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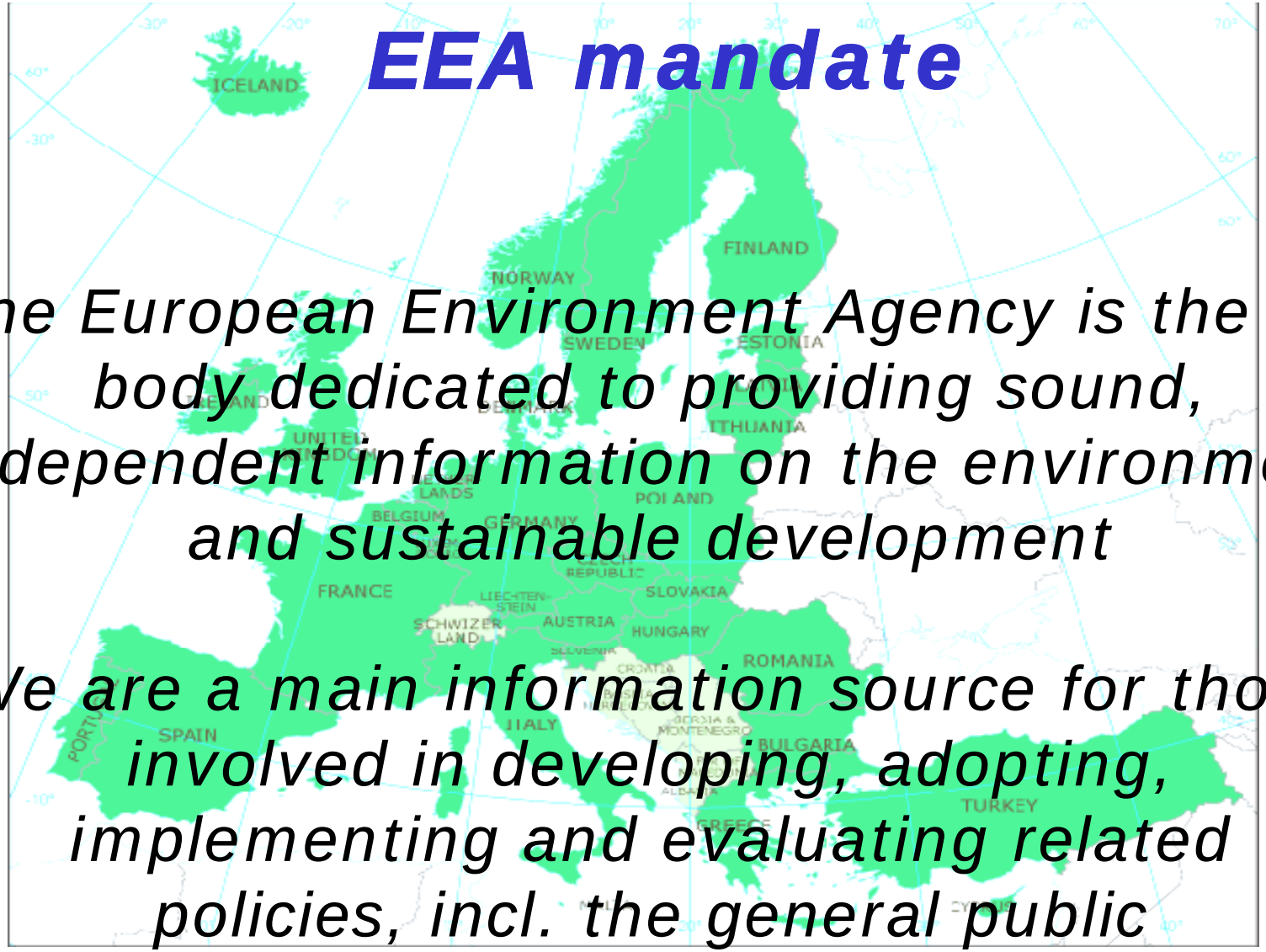
EEA mandate



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

We are a main information source for those involved in developing, adopting, implementing and evaluating related policies, incl. the general public

Member countries

Collaborating countries

EEA activities on CC in a nutshell

Clusters of activities

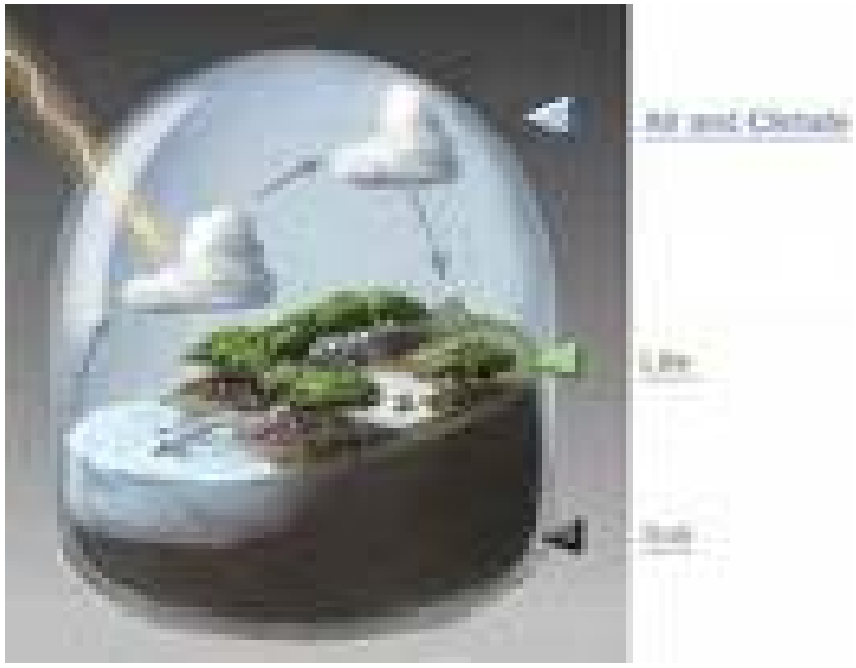
- Climate change impact indicators
- Climate change vulnerability and adaptation
- Regulatory GHG reporting mechanism
- Costs of inaction to climate change
- Climate change outlooks and scenarios

Key projects

- Impacts of Europe's changing climate – 2008 indicator-based assessment (EEA-JRC-WHO report)
- Vulnerability and adaptation to water scarcity
- Developing adaptation indicators (Scoping phase)
- Support to the development of a European Clearinghouse on climate change
- Impacts assessment of policies
- Spatial analysis & assessments of land dynamics

Climate change…Mitigation…Impacts, vulnerabilities…Adaptation, land use, territorial cohesion…Landscape management

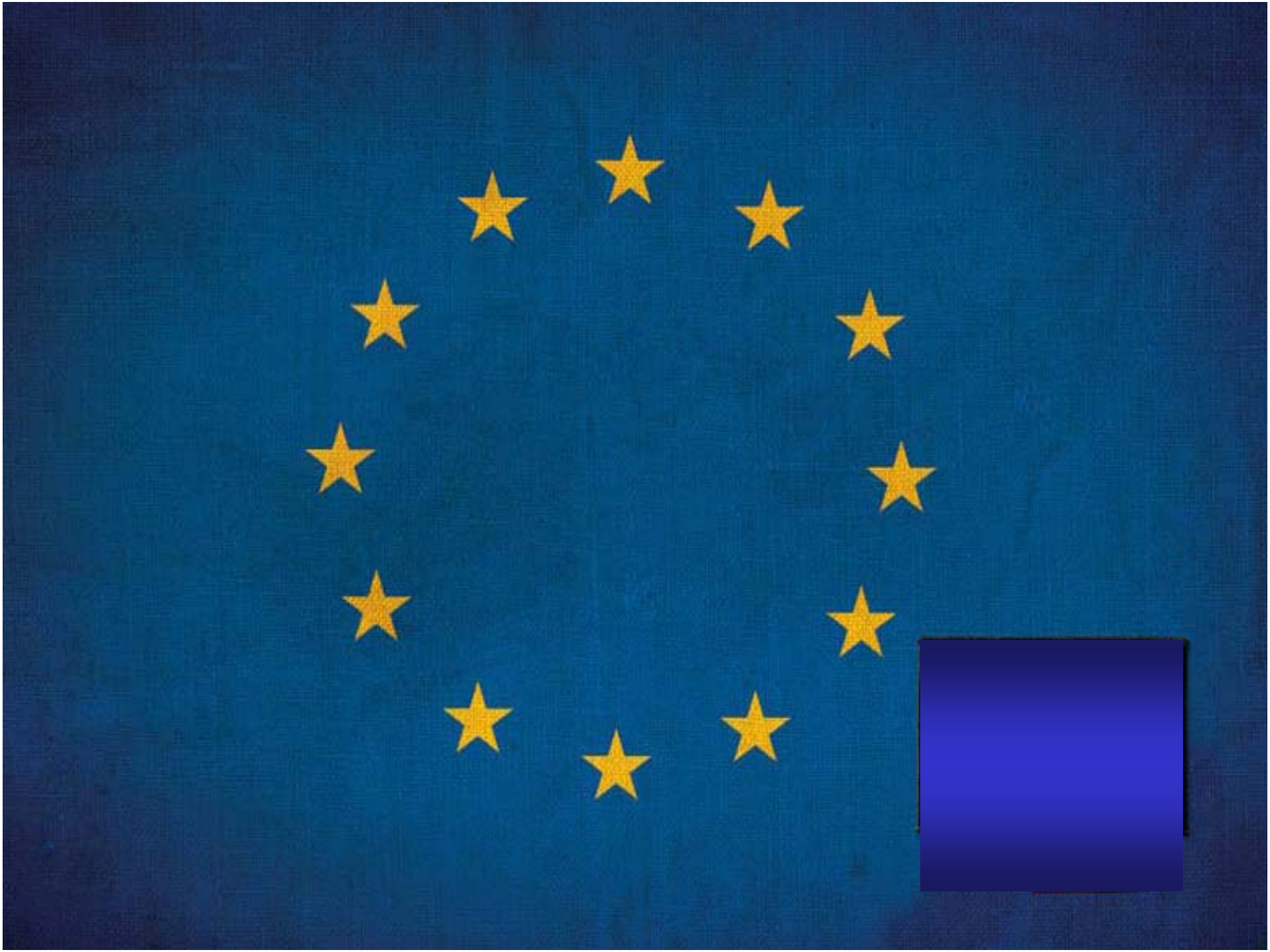
No challenges stand in isolation



Planning for Climate change
A Trans-Atlantic Workshop
Dubrovnik, 7-9 May 2009

Ronan Uhel

European Environment Agency



Mitigation targets & policies

- Championing Kyoto Protocol: on track towards EU 8 % reduction by 2012 compared to 1990 levels
- EU Trading market in place - ~25 USD /ton today
- New 2008 Climate-Energy package – the Triple 20:
  - 20 % GHG reduction
  - 20 % energy efficiency
  - 20 % renewable share
- 2009 Recast of Directive on Energy performance of buildings: by 2019 new buildings to be energy-efficient

EU cities: 80 % of total EU CO_2

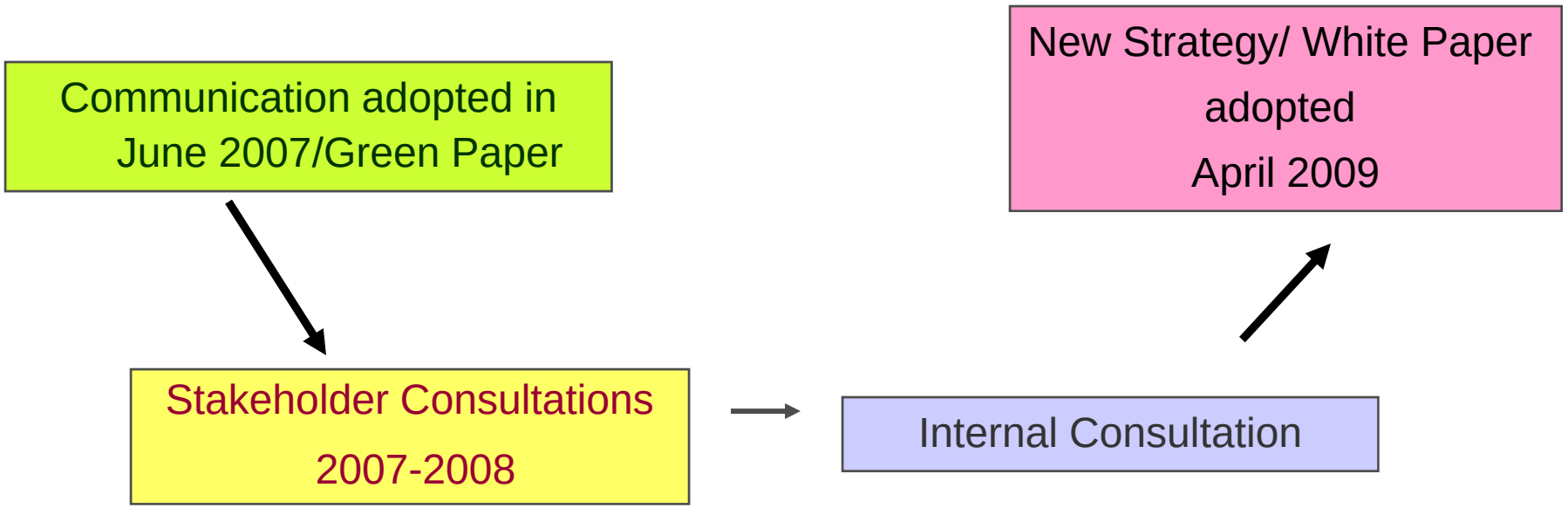
…excerpts from Commission's press release on the **recast of the Energy Performance of Buildings Directive (2002/91/EC)**

- The energy consumption of buildings varies enormously:
  - new buildings can need less than 3 to 5 l of heating oil or equivalent per m^2 of floor area and year
  - the existing buildings stock consumes, on average, about 25 l per m^2, some buildings even up to 60 l

- Recast directive foresees:
  - 5-6% less energy will be used in EU in 2020 (eq. total current consumption of Belgium and Romania
  - about 5% less CO_2 emissions will be emitted in the whole EU in 2020

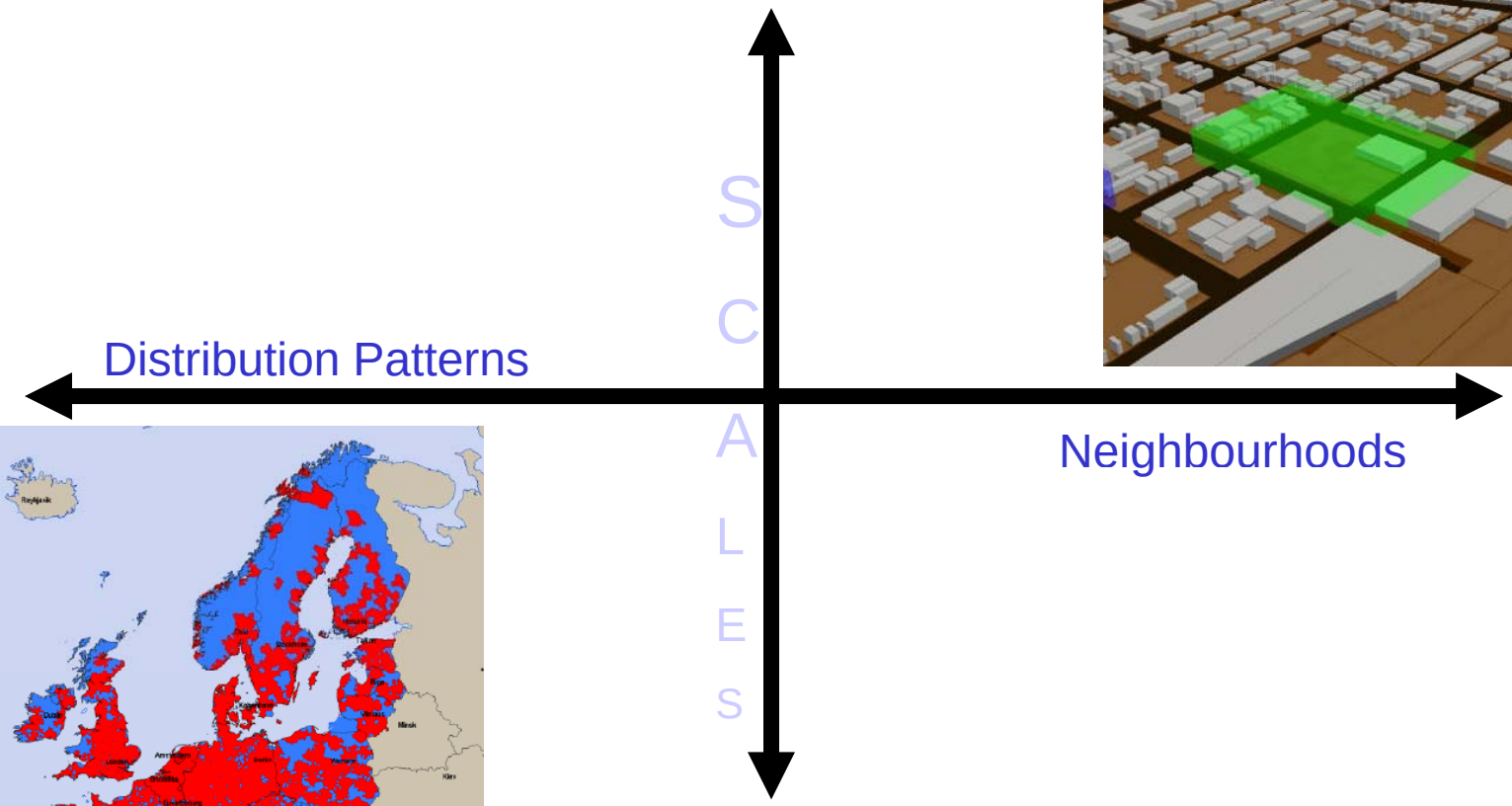
→ How / Who to monitor progress?

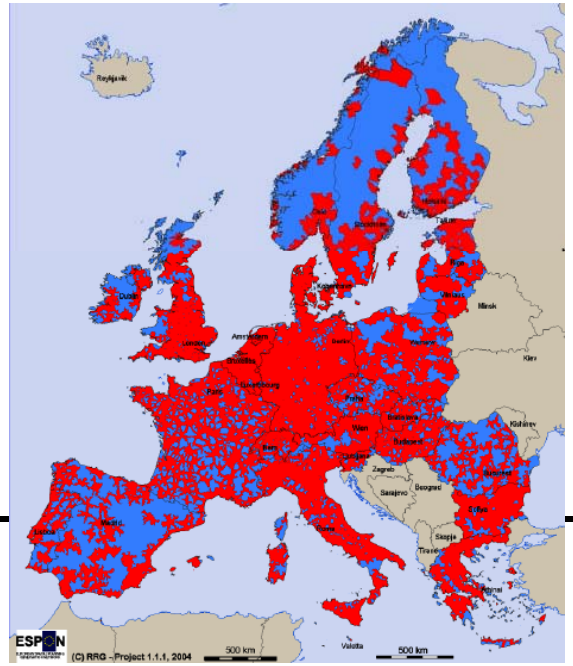
ADAPTATION: POLICY MAKING PROCESS AT EU LEVEL



Development of an EU Adaptation Framework

Forming the understanding and information base






Didn't you hear ? There's a flash flood warning in effect!
BUS
© Original Artist
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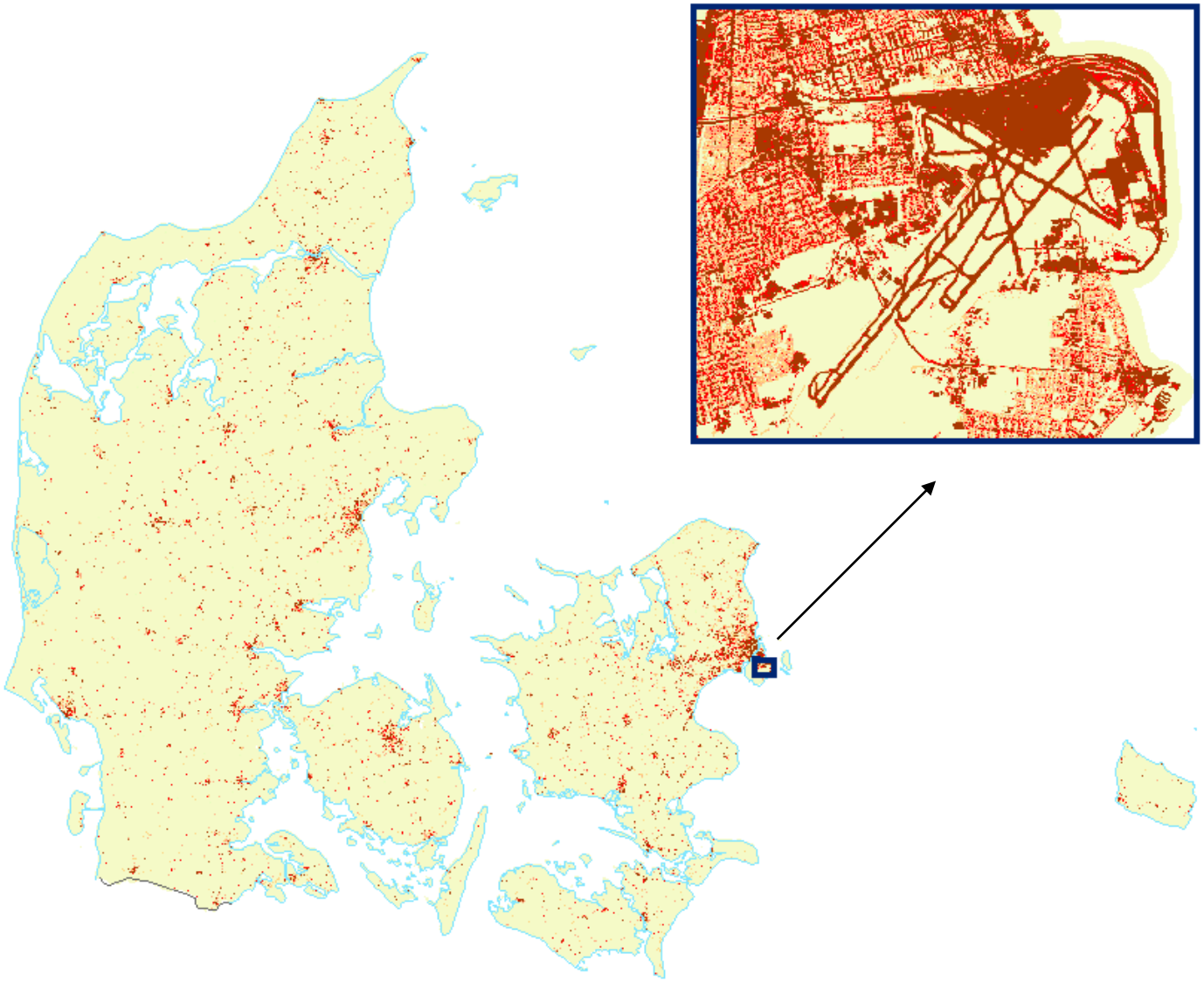
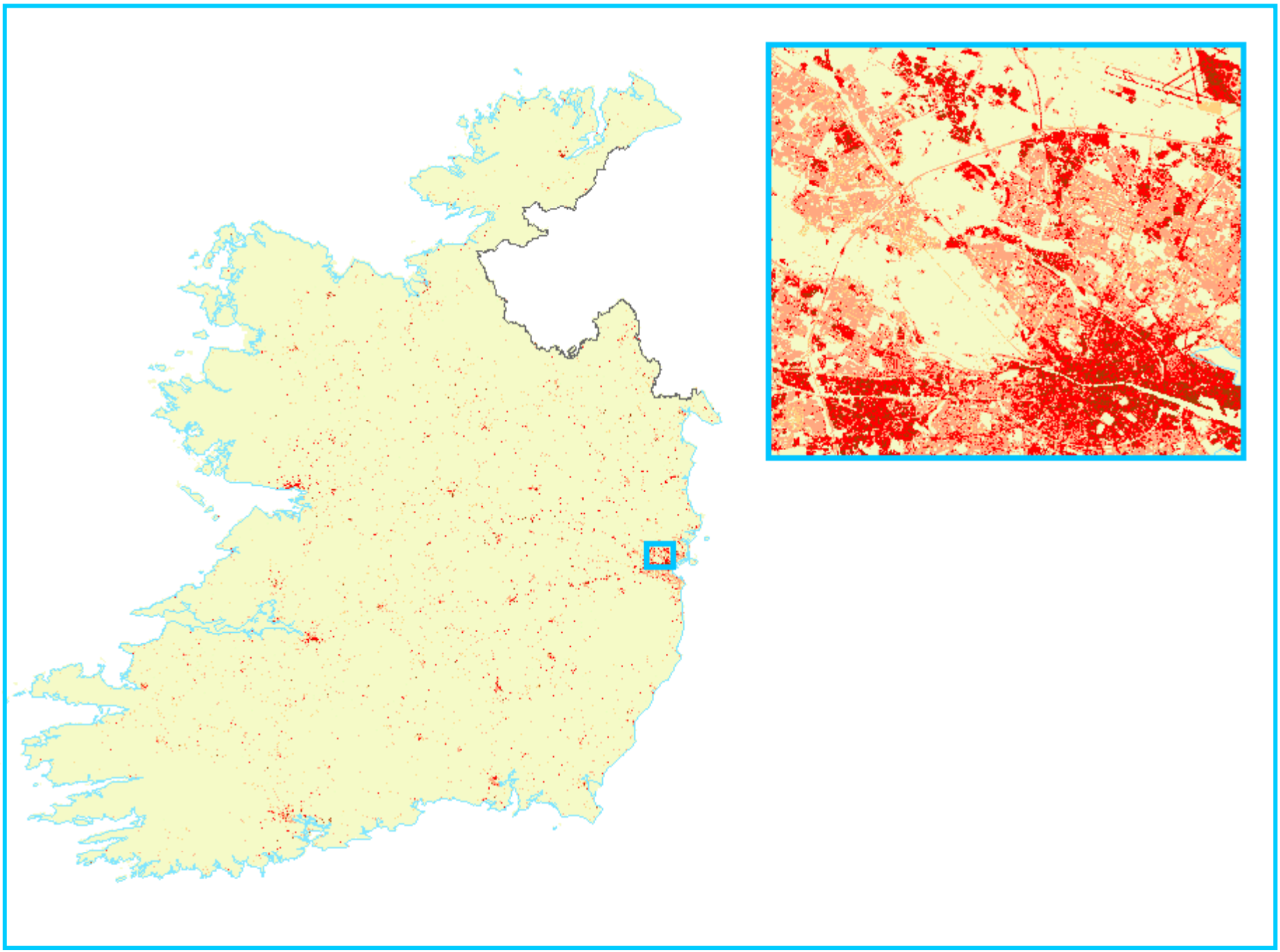
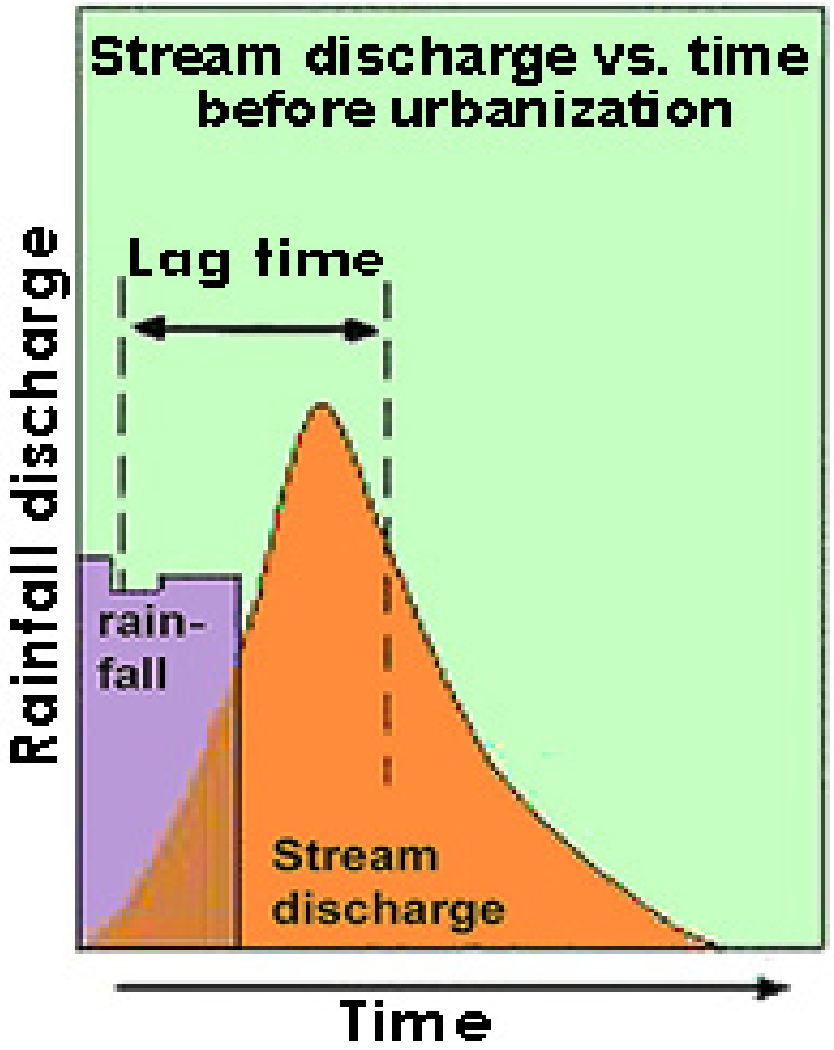
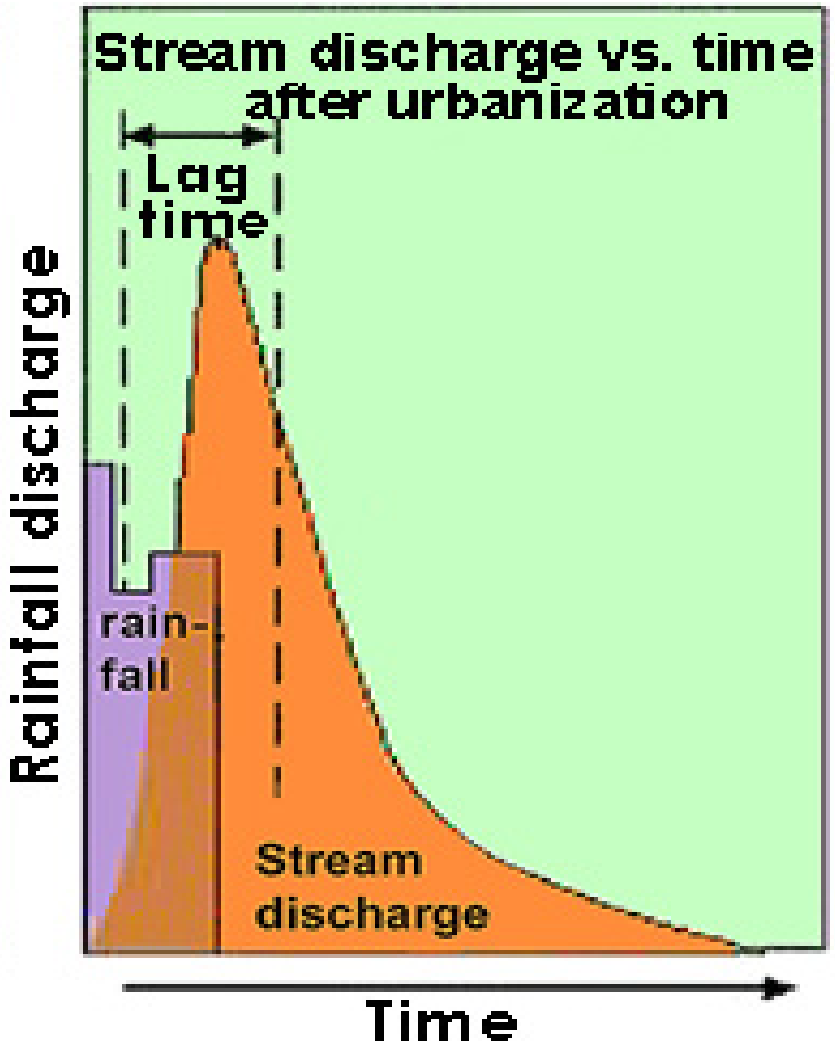
Intensive uptake and sealing of soil surface





...causing more damaging flash floods





…mostly related to urban space

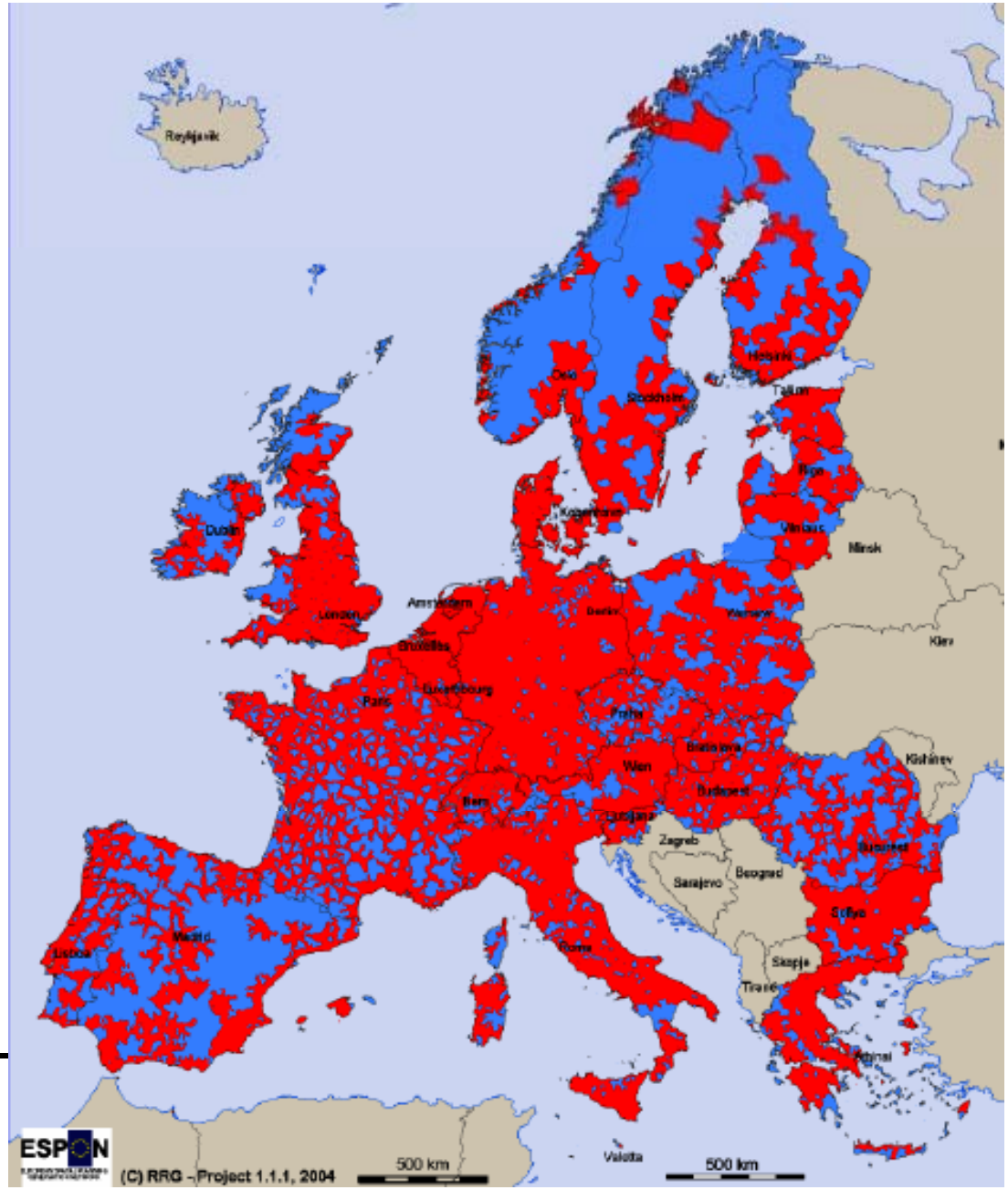
- **Since mid-50s, European cities expanded by 78 %, whereas population grew by 33 %**
- **Over the past 20 years, the extent of built-up areas in many countries has increased by 20 %, while the population has increased by only 6 %**
- **Eq. 5 times area of Great London to urban sprawl in Europe in 1990s**
- **The amount of space consumed per person in cities has more than doubled over the past 50 years**
- **In Germany 52 % of the soil in built-up areas is sealed (or the equivalent of 15 m^2 per second over a decade)**
- **Regions such as Mediterranean coastal areas have experienced 10 % increase in soil sealing during the 1990s.**

And ever-growing urban mobility

During past 20 years, 4 times more new cars that new babies in our cities

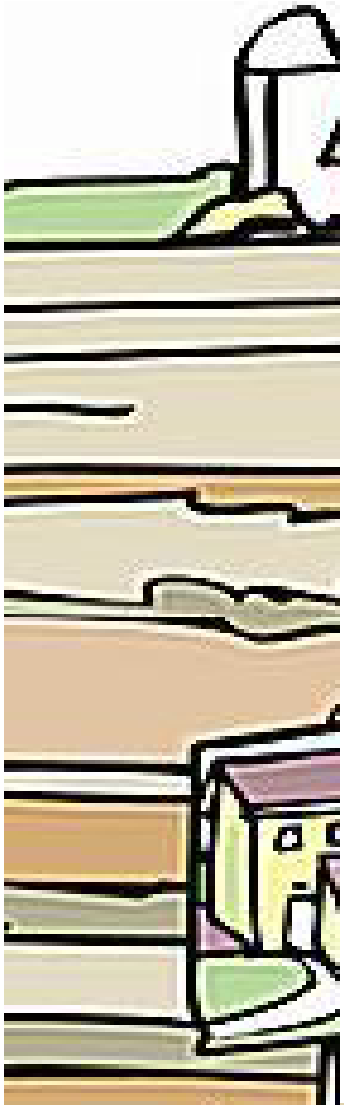
The number of kilometres travelled in urban areas by road transport is predicted to rise up to 40 % by 2030 compared to 1995

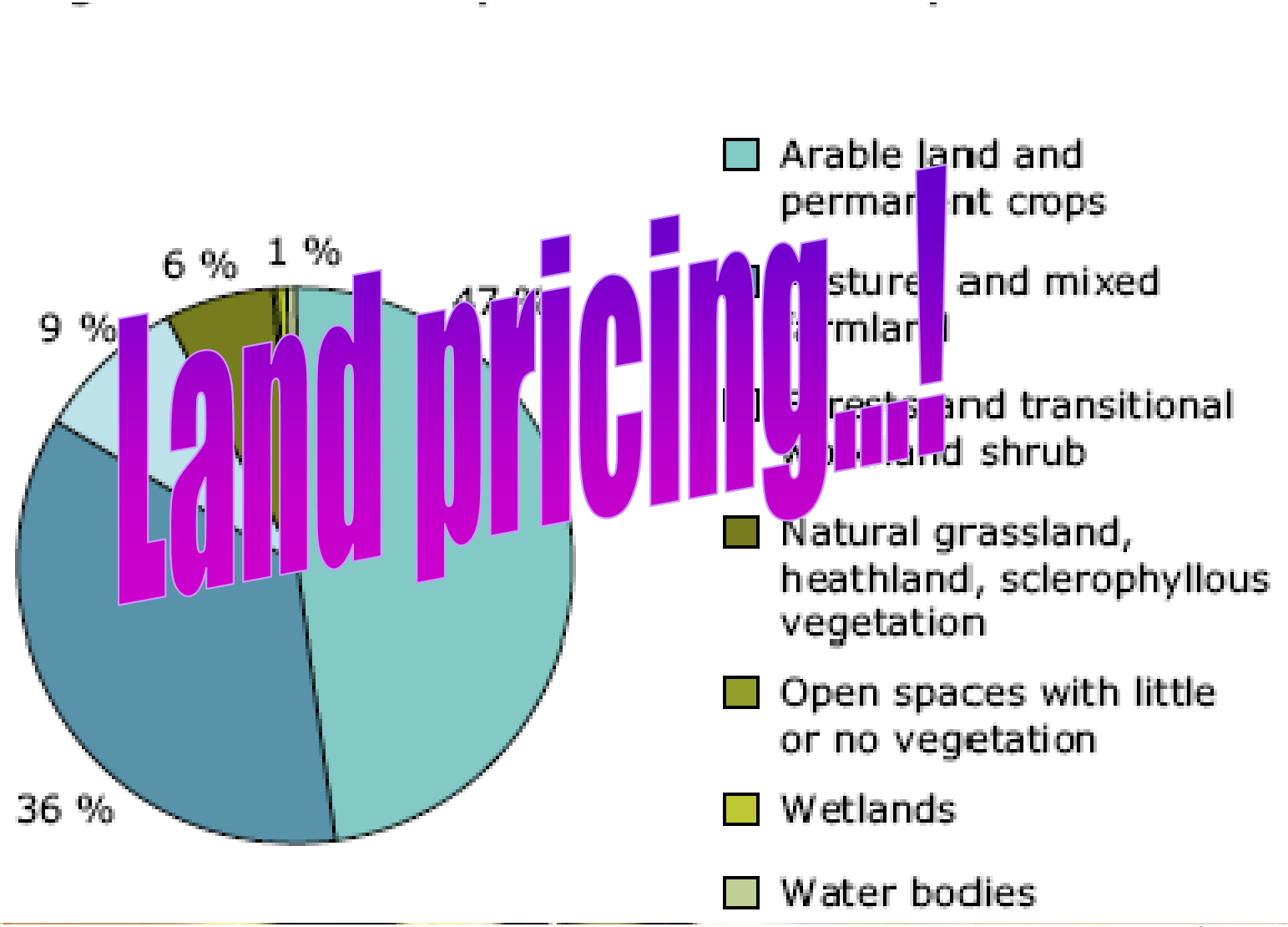
10,000 km of highways built 1990-2005 in EU; 12,000 financed (20bn € per year) over 2007-13 to connect urban nodes in new MS



45 min driving reach to urban centres -1990s

…with uptake over resource-rich land and soil…





Land pricing…!

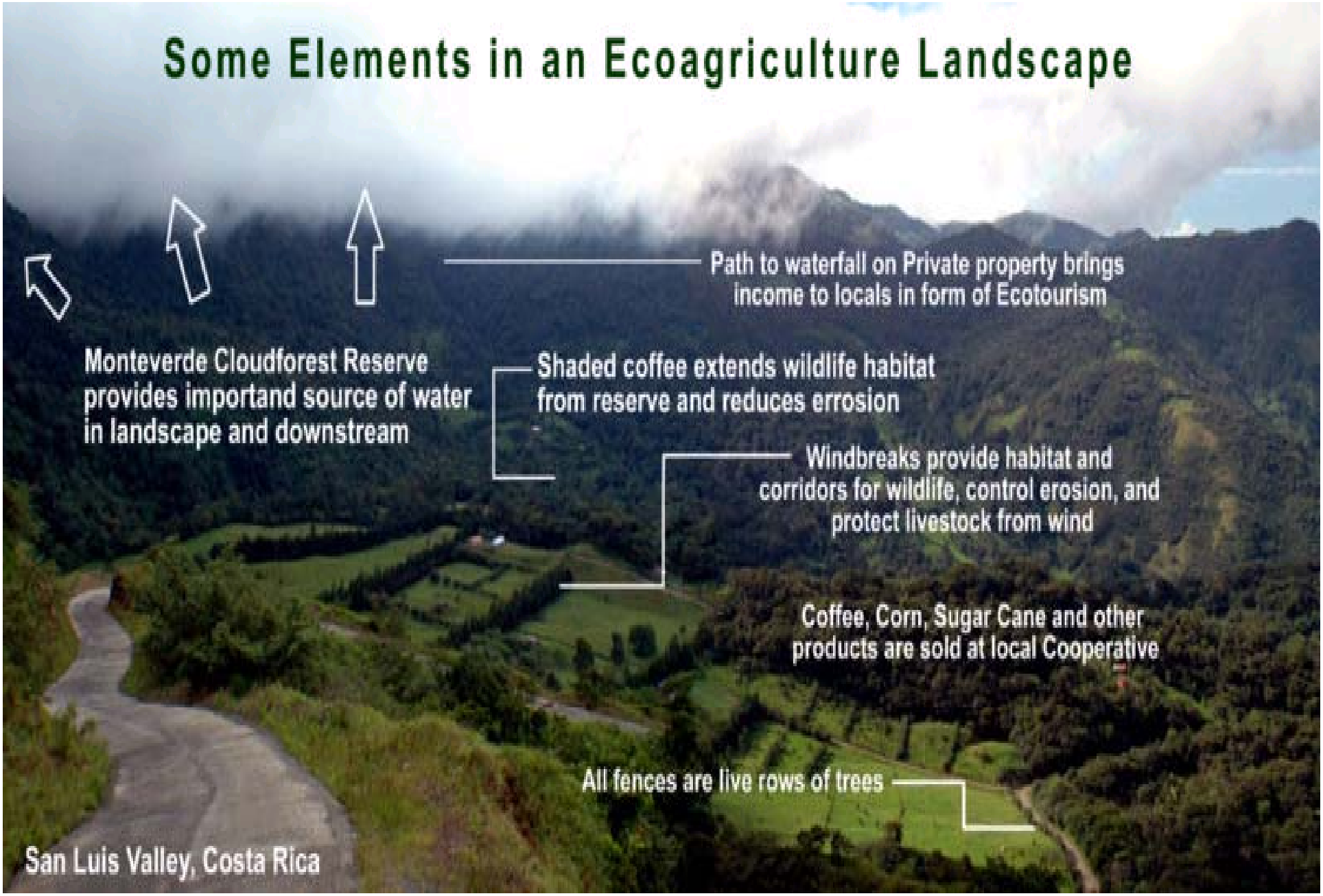
Heat and health

Cool down…air tree concept!

Viva Madrid

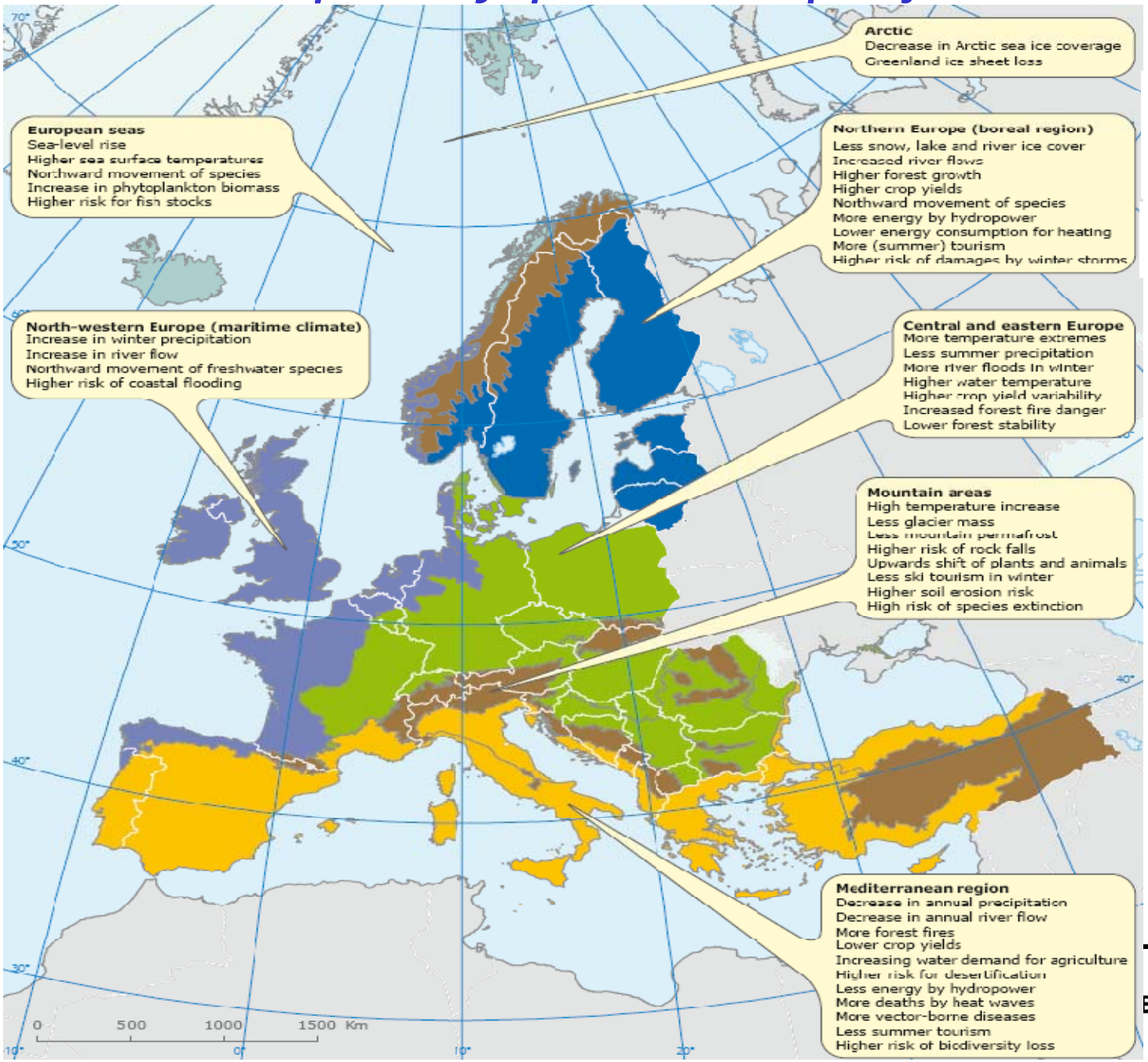
Crop for ...food...feed...fuel – All?

European Environment Agency


Some Elements in an Ecoagriculture Landscape
Path to waterfall on Private property brings income to locals in form of Ecotourism
Monteverde Cloudforest Reserve provides importand source of water in landscape and downstream
Shaded coffee extends wildlife habitat from reserve and reduces errosion
Windbreaks provide habitat and corridors for wildlife, control erosion, and protect livestock from wind
Coffee, Corn, Sugar Cane and other products are sold at local Cooperative
All fences are live rows of trees
San Luis Valley, Costa Rica

...or a fast cropping concept!

Europe key past and projected impacts



Arctic

Arctic — Greenland (not EEA member)

Boreal region

North-western Europe

Central and eastern Europe

Mountain areas

Mediterranean region

Main biogeographic regions of Europe (EEA member countries)

European Environment Agency

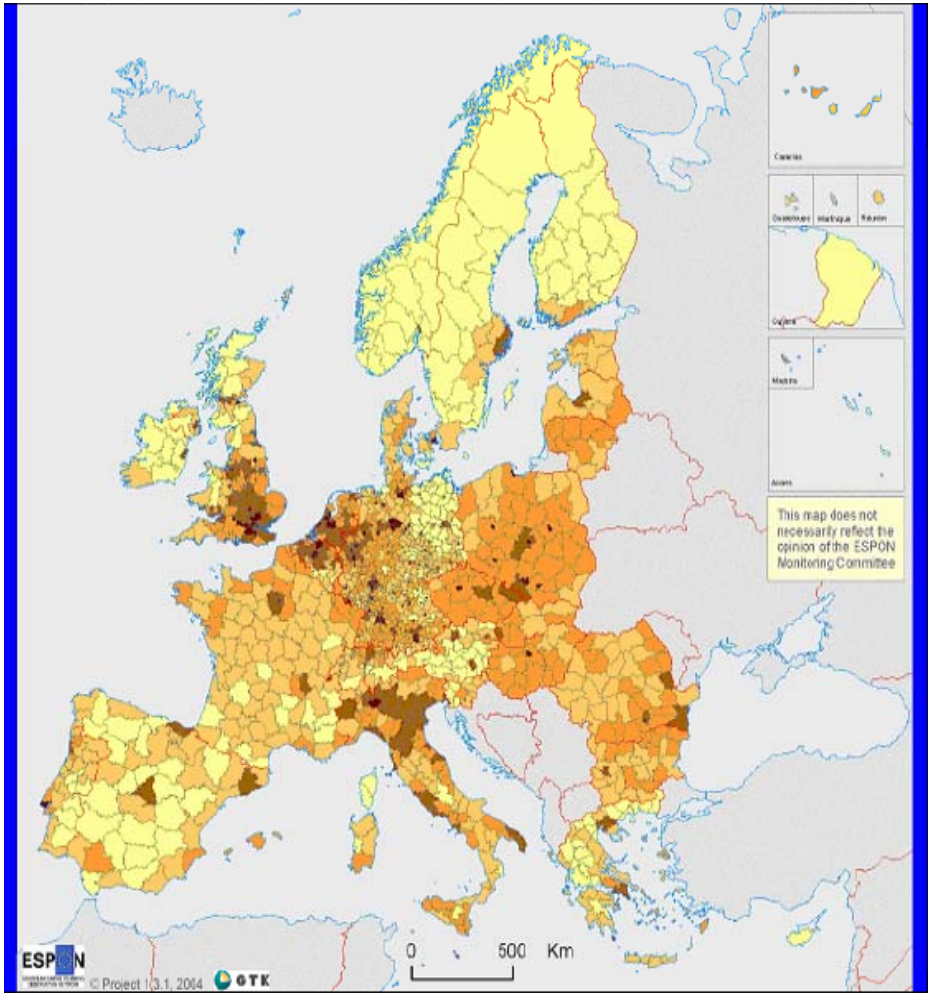
So far…sectoral adaptation plans and measures

- Adaptation often focused on flood management and defence
- Scope for other adaptation actions
  - Water demand management

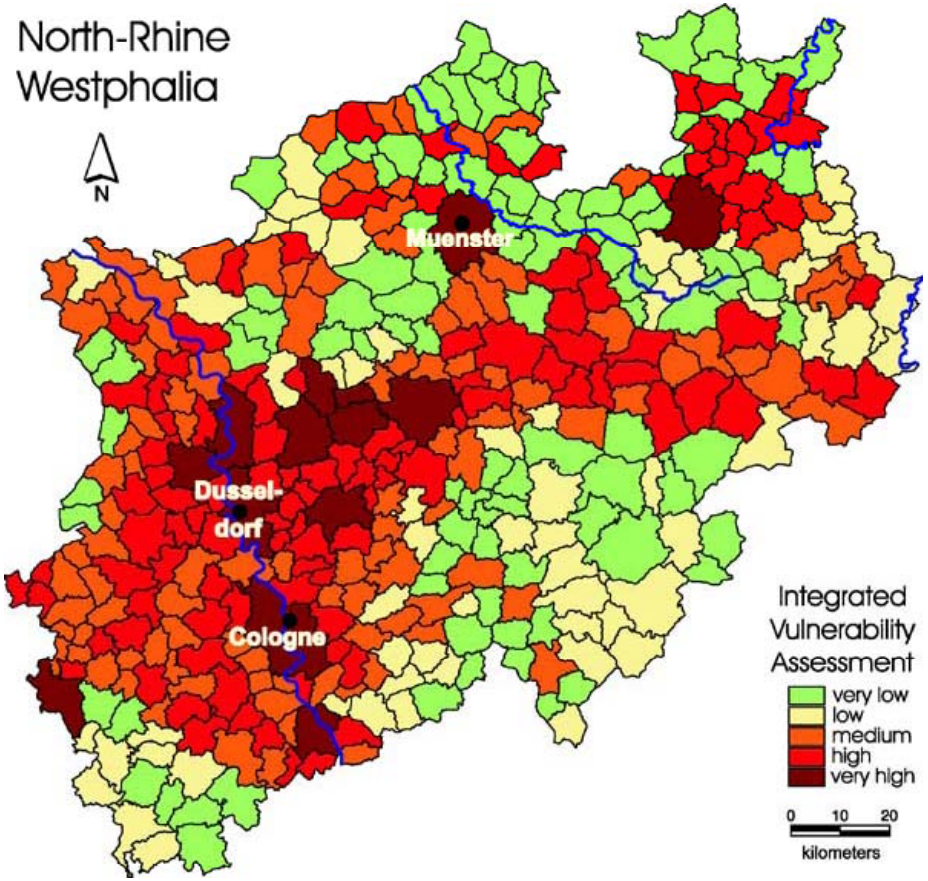
  (scarcity and droughts)
  - Natural hazard risk management
  - Reinforcing infrastructure
  - Land-use management and spatial pl
  - Greening of cities
  - Ecosystem management
  - Health/heat action plans, health system planning

Spatial analysis: from past trends to forward-looking assessments

Natural & technological hazards



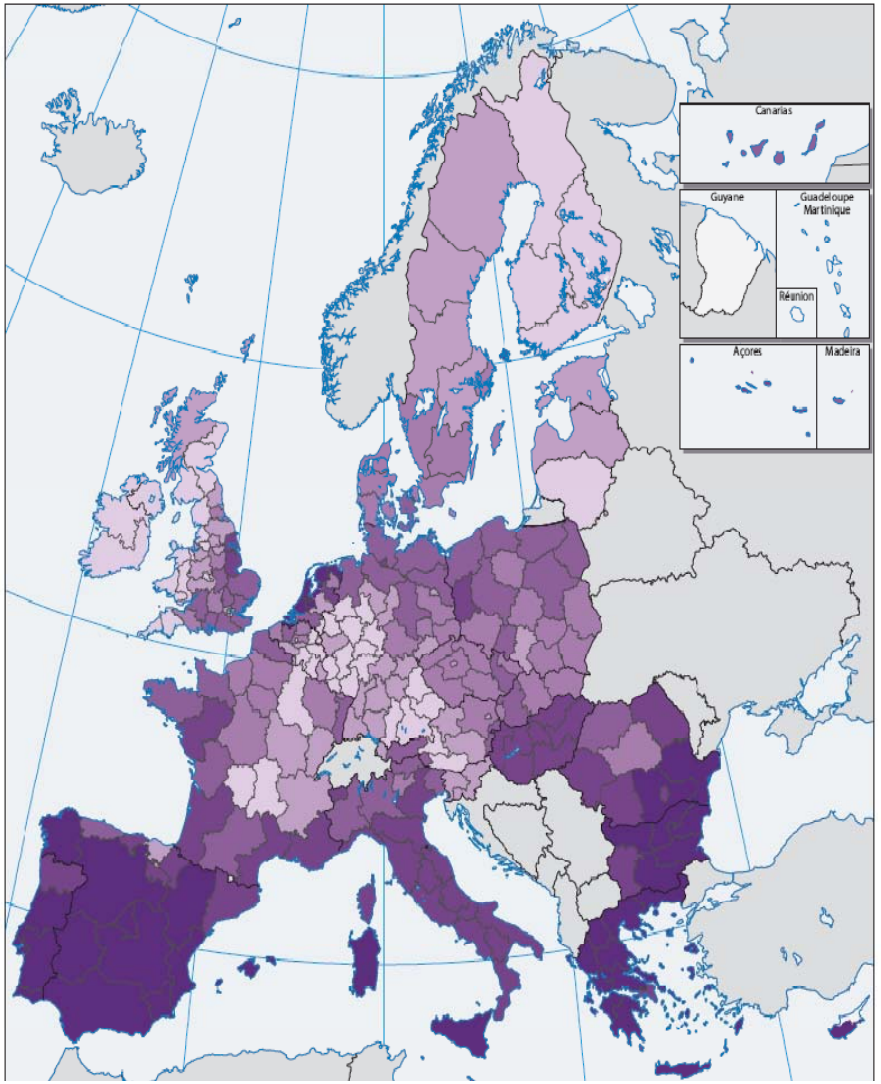
Combined (heat waves, forest sector, economic, extremes)



Vulnerability mapping

EU-wide integrated vulnerability mapping

- Develop a nested approach for defining vulnerability indexes across:
  - Time scales
  - Spatial resolutions
  - Human and natural systems
  - Exposure, sensitivity and socio-economic contexts
- Map vulnerability/resilience across Europe (e.g. at NUTS-II level, RB, grid) to facilitate the identification of response and management options.

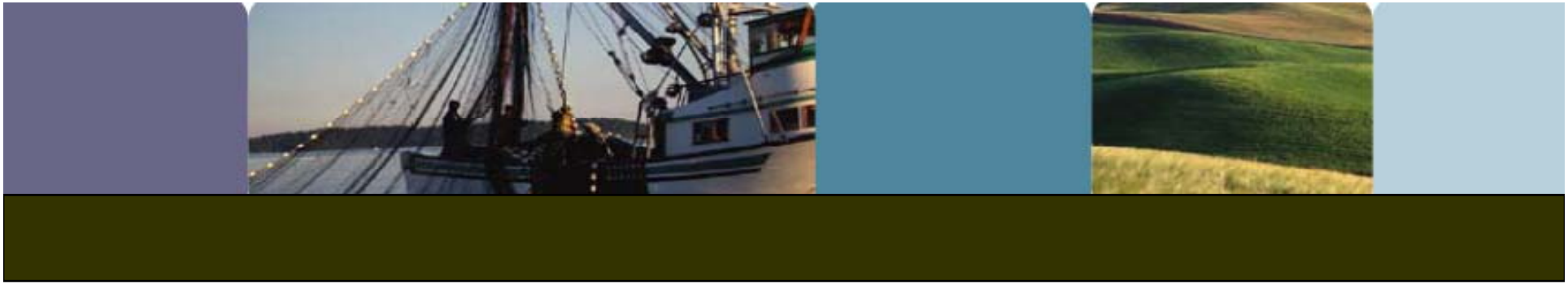


Contribution to cross-scales knowledge…a nested approach

- **EU Territorial integration: Spatial analysis and spatial planning (human and physical geography)**

→ ***Landscape perception…ecology…cultural landscape***

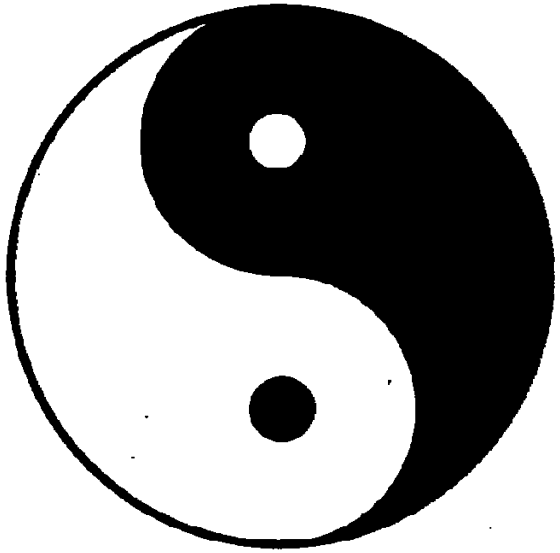
- **Accounting for changes over time and space:**
  - **Understanding patterns of change and informing on systems interactions**
  - **Valuation of natural assets and environmental expenditures**
  - **Tool for Sustainability Impact Assessment**
  - **Platform for building scenarios and models –measuring & anticipating changes**



AN EU ADAPTATION FRAMEWORK

MITIGATION AND ADAPTATION COMPLEMENTARY EFFORTS

MITIGATION



ADAPTATION

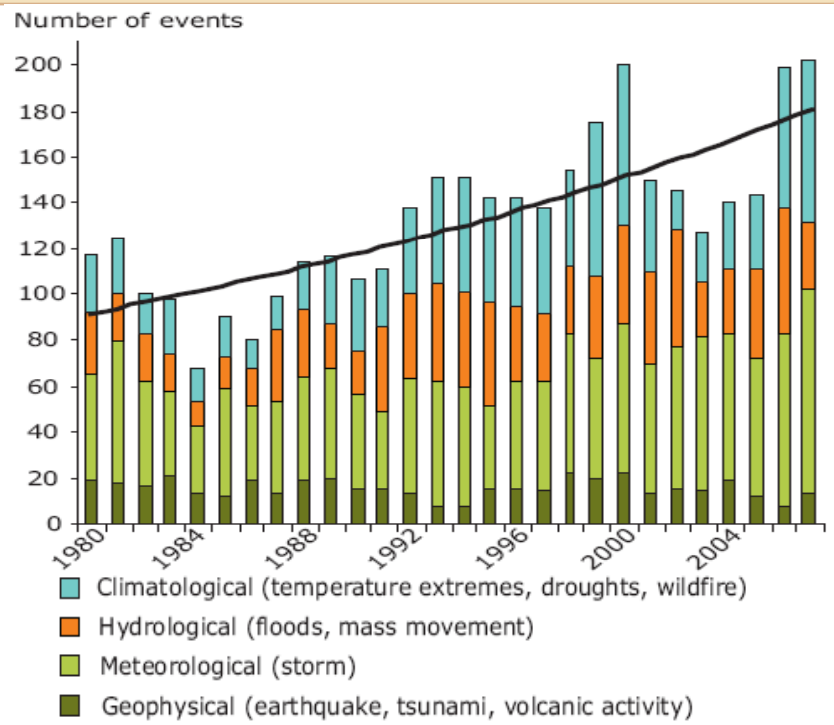
EU Goal: to maintain global warming at + 2°C (pre-industrial times)

- **This Goal will limit the risks and magnitude of climate change but will not avoid all impacts**
- **Adaptation will be a necessary and complementary effort to mitigation**
- **The more Mitigation the less Adaptation will be required and vice versa**
- **€ 175bn net investment by 2020 for mitigation**
- **€ 23-54bn /year by 2030 for adaptation**

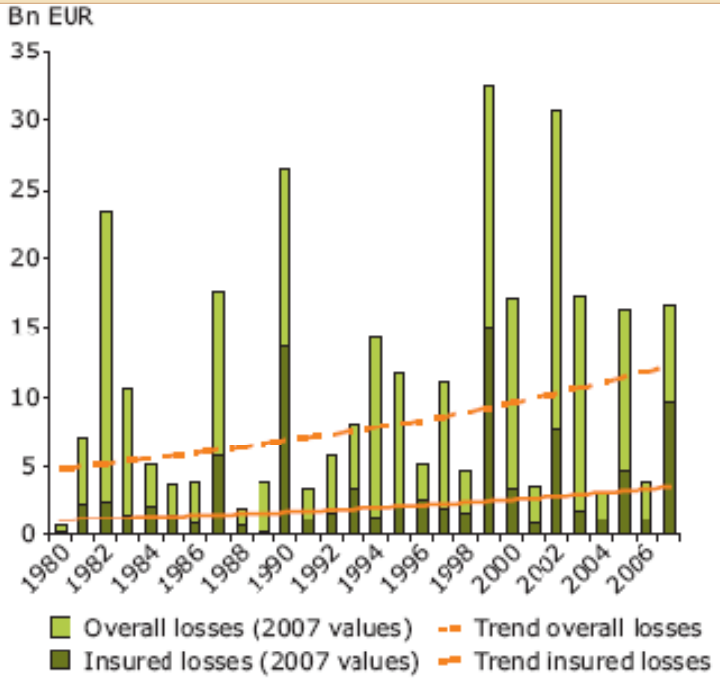
Direct losses from weather disasters

- The number of disastrous weather and climate related events in Europe increased by about 65% over 1998-2007 compared to the 1980s
- About 95% of economic losses caused by catastrophic events in Europe since 1980 are attributable to climate and weather. This is mainly due to socio-economic development but changing patterns of weather disasters are also drivers.

past



Natural disasters in Europe 1980-2007

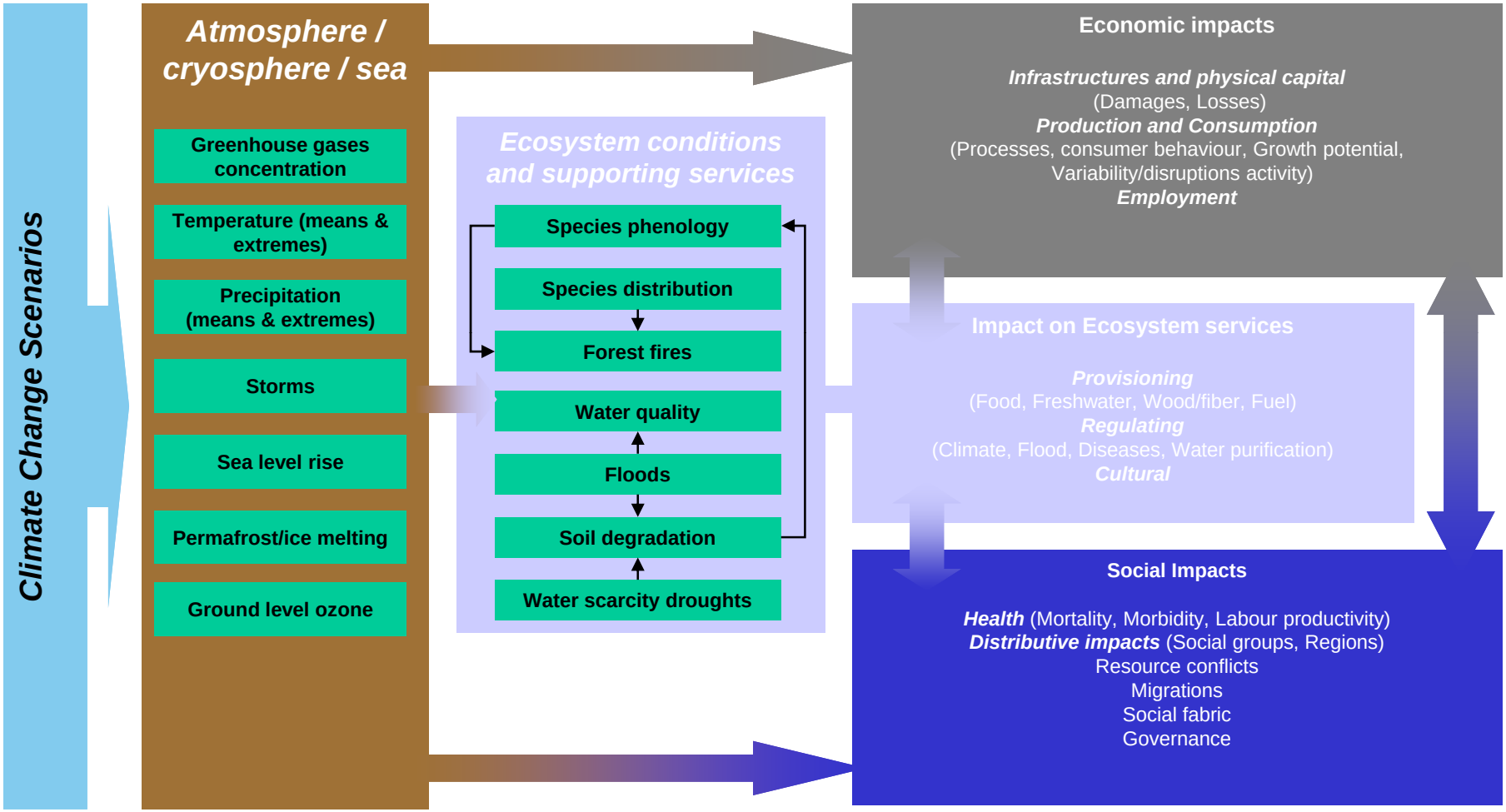


Overall and insured losses from weather disasters in Europe 1980-2007

- In the immediate future increasing disaster losses mainly due to societal change and economic development
- In the second half of the century more severe effects of climate change on economic assets

future

Impacts of Climate Change



Source: Environment DG based on (EEA, 2008) , OECD 2008 and TEEB. **Potential impacts are** all impacts that may occur given a projected change in climate, without considering adaptation.

Main Policy

WHITE PAPER on Adapting to climate change : Towards a European Framework for action

COM(2009)147 of 1.4.2009

European COMMISSION STAFF WORKING DOCUMENTS Accompanying the WHITE PAPER

- Adapting to Climate Change: the Challenge for European Agriculture and Rural Areas SEC(2009)417
- Human, Animal and Plant Health Impacts of Climate Change SEC(2009)416
- Climate Change and Water, Coasts and Marine Issues SEC(2009) 386

EU ADAPTATION FRAMEWORK

Objective:

To improve the EU's resilience to cope with the impacts of climate change

Phased approach:

- Phase 1: 2009-2012 – Lay ground work
- Phase 2: 2013 onwards - Implementation of a comprehensive adaptation strategy

EU ADAPTATION FRAMEWORK
-Phase 1: 2009-2012

- Strengthen the Knowledge/Evidence Base
- Mainstream climate Adaptation into key policy areas
- Employ a combination of policy instruments
- Financing issues
- Advance work internationally on Adaptation

Working in Partnership with EU, national , regional and local authorities

STRENGTHENING THE KNOWLEDGE BASE – AN ESSENTIAL STEP FORWARD

- Sound scientific results are paramount
- Current reporting/data mechanisms are fragmented
- EU Strategy will focus on strengthening the knowledge base
- Important starting point – European Clearing House Mechanism (CHM)

CLEARING HOUSE MECHANISM

- Europe wide data repository and platform for knowledge

- Clearing House Mechanism will be a one-stop shop, web-enabled system providing access to information sources, documents, data, case studies etc..

- Expected to be operational in 2011

- Scoping study underway -in parallel, methods, models, data sets and prediction tools will be developed

Benefits and users of an EU Clearinghouse on impacts, vulnerability and adaptation

- Contributes to the implementation of the Commission White Paper on Adaptation (and the Shared Environmental Information System)
- Provides networking for existing and future thematic and national/regional networks and organisations
- Goes beyond national borders (transboundary impacts)
- Access to results of research projects (EU RTD, national)
- Supports the coordination of EU contributions to the UNFCCC
- Users: European (EC, EP, EEA), National (various ministries), Trans-national (e.g. river basins), Sub-national (regional and local authorities), others (NGOs, businesses, citizens)

MAINSTREAM ADAPTATION INTO KEY POLICY AREAS

Step by step approach - based on solid scientific and economic analysis

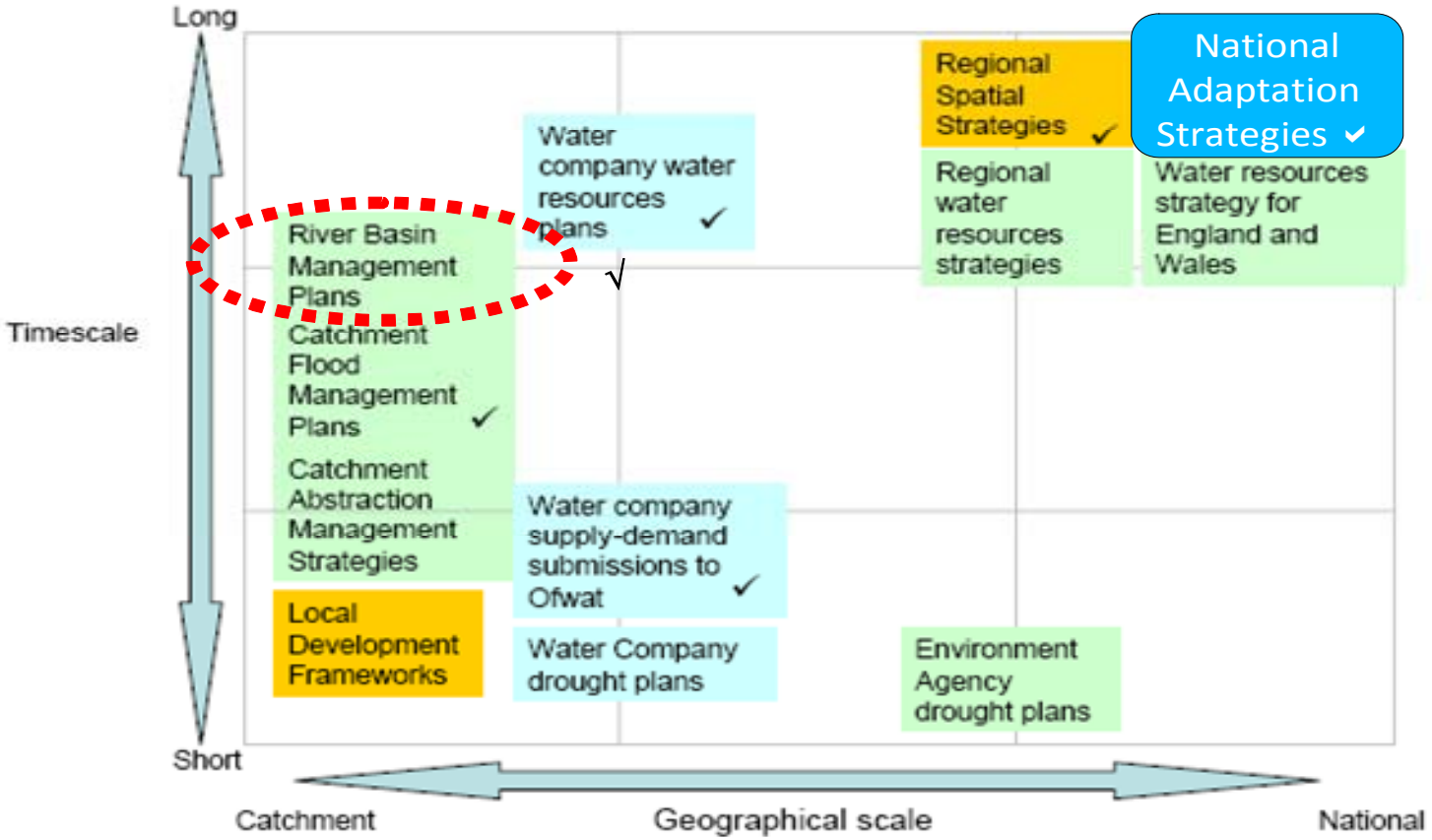
For now: "No Regrets" measures – funding: existing national or EU Rural Development or Regional Funds

Review and assess appropriate options by sector and implement in relevant EU policies (Agriculture, Health, Transport, Energy etc.)

Develop Adaptation Strategies outlining the action required

Draft EU Guidance: How to adapt to climate change with regard to water issues and EU water legislation

- Being prepared by countries and Commission (Water FWD) for river basin management plans (RBMP) due in 2015, only few 2009 RBMPs include adaptation



Wade et al., adapted by EEA

Employ a Combination of Policy Instruments

- European Economic Recovery Plan – contains a number of proposals modernising European infrastructure, promoting energy efficiency in buildings etc.)
- Insurance and other financial services products Market Based Instruments
- EU-ETS – using revenue generated from auctioning allowances for adaptation purposes

WORKING IN PARTNERSHIP

- Close co-ordination with EU Member States is essential in preparing effectively to address the impacts of Climate Change

- Establish Impact and Adaptation Steering Group (IASG) with Member States

- IASG will develop the 4 Pillars and take Adaptation Framework forward

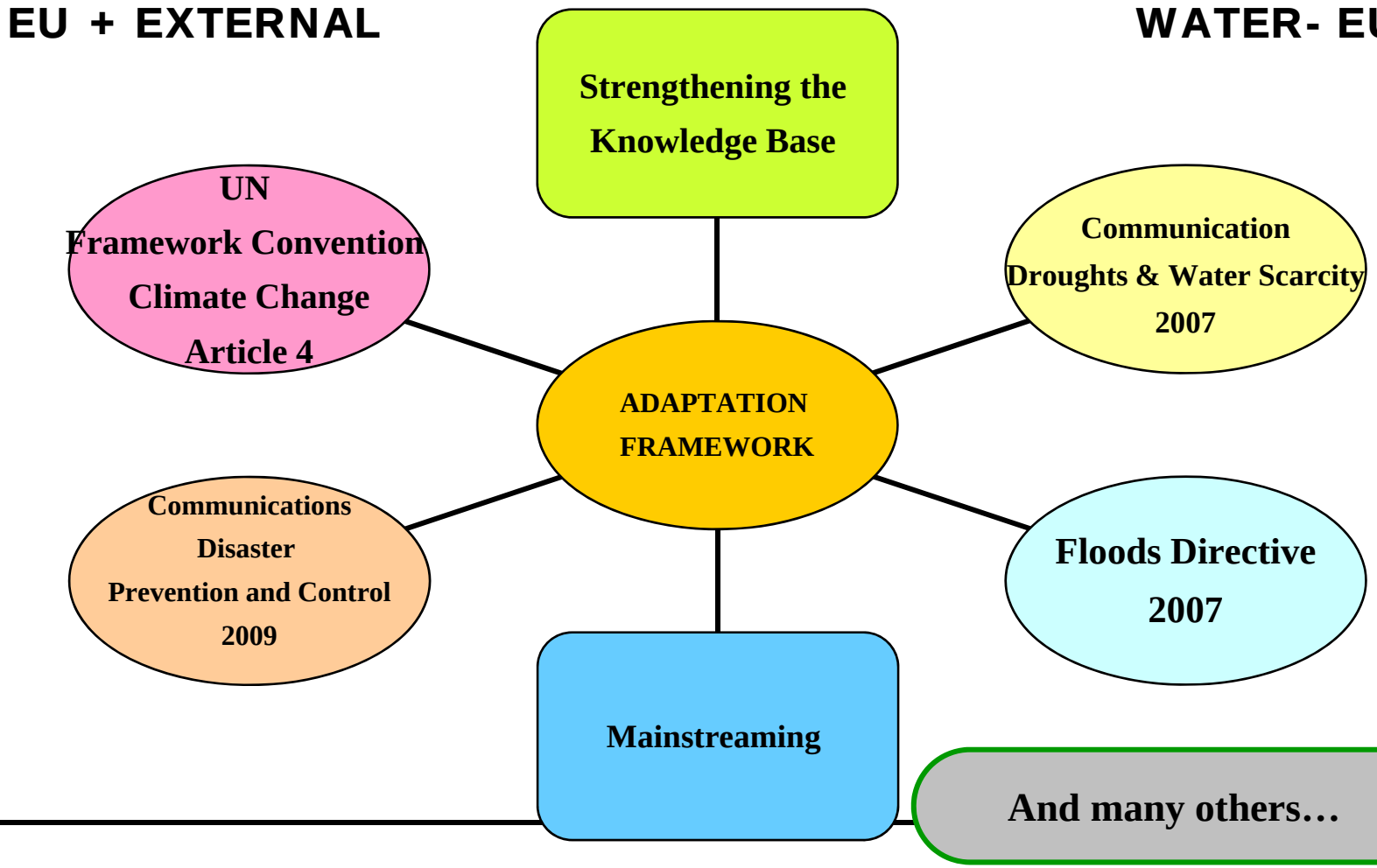
- Steering Group will be supported by technical groups and will consult with civil society and the scientific community

Last but not least…Data and information needs impacts and adaptation

- Improved monitoring and reporting:
  - National monitoring (GCOS essential climate variables)
  - Regular national or EU-wide monitoring at right scales (river basin etc)
- Improved and coordinated scenarios:
  - High resolution scenarios regional level
  - Consistency between climate and socio-economic scenarios
- Improved understanding of vulnerability
  - Models and methods
- Information on good practices in adaptation
  - Effective adaptation measures and costs
  - Avoid 'mal-adaptation'
- Indicators to monitor adaptation actions and effectiveness
- Better information exchange mechanisms

EU and national research and GMES could help fill many of these gaps, while the proposed EU Clearinghouse can provide the current information that can already now support adaptation actions

INITIATIVES LINKED TO ADAPTATION




Maak ruimte voor klimaat!
Working together with water
A living land builds for its future
Findings of the Deltacommissie 2008
HM Government
Adapting to climate change in England
A FRAMEWORK FOR ACTION
defra
Ministry of Agriculture and Forestry
Finland's National Strategy for Adaptation to Climate Change
Publication 1a/2005
Observatoire national sur les effets du réchauffement climatique
Stratégie nationale d'adaptation au changement climatique
La documentation Française
Strategi for tilpasning til klimaændringer i Danmark
Regeringen
PLAN NACIONAL DE ADAPTACIÓN AL CAMBIO CLIMÁTICO
MARCO PARA LA COORDINACIÓN ENTRE ADMINISTRACIONES PÚBLICAS PARA LAS ACTIVIDADES DE EVALUACIÓN DE IMPACTOS, VULNERABILIDAD Y ADAPTACIÓN AL CAMBIO CLIMÁTICO
Die Bundesregierung
Deutsche Anpassungsstrategie an den Klimawandel
vom Bundeskabinett am 17. Dezember 2008 beschlossen
NEMZETI ÉGHAJLATVÁLTOZÁSI STRATÉGIA
2008-2025
FINLAND
ESTONIA
LATVIA
LITHUANIA
BELARUS
KAZAKHSTAN
UNITED KINGDOM
NETHERLANDS
GERMANY
POLAND
BELGIUM
LUXEM-BOURG
CZECH REPUBLIC
SLOVAKIA
FRANCE
LIECHTEN-STEIN
AUSTRIA
HUNGARY
SWITZER-
SPAIN
PORTUGAL
GEORGIA
ARMENIA
IRAQ
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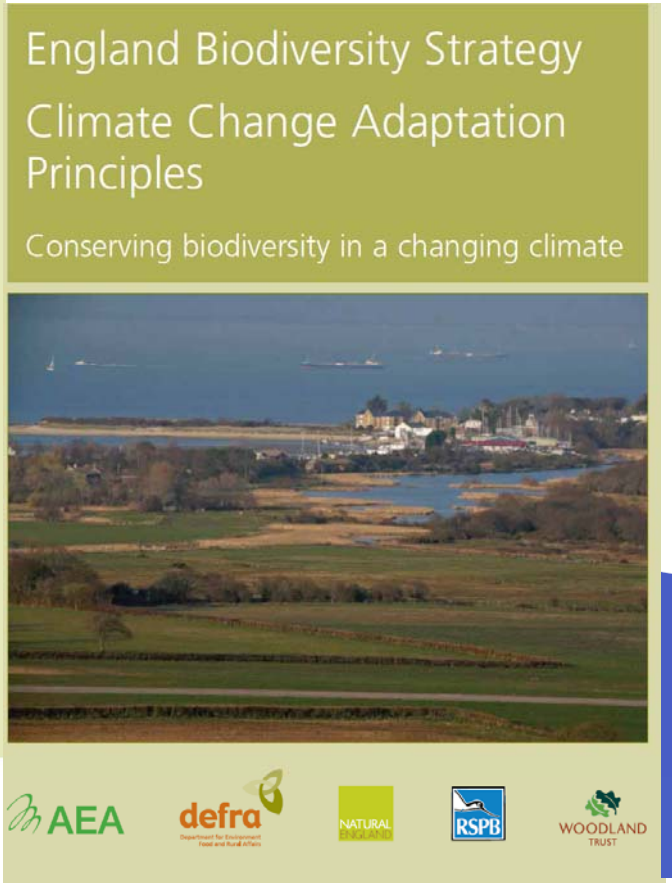
Status of development of national adaptation strategies

Adopted a NAS	Preparing a NAS	IVA assessments
Finland (2005)	Czech Republic	Austria
France (2006)	Norway	Greece
Spain (2006)	Romania	Iceland
Netherlands (2007)	Estonia	Ireland
Denmark (2008)	Latvia	Lithuania
United Kingdom (2008)	Portugal	Sweden
Germany (2008)		Switzerland
Hungary (2008)		

Source: EEA, 2008; PEER, 2009

UK approaches to biodiversity and climate change adaptation

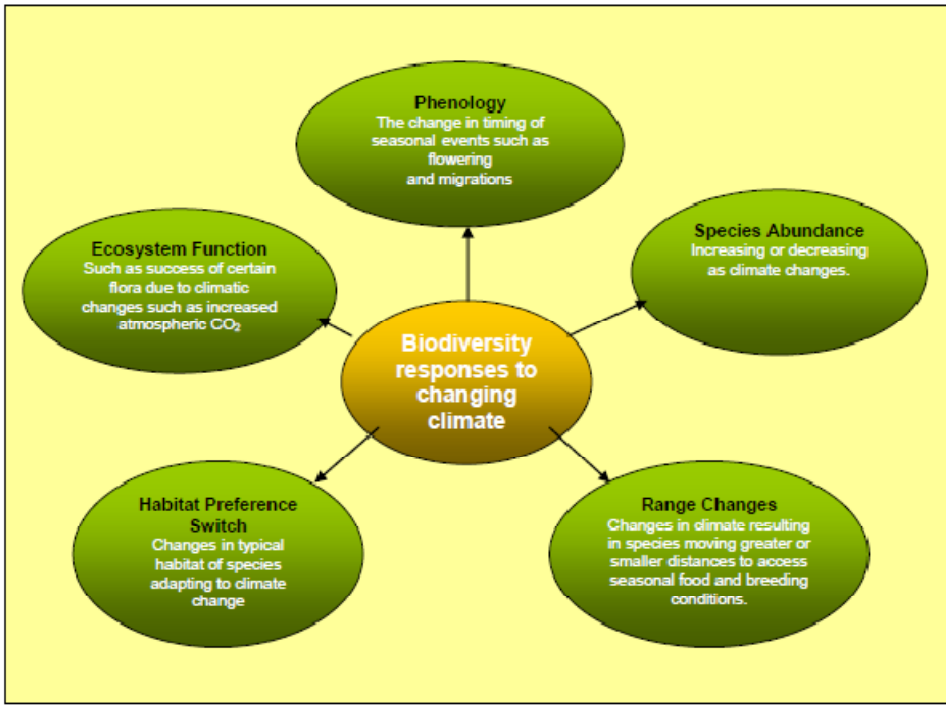
Defra, 2007



Defra, 2008

Natural England, 2009

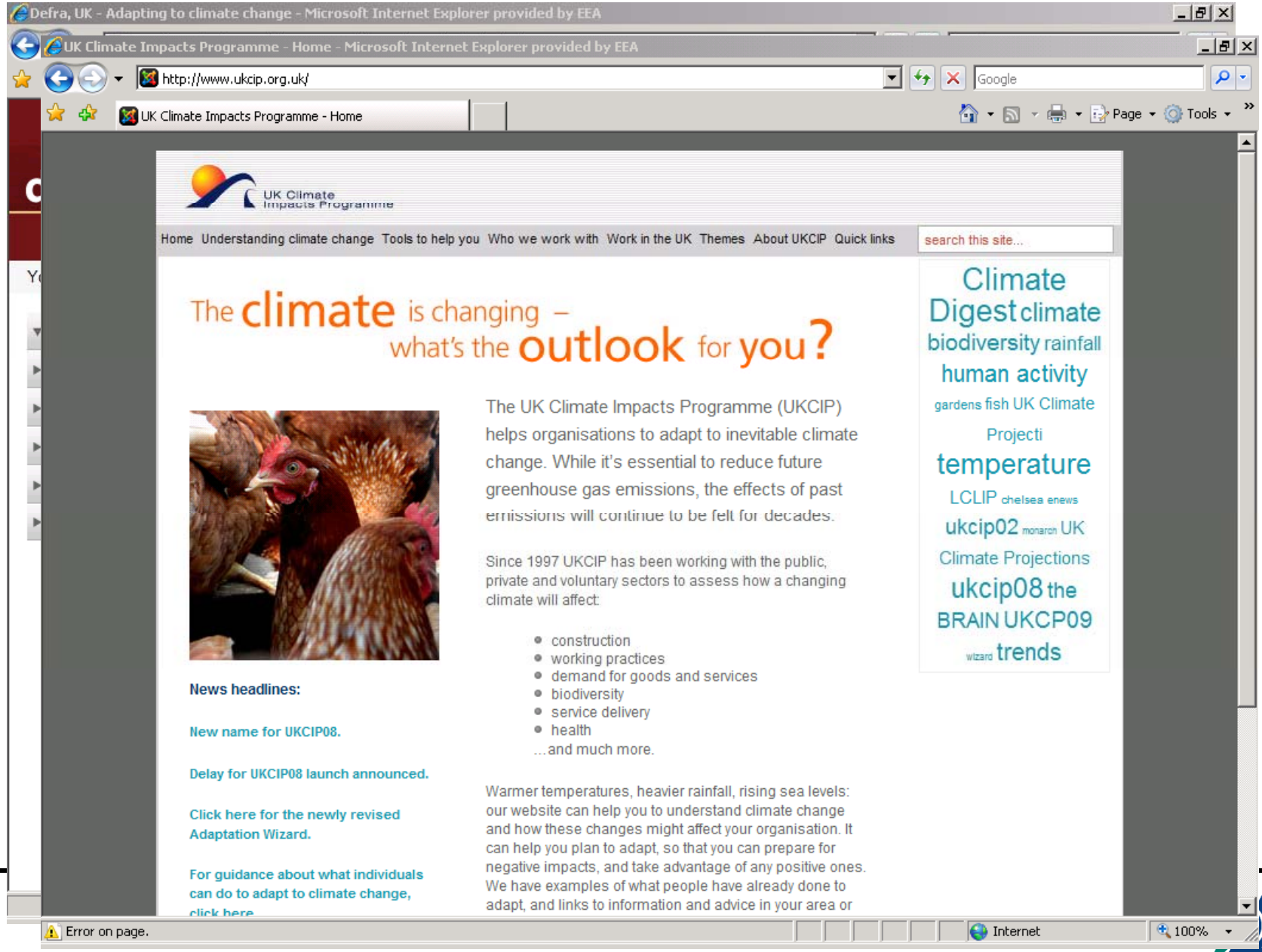
Responses by biodiversity/ecosystems to climate change and main adaptation principles (UK)



Natural England, 2009

Defra, 2008

Example of national plan/portal (UK)



Example of national plan/portal (DE)

Examples of other on-going studies

- EC's studies at DG REGIO, DG MARE (coasts), DG ENV (vulnerability indicators; biodiversity), DG AGRI
- INTERREG and other relevant research projects include:
  - ASTRA (Developing Policies & Adaptation Strategies to Climate Change in the Baltic Sea Region)
  - AMICA (Adaptation and Mitigation — an Integrated Climate Policy Approach)
  - ADAGIO (Adaptation of Agriculture in European Regions at Environmental Risk under Climate Change)
  - BRANCH (Biodiversity Requires Adaption in Northwest Europe under a CHanging climate)
  - CIRCLE (Climate Impact Research for a Larger Europe)
  - ClimChAlp (Climate Change, Impacts and Adaptation Strategies in the Alpine Space)
  - ESPACE (European Spatial Planning — Adapