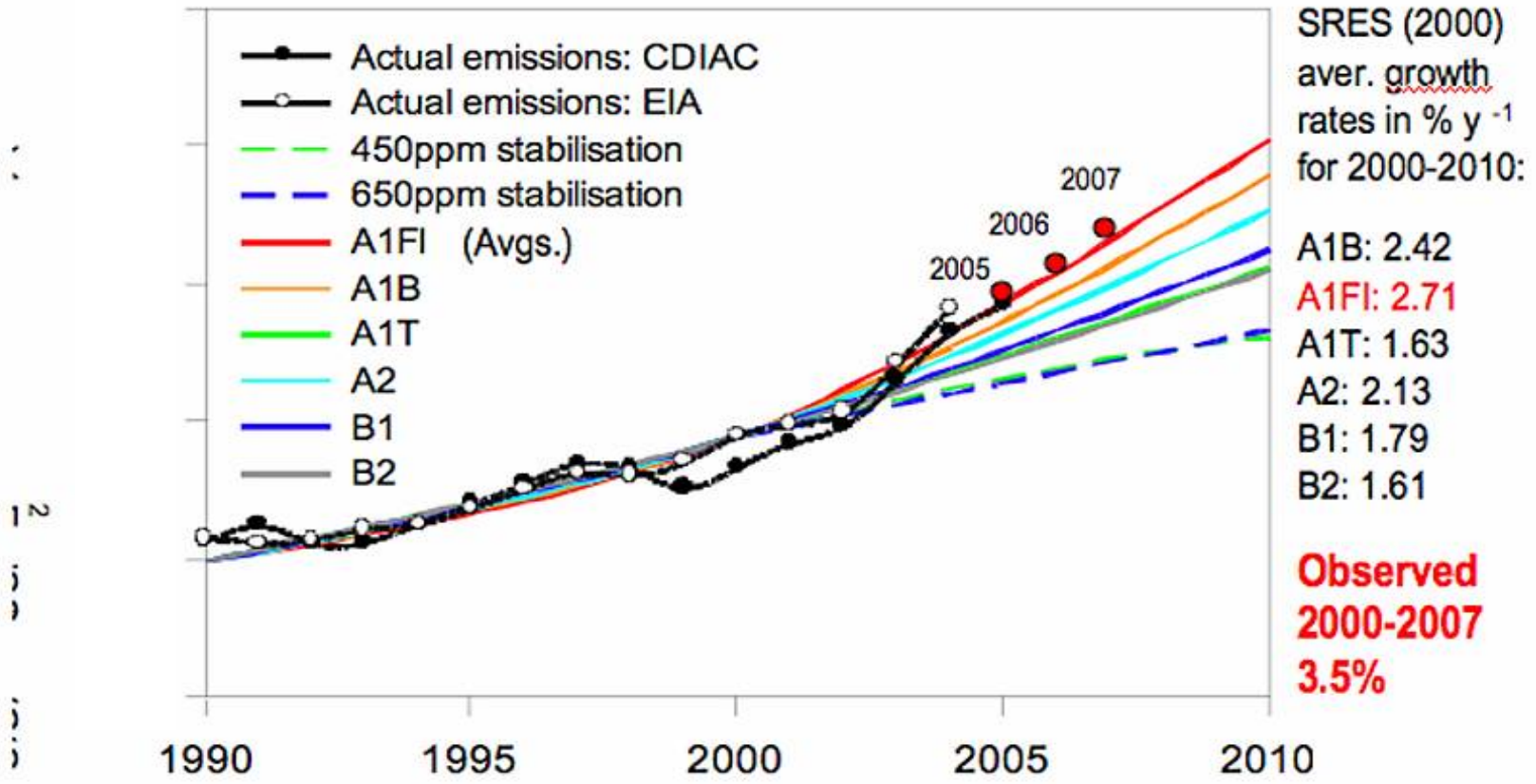
- Increase in frequency, intensity and duration of heat-waves
- Further decrease of number of cold days and frost extremes

Precipitation changes by 2050 - vulnerable regions



Fossil Fuel Emissions: Actual vs. IPCC Scenarios

Note: Red is Business as Usual



Raupach et al 2007, PNAS (updated)

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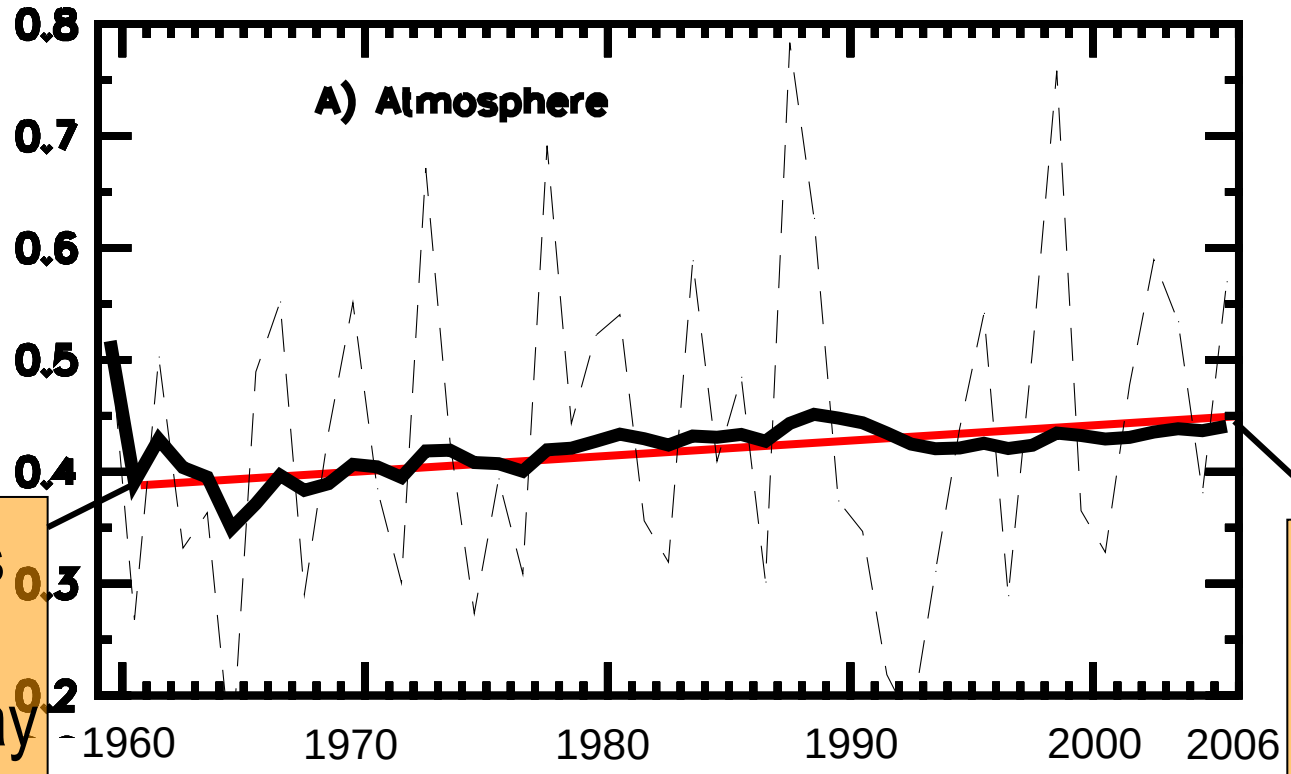
Fraction of all anthropogenic emissions that stay in the atmosphere

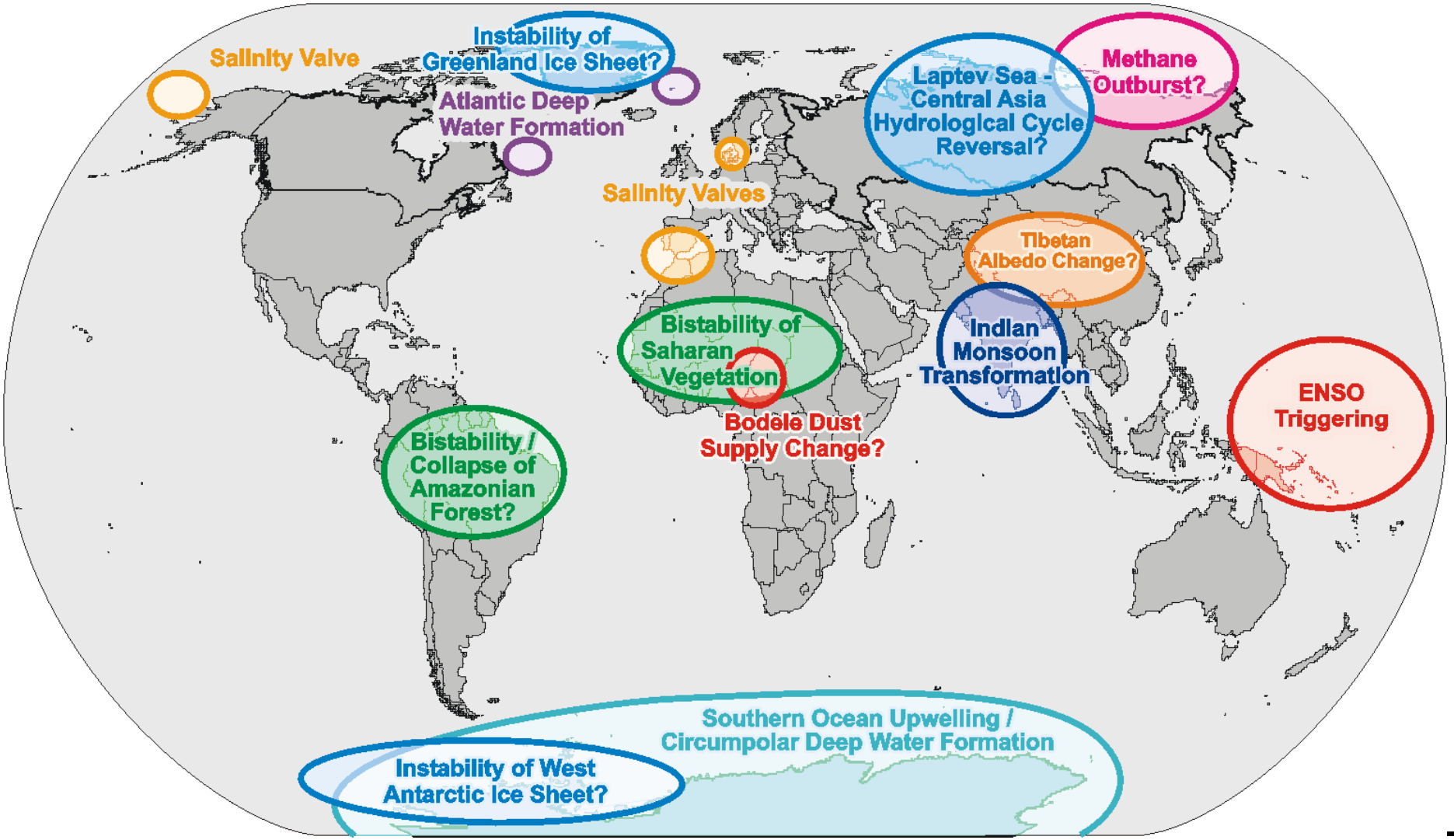


Emissions
1 tCO_2
400Kg stay

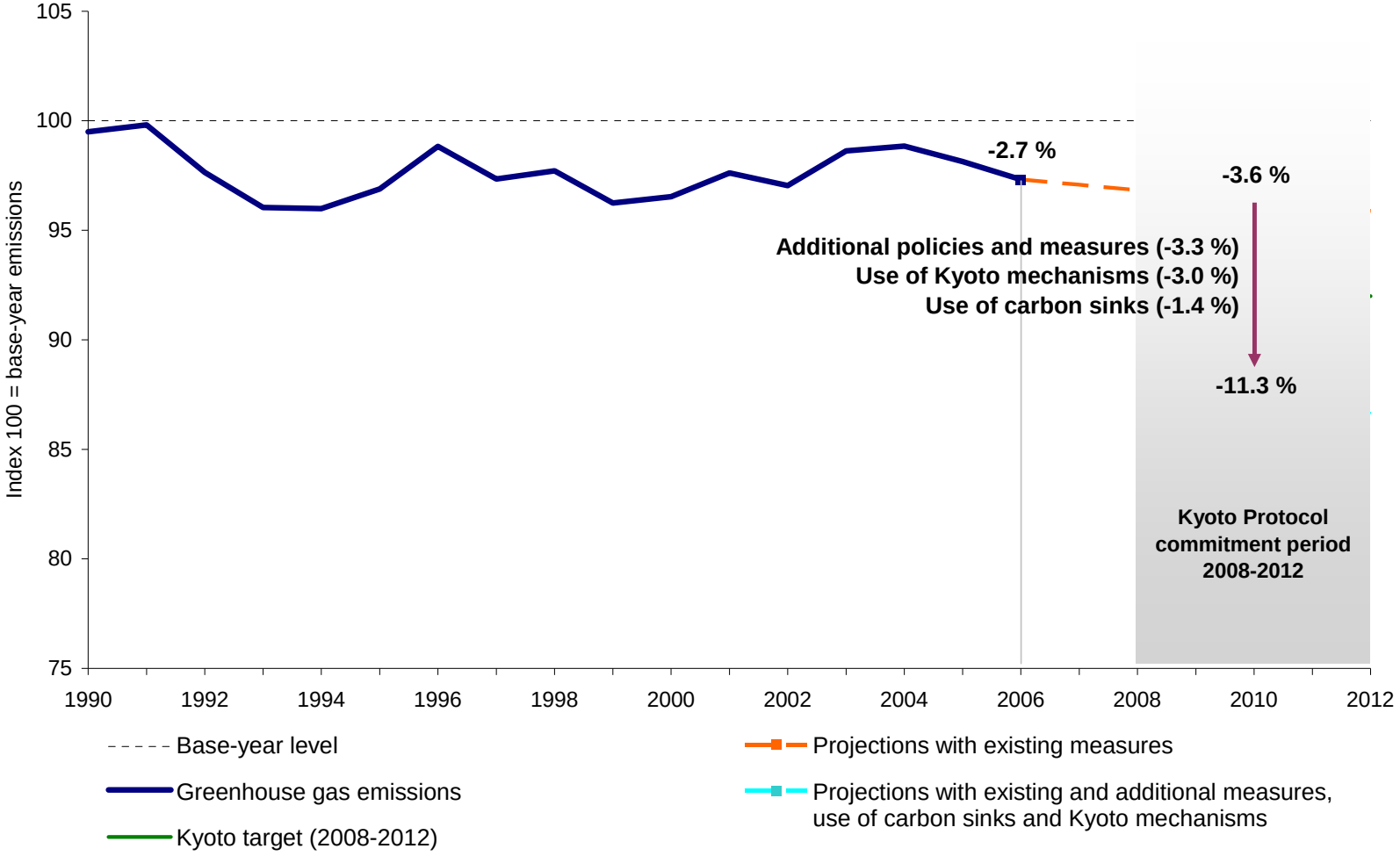
Emissions
1 tCO_2
450Kg stay

Canadell et al. 2007, PNAS

Tipping Points in the Earth System (Schellnhuber)



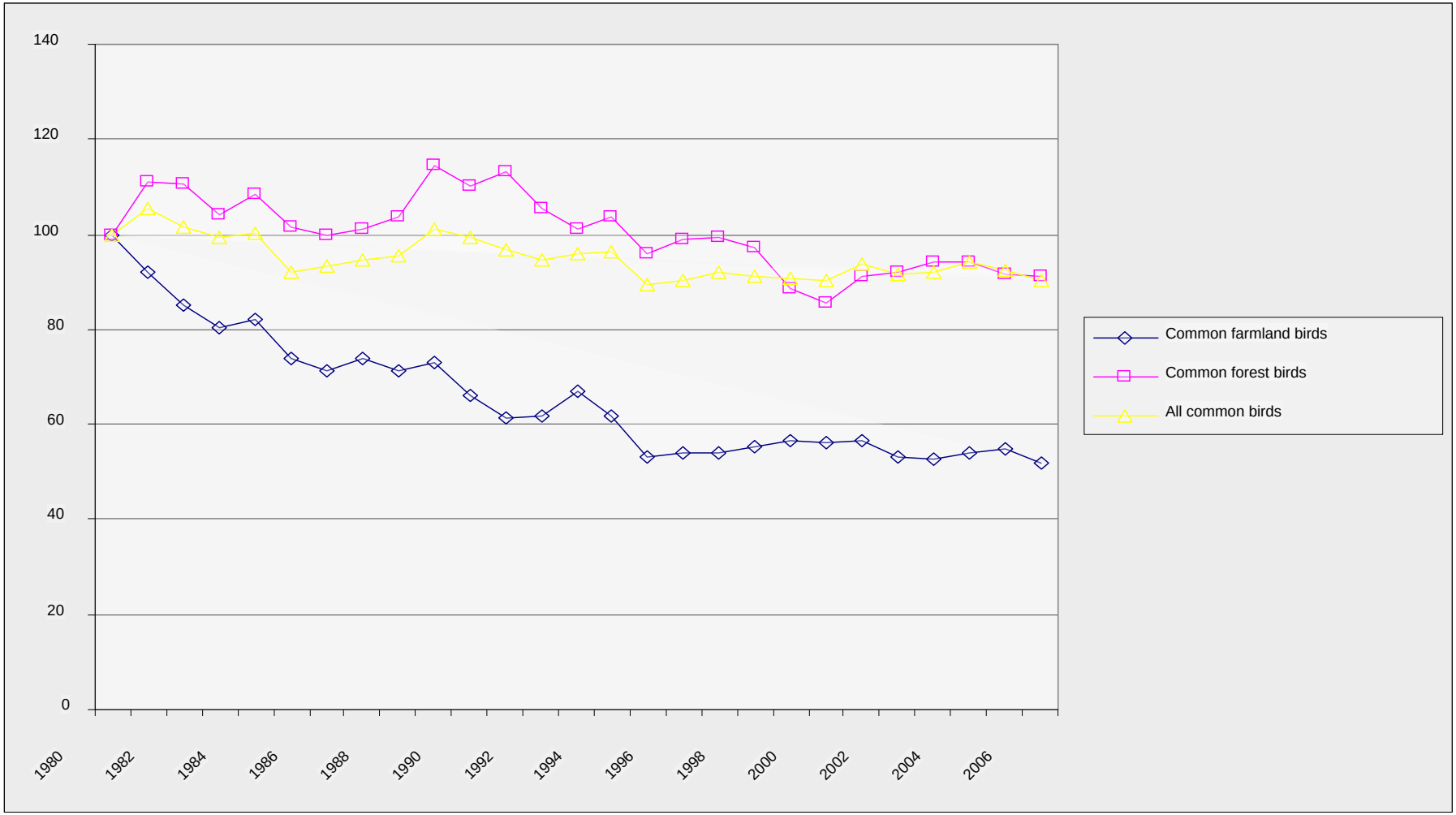
In 2006 EU-15 emissions were above the -8% Kyoto target, but commitments will be achieved by a large margin if all policies deliver



Biodiversity and ecosystems


To conserve our natural assets and protect biodiversity we need to know the positive and negative trends in their overall health

Common birds in Europe, population index (1980 = 100)



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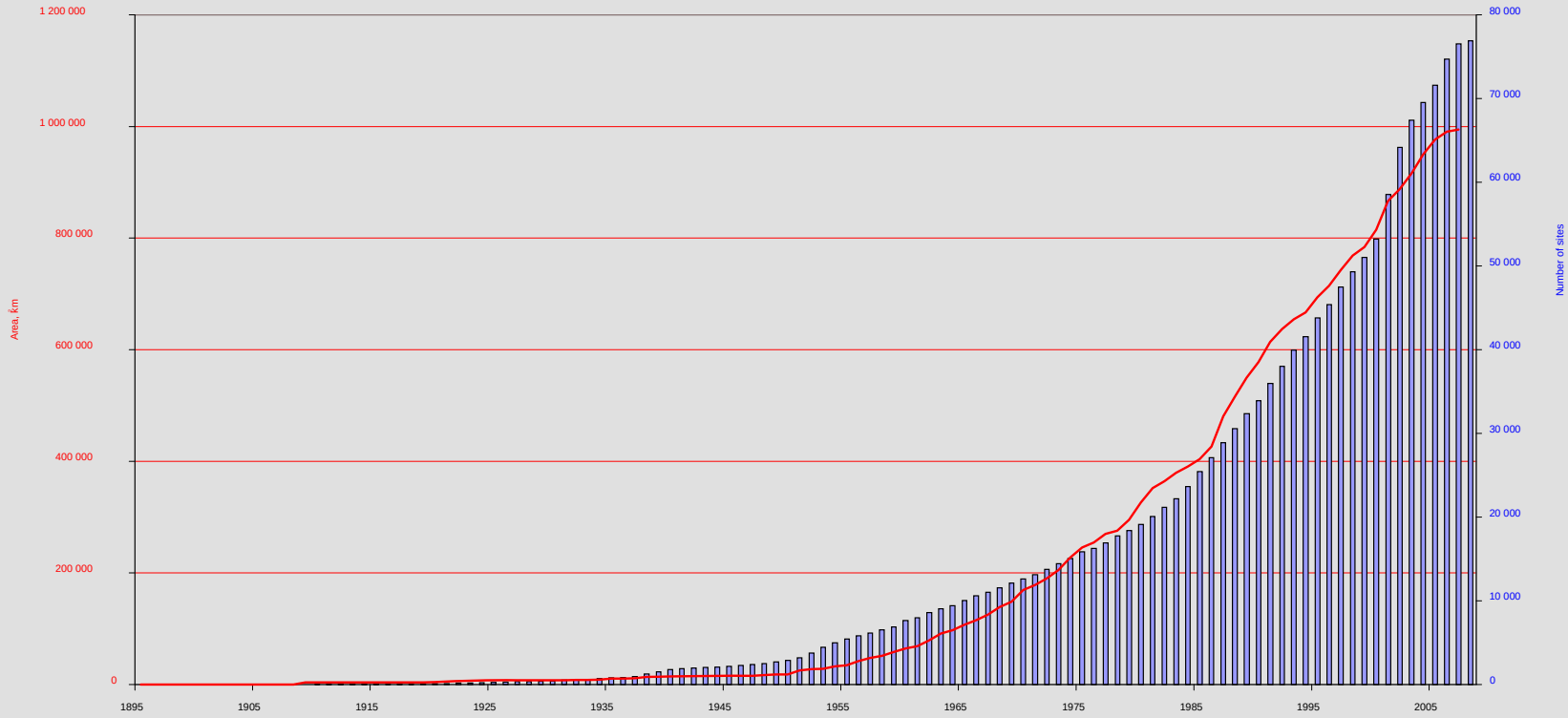
Growth of the nationally designated protected areas in 39 EEA countries

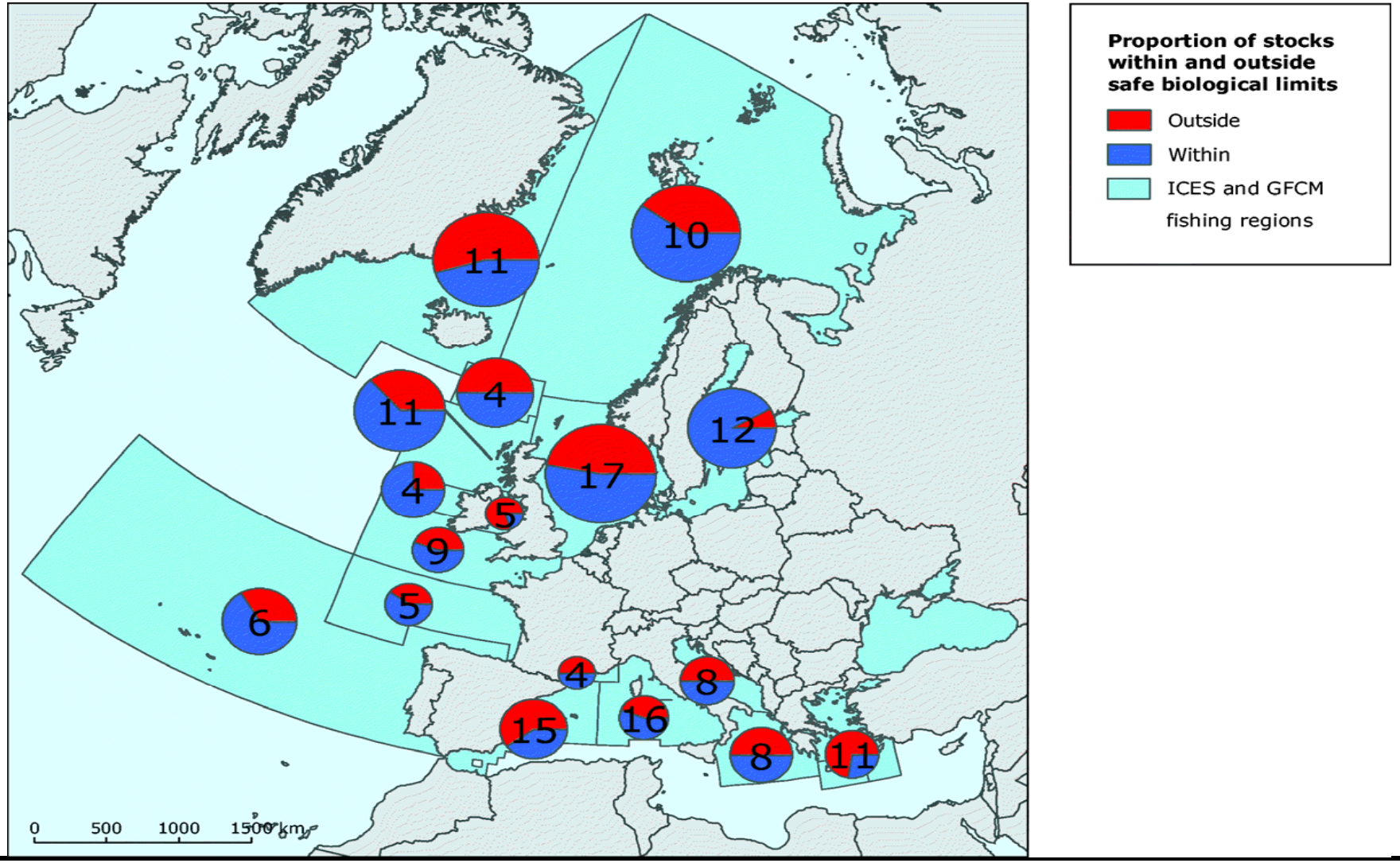
Source – EEA 2009



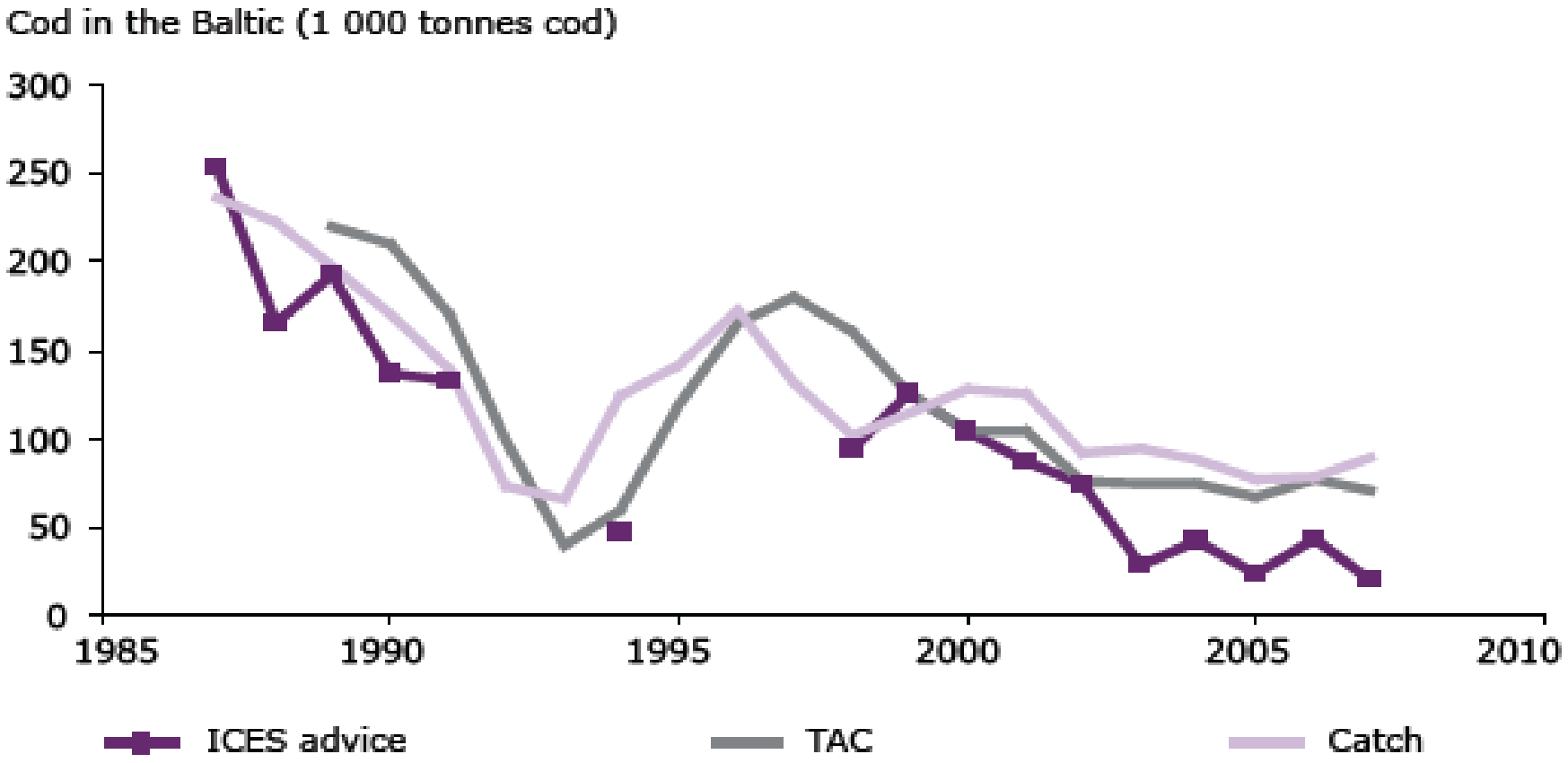
Pollution levels are stable but the state of marine fauna is worrying

Status of the fish stocks in ICES (International Council for the Exploration of the Sea) and GFCM (General Fisheries Commission for the Mediterranean) fishing regions of Europe in 2006 (Ver. 8.00)

Source - EEA 2009



Graph of stock development from Signals report 2009



Scientifically recommended catch levels (based on ICES advice), agreed total allowable catch (TAC) and actual catch in the fishing areas around Bornholm, in the years 1989-2007. In almost every year when the cod stock has been assessed, the TAC has been set higher than the recommended level. Source: EEA, 2008.

The three systemic crises

- Systemic multiple crises: finance/real economy, energy/climate, ecosystem/biodiversity, social
- Trust crisis: exposure of concealed debts (including ecological debt which is not even recorded in accounting books)
- Governance crisis: responses are a series of untested rescue packages and trial and error solutions

Common features of these 3 systemic crises:

- Making money from money

- Over consumption

- Capital destruction

COMMON FEATURES	FINANCIAL CRISIS	CLIMATE CRISIS	NATURAL RESOURCES CRISIS
CAPITAL DESTROYED			
Financial	YES	YES	YES
Human	YES	YES	YES
Natural	YES	YES	YES
Social	YES	YES	YES
RISKS / DEBTS PASSED ON TO CURRENT AND FUTURE 'OTHERS'?	YES	YES	YES

COMMON FEATURES	FINANCIAL CRISIS	CLIMATE CRISIS	NATURAL RESOURCES CRISIS
MARKET PRICES: Cover All costs?	NO	NO	NO
Reflect real risks?	NO	NO	NO
TRANSPARENT TRANSACTIONS?	NO	NO	NO
ACCOUNTING FOR WHAT MATTERS?	NO	NO	NO
EARLY WARNINGS HEEDED?	NO	NO	NO
ROBUST AND SUSTAINABLE SYSTEMS?	**NO**	**NO**	**NO**

A society of consumers

Europeans have a high level of consumption

One week's food of a family in the United Kingdom

Source: „*Hungry Planet: What The World Eats*“, by Peter Menzel and Faith D'Aluisio

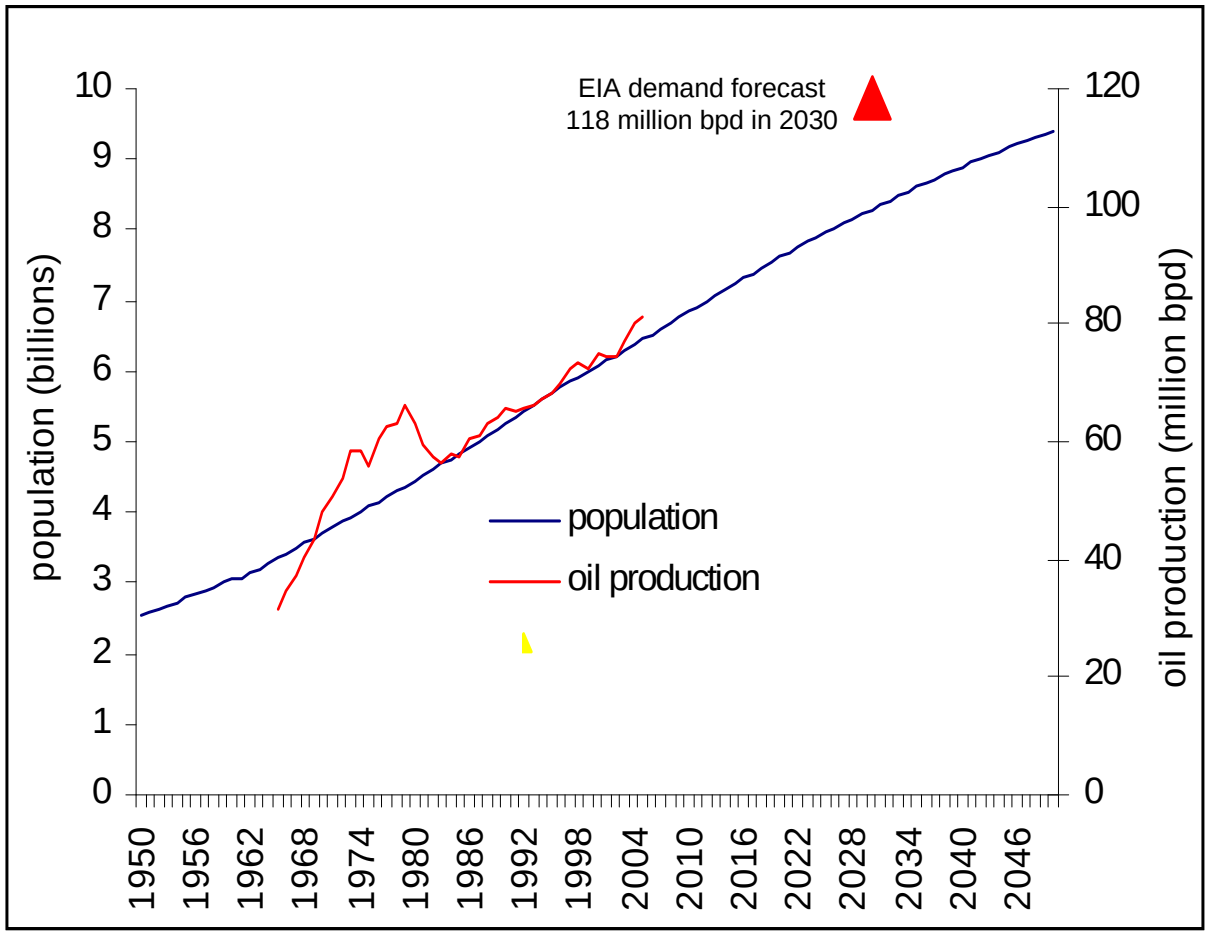
…compared to many people in developing countries

One week‘s food of a family in Ecuador

Source: „*Hungry Planet: What The World Eats*“, by Peter Menzel and Faith D'Aluisio

Source: „*Hungry Planet: What The World Eats*“, by Peter Menzel and Faith D'Aluisio

World population to grow by 1.8 billion by 2031

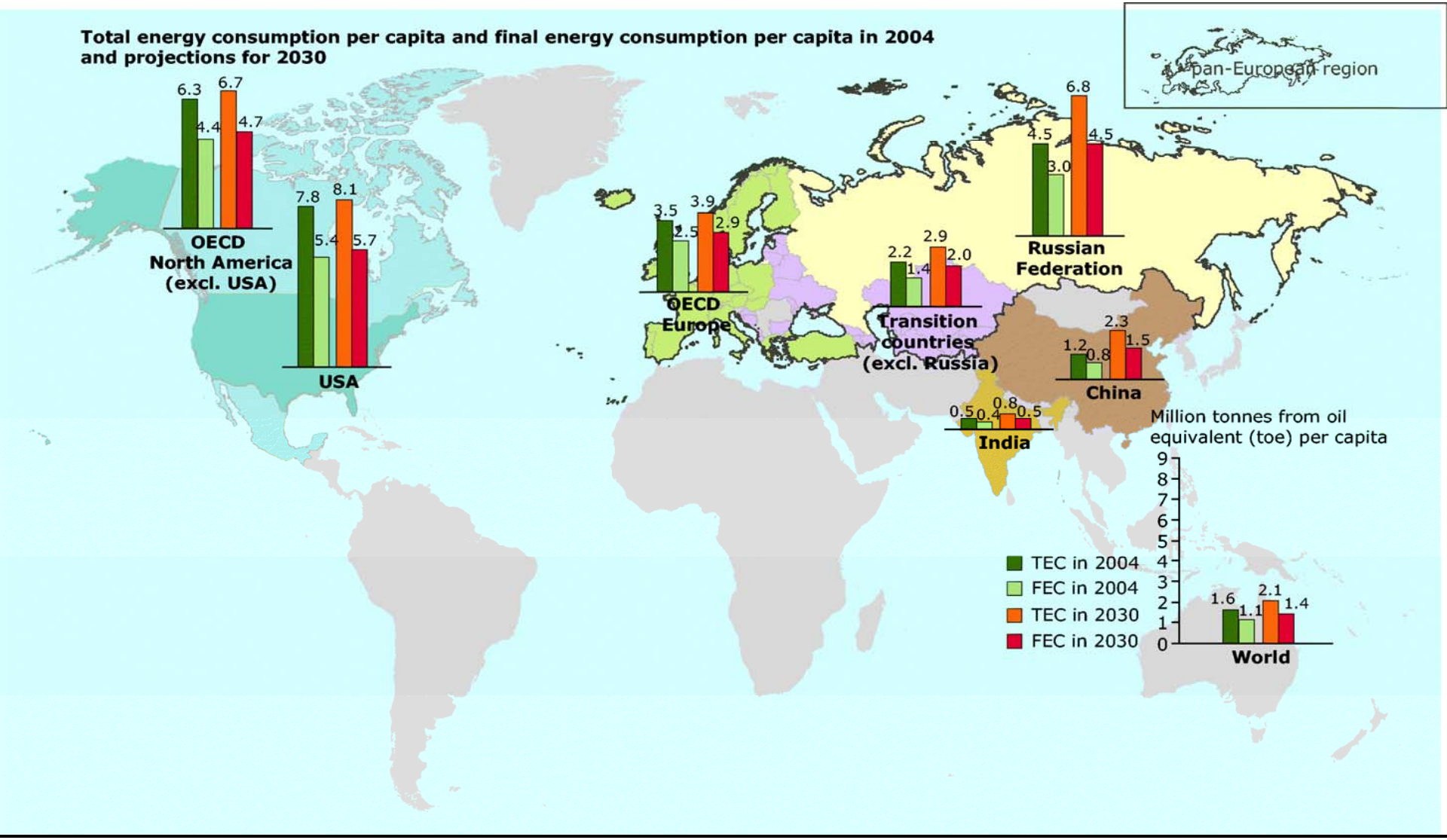


Consumption growth since '65:

- total energy 284%
- oil 268%
- gas 435%

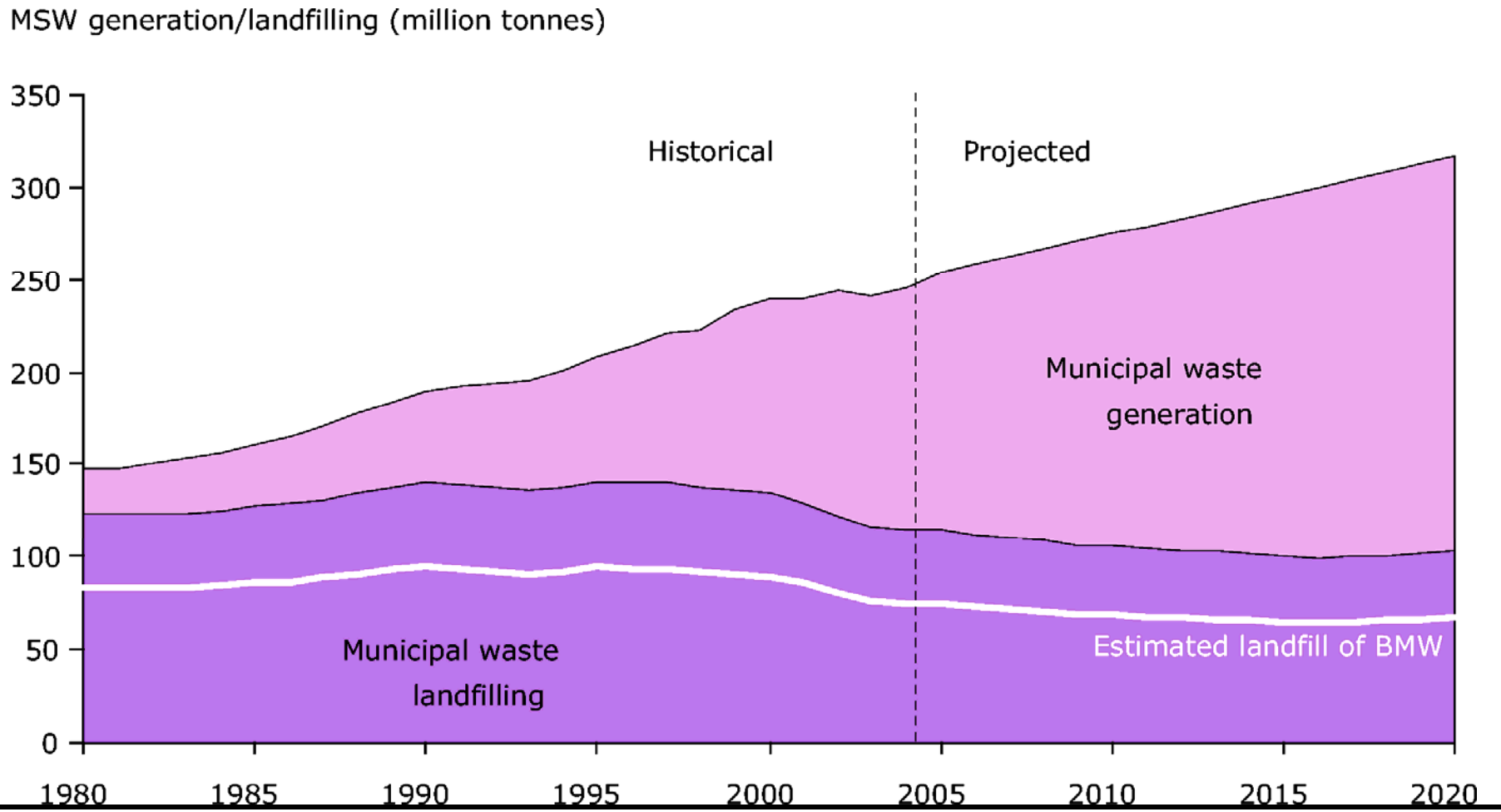
Energy demand growth:
developed world +111%
emerging economies +645%

Outlook: Total Energy Consumption per capita 2004 - 2030



Source: EEA, Belgrade report

Municipal waste generation in Europe is projected to grow



Source: EEA 3/2007brochure

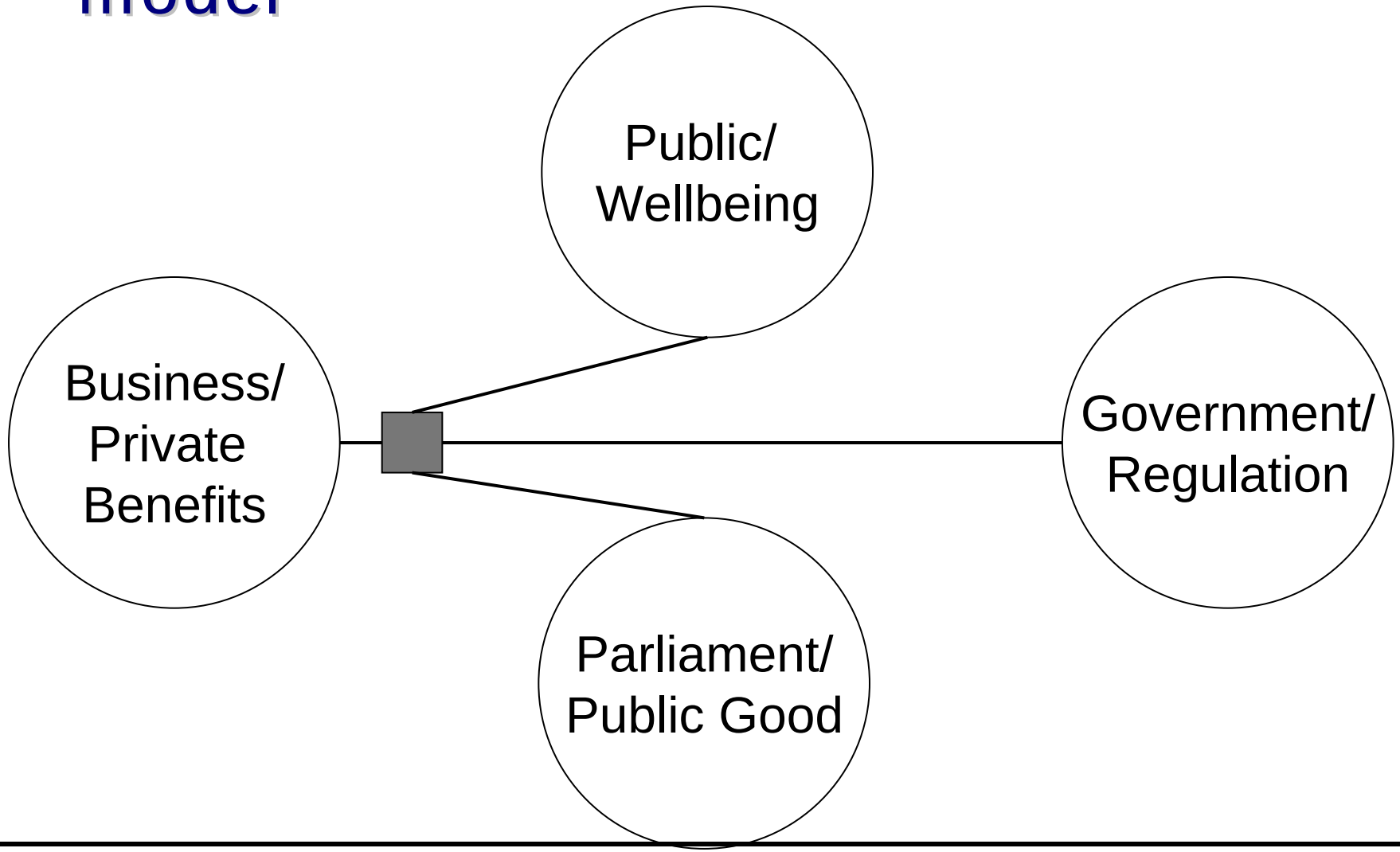
Some features of good governance

- Maintaining capitals
- Meeting needs of today's ageing populations and next generations
- Balancing resource consumption
- Public participation

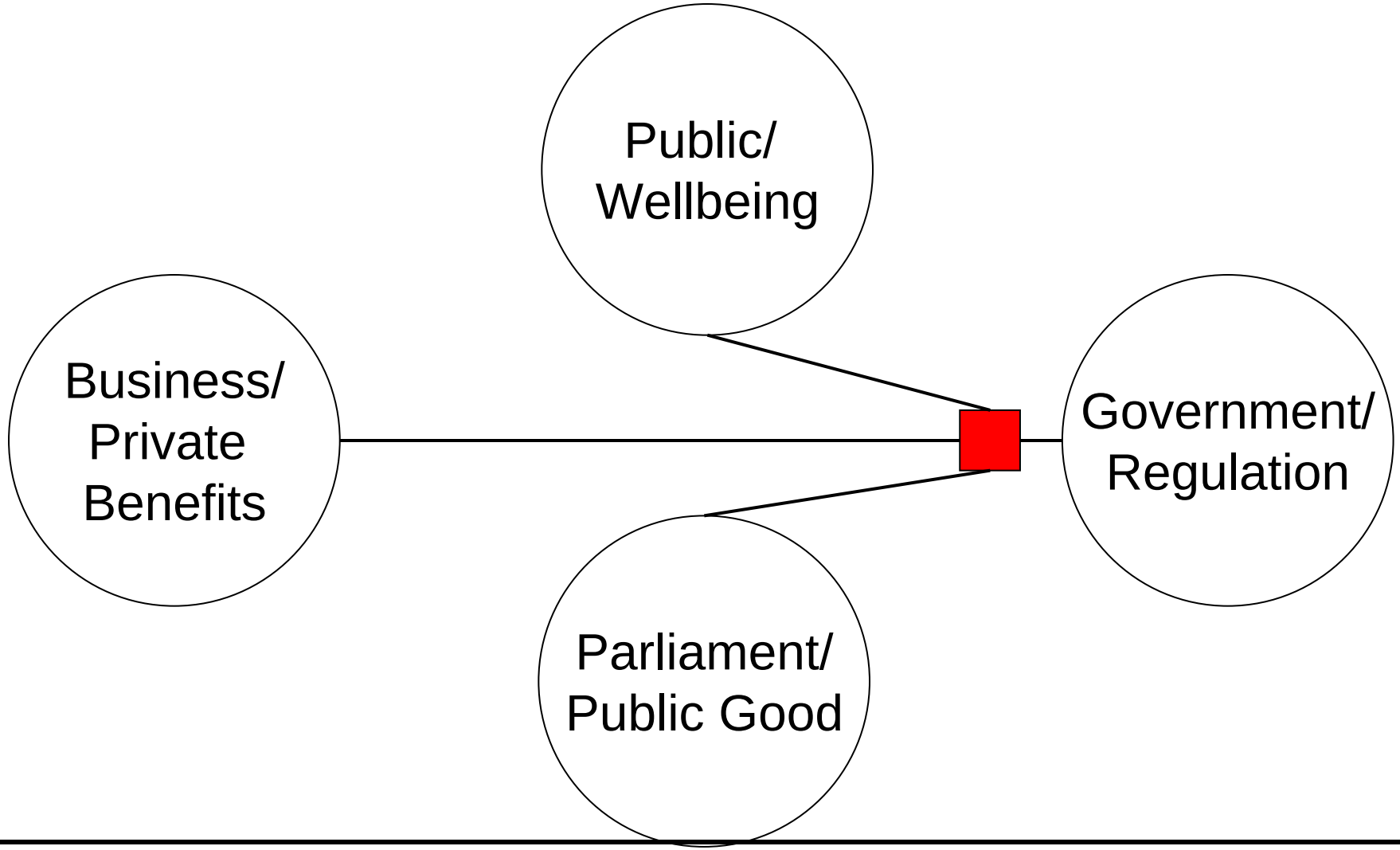
GOOD GOVERNANCE	FINANCIAL SYSTEMS	ENERGY SYSTEMS	ECOSYSTEMS
CONSUMING FLOWS WHILST MAINTAINING QUALITY AND QUANTITY OF ASSETS	CONSERVATIVE ASSET/ DEBT RATIOS	FROM *STOCKS* OF FOSSIL FUELS TO *FLOWS* OF RENEWABLES	MAINTAINING NATURAL CAPITAL *STOCKS* WHILE SECURING *FLOWS* OF ECOSYTEM SERVICES
ALL RISKS AND DEBTS INTERNALISED INTO MARKET PRICES	REALISTIC ASSET/ DEBT PRICING	EXTERNALITIES INTERNALISED INTO PRICES	EXTERNALITIES INTERNALISED INTO PRICES
ECONOMIC TAX & SUBSIDY REFORM TO FINANCE "GREEN NEW DEAL", AGEING POPULATION COSTS ETC	***"TOBIN TAX" ON CURRENCY/COMMODITIES SPECULATION?***	***FROM TAXING PEOPLE TO TAXING ENERGY AND RESOURCES***	***FROM TAXING PEOPLE TO TAXING ENERGY AND RESOURCES***
TRANSPARENT TRANSACTIONS	UNDERSTANDABLE FINANCIAL PRODUCTS	MARKET PRICES REVEALING "ECOLOGICAL TRUTH"	MARKET PRICES REVEALING "ECOLOGICAL TRUTH"

GOOD GOVERNANCE	FINANCIAL SYSTEMS	ENERGY SYSTEMS	ECOSYSTEMS
ACOUNTING FOR WHAT MATTERS	REAL DEBT / ASSET RATIOS	ALL COSTS/ SUBSIDIES	ECOSYSTEM SERVICES AND ASSETS
	"B E Y O N D G D P"		
EARLY WARNINGS FROM LATE LESSONS	"INCONVENIENT TRUTHS" ACTED ON		
COMMUNITY LEVEL INITIATIVES	MICRO-FINANCE	DISTRIBUTED NETWORKS	CO-MANAGEMENT OF ECO-SYSTEMS
DIVERSE DISTRIBUTED,PARTICIPATORY, RESILIENT AND SECURE SYSTEMS?	YES	YES	YES

Current deregulated governance model

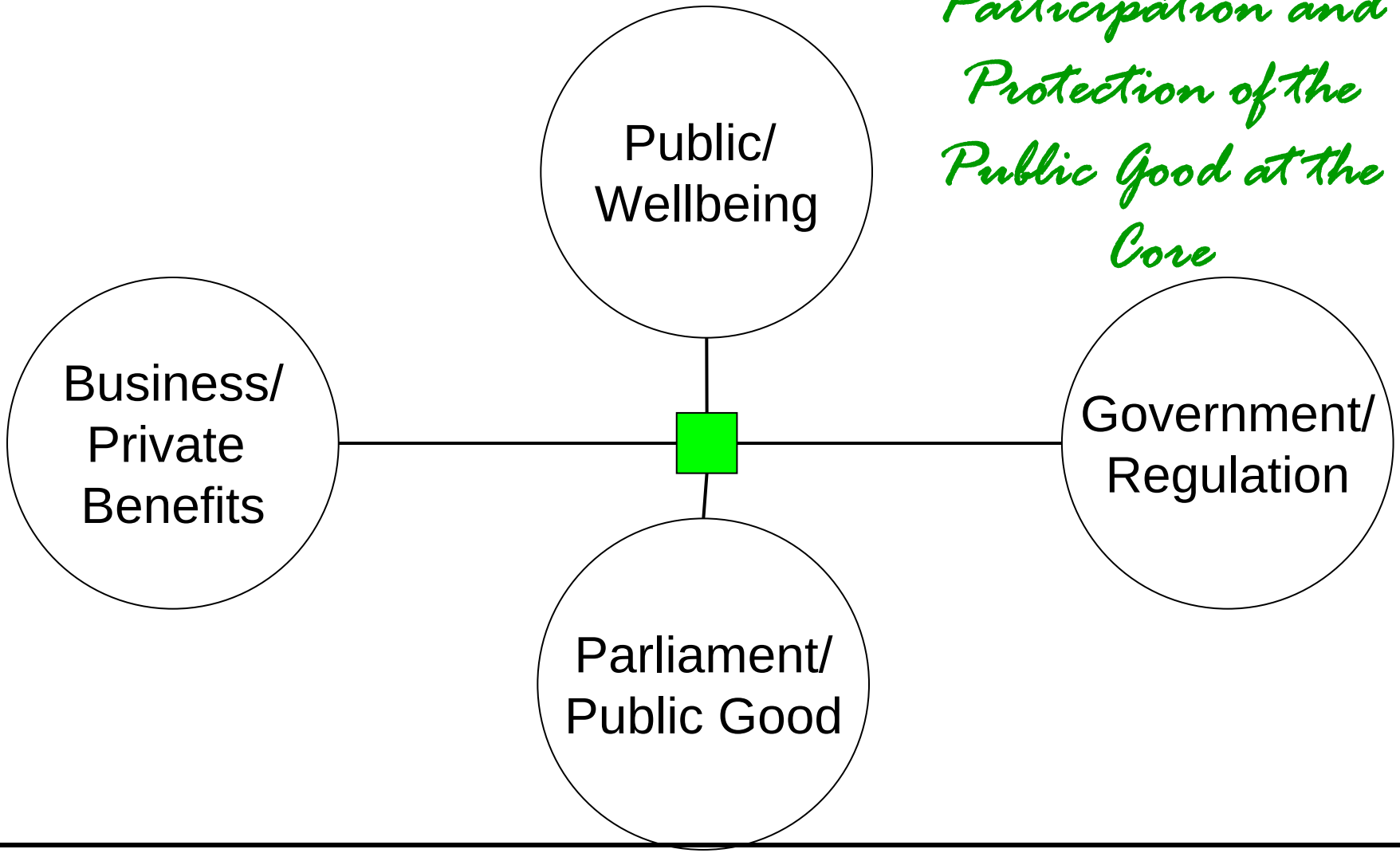


State control governance model ??



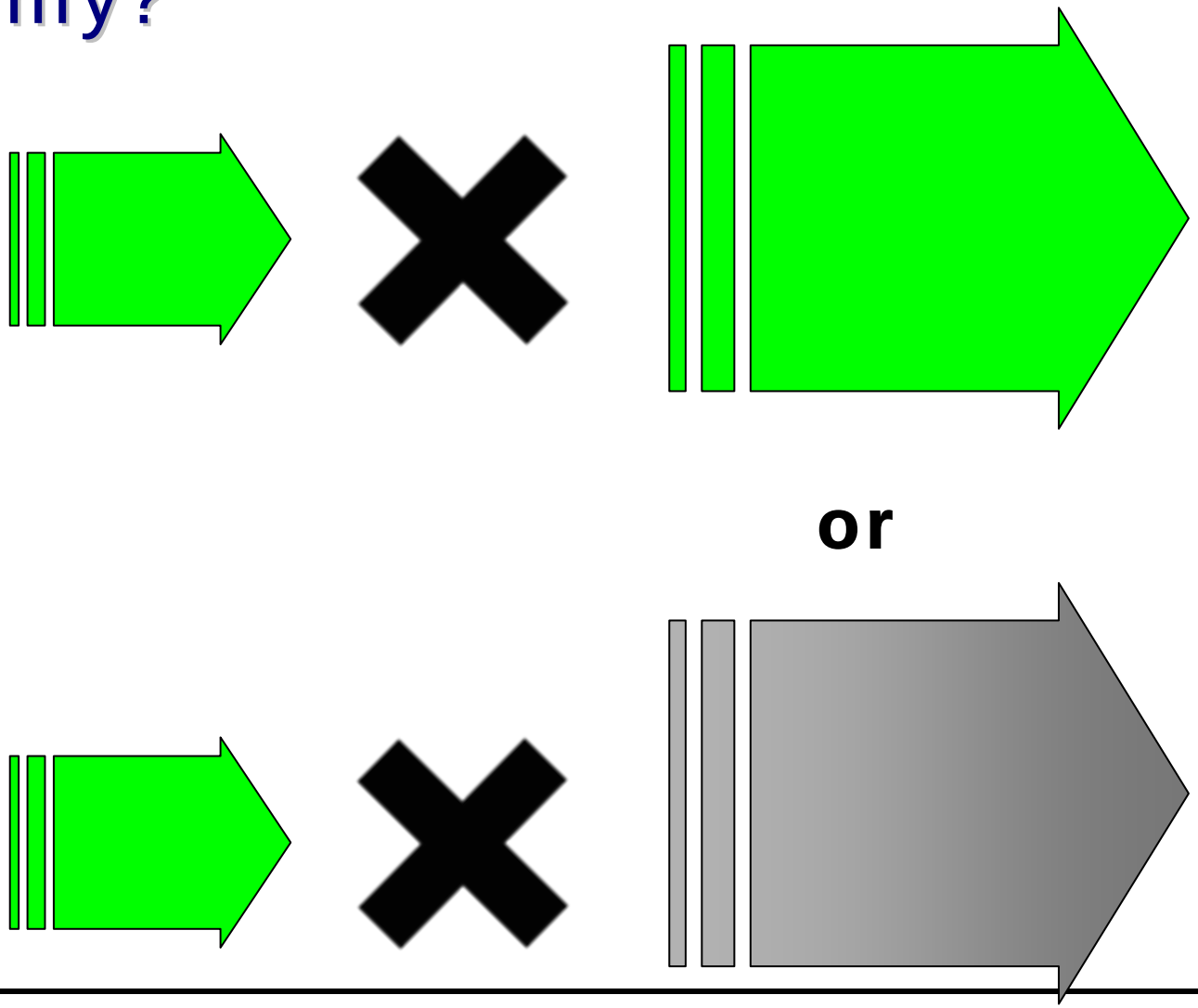
Green Economy

Public Participation and Protection of the Public Good at the Core




policy decisions need to be made on a clear understanding of the true cost of using our natural resources and ecosystems

A Green Multiplier for a Green Economy?



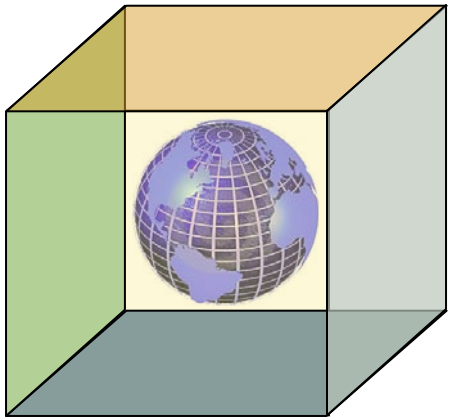
Ensuring we avoid negative feedbacks in the process of enormous inputs of fiscal packages

- **Green Governance requires participation of all**
  - **International institutions**: common objectives, equity
  - **National governments**: regulation, justice, security
  - **Parliaments, democratic bodies**: protection of the public good
  - **Local governments, communities:** participatory stewardship
  - **Households:** consumption patterns, from goods to services
  - **Business:** full costs, ecoprofits

- **Macroeconomic steering of GGND requires "Beyond GDP" accounting**
  - **Concealed capital consumption**
    - Consumption of ecosystem capital
    - User cost of non renewable assets
  - **Full cost of goods and services**
    - Full cost of domestic commodities
    - Full cost of imported commodities
  - **Net Disposable National Income**
    - As SNA headline aggregate

Feasible approach to harnessing the crises

Georges Braque – Harbour in Normandy, 1909



Ecosystem Footprint *(land, soil, water, carbon)*

Biodiversity Rarefaction *(loss of adaptability)*

HANPP *(biomass diverted from Nature)*

Landscape Ecological Potential *(the landscape radiography)*

Consumption of Ecosystem Capital *(restoration costs of potentials)*

€

Catchments Exergy Loss *(from water evaporation & pollution)*

Adjustment of Net Disposable National Income

Awareness and inclusiveness = green consumers

"It wasn't until I had the chance to take part in the HSBC Climate Partnership programme that I realised just how much damage we are doing to the planet. The experience has helped me to better understand the huge challenge presented by climate change."

"It's great to meet colleagues from HSBC who share the same enthusiasm about environmental issues and realise the urgency of acting, not just thinking and worrying."

“A terrific experience without a doubt!! Our contribution to the scientific research can and does make a difference; that’s an indescribable thrill. I have learned a lot and the comradeship is a lifetime treasure”.

“A great opportunity to meet like-minded people and be guided by professionals in the environmental arena. It is the starting block for many to begin their journey of change”.

quotes from Earthwatch/HSBC Climate Partnership programme

SEIS Principles

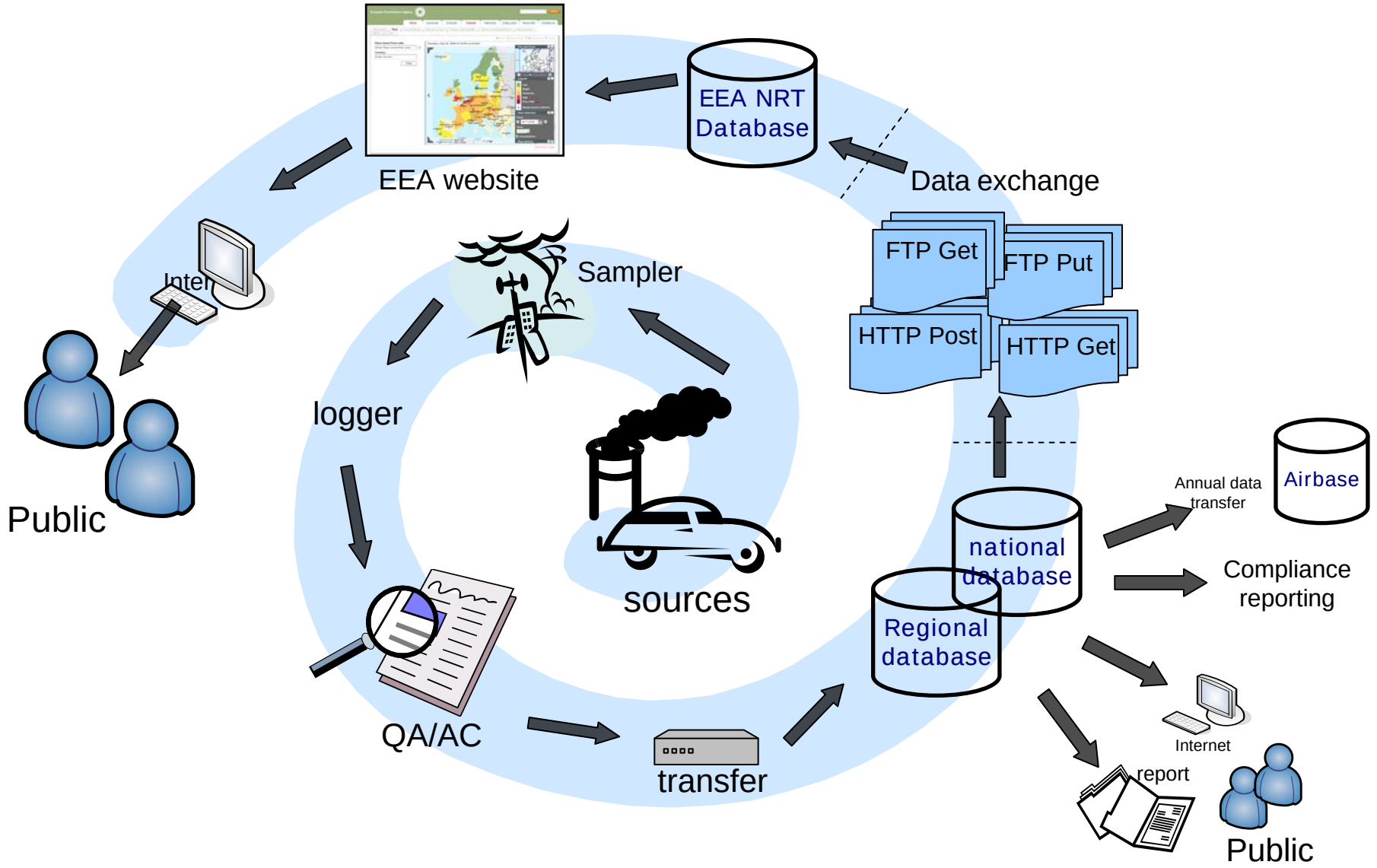
information should be managed as **close as possible to it source**

information is provided **once and shared with others for many** purposes

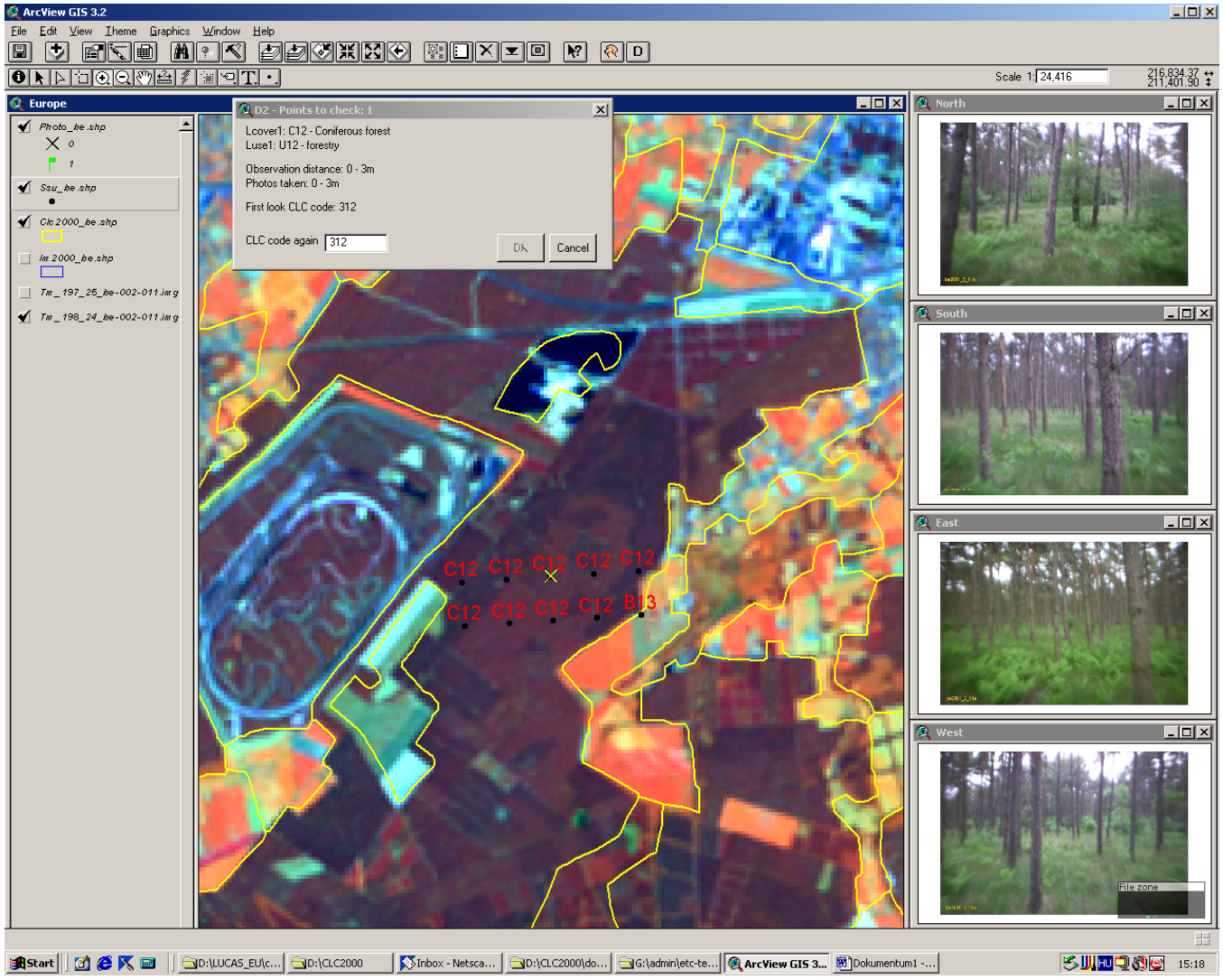
data and information should be **readily accessible** to end-users to enable them to access it timely

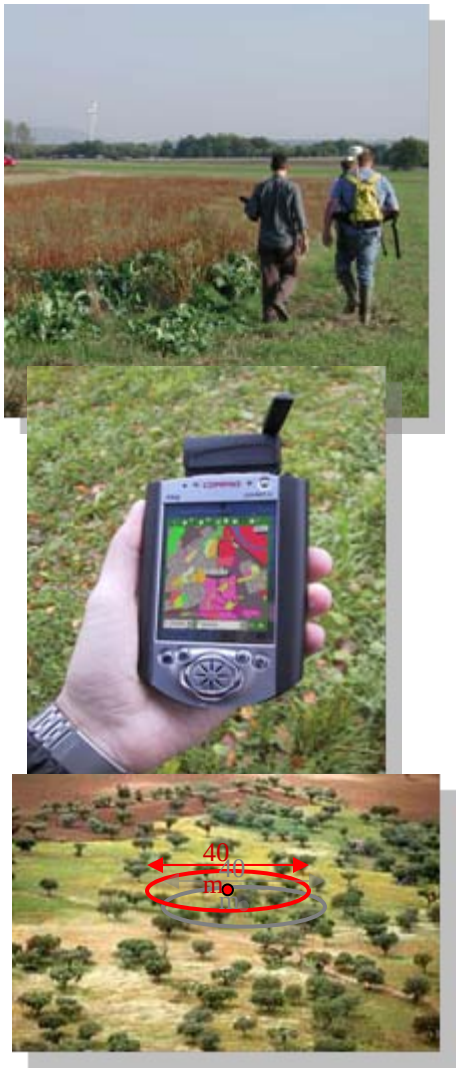
information should be made available to the public after due consideration of the **appropriate level of aggregation**, given possible confidentiality constraints, and at national level in the **national language(s)**

Where are all the data coming from?



Integrating space and *in-situ* monitoring





Place name/Post code:

Aalborg

Country:

Denmark

Find

Search results 1-1 of 1:

1 Aalborg, Aalborg, DK
Click here to zoom

◄ Previc Next ►

Preliminary data

Saturday, May 5, 2007 at 15:00 Local time

Ozone conditions near Aalborg/8158,AALBORG, DENMARK

Data provider:

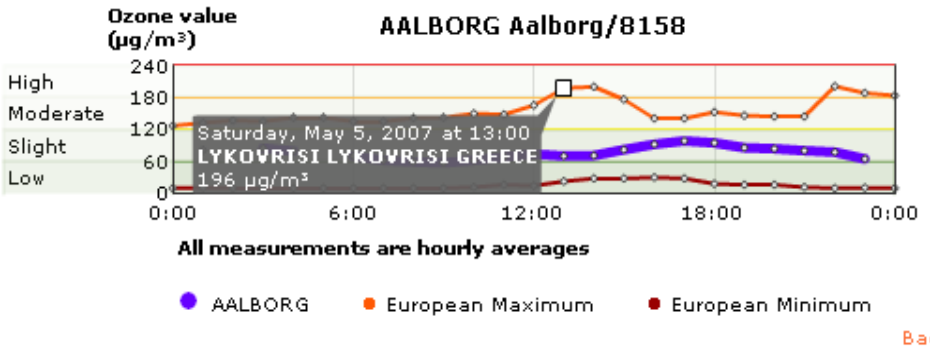
DMU

More information:

Go to the DMU home page for further details:

http://www.dmu.dk/International/Air/Air+pollution.htm

5-5-2007 1 day 1 week 1 month ?



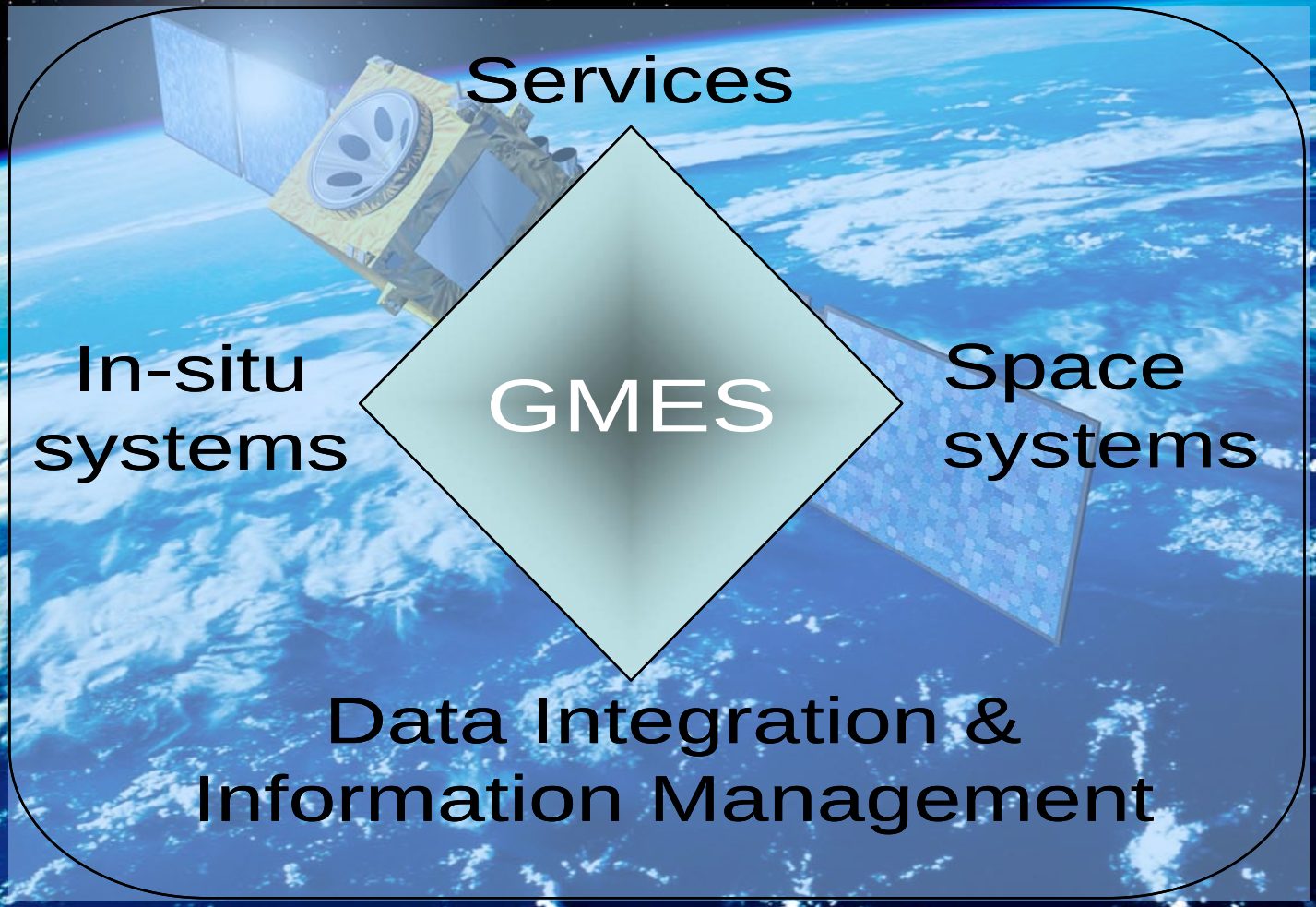
All measurements are hourly averages

AALBORG European Maximum European Minimum

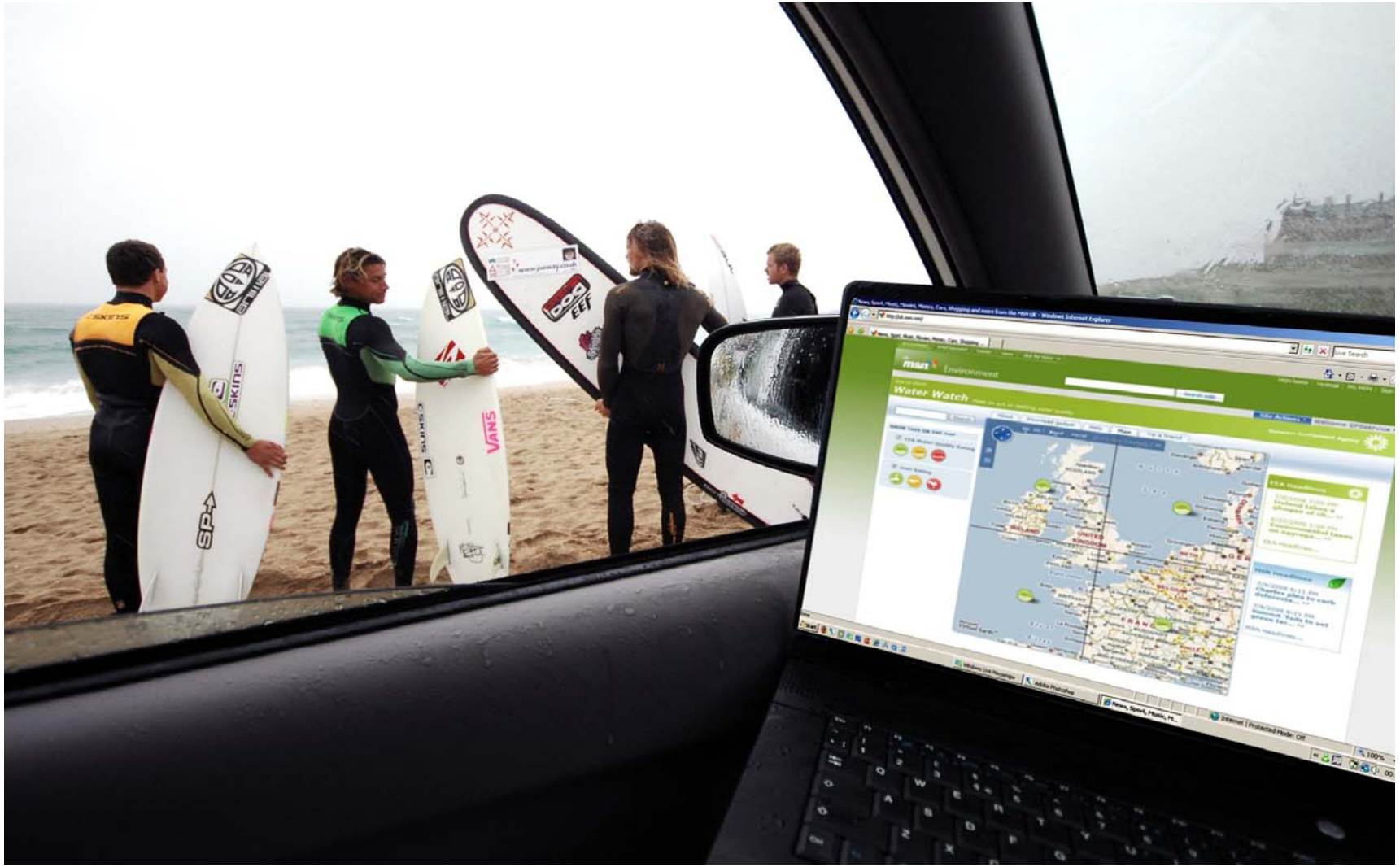
Back to map

Water Information System for Europe - www.water.europa.eu

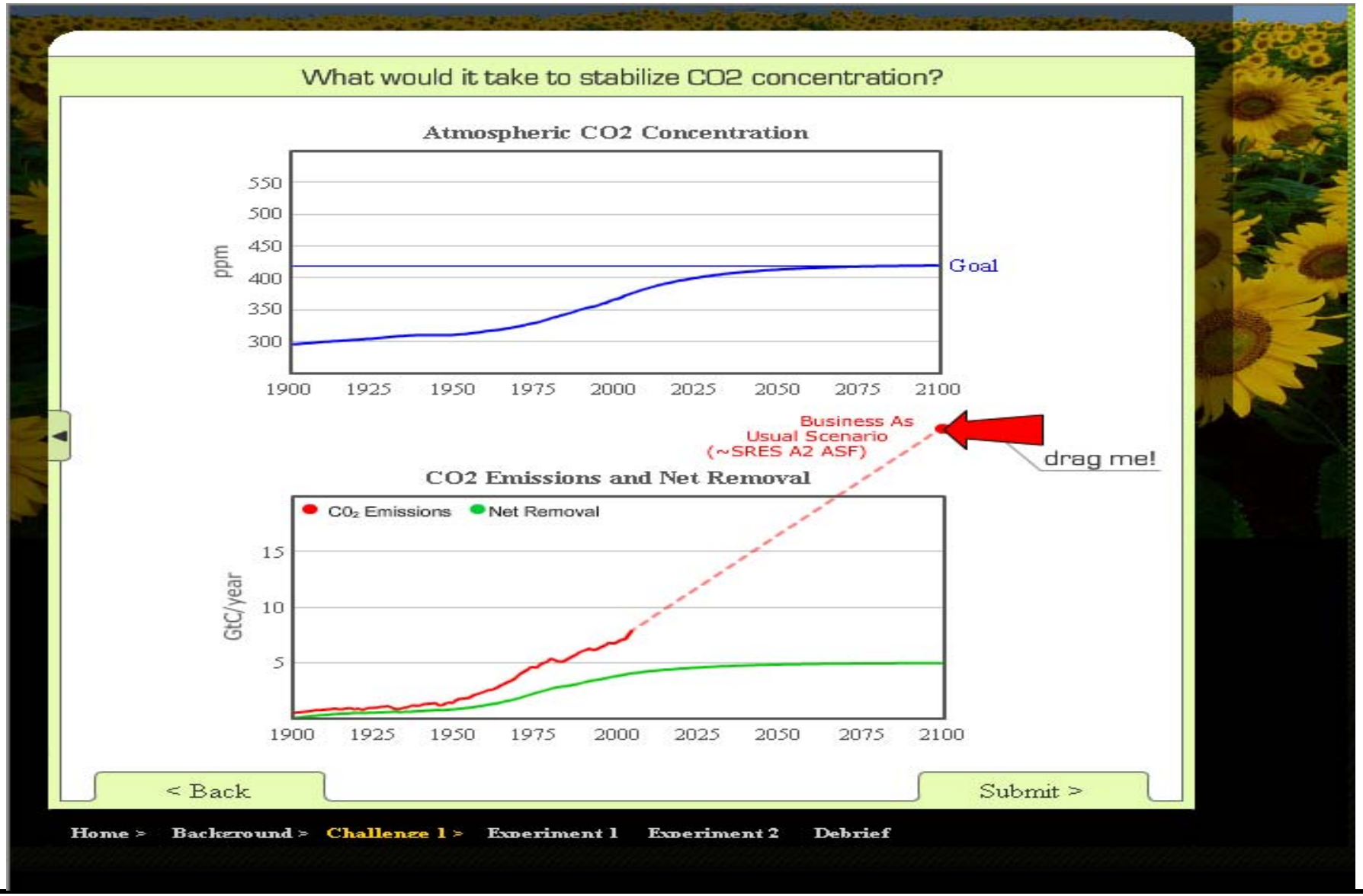
Global Monitoring for Environment and Security



Eye on Earth - the global citizen observatory
EEA Microsoft partnership Water watch



MIT – climate simulator



Public/citizen participation – wherever you are!

Thank you for your attention!

Professor Jacqueline McGlade
Executive Director
European Environment Agency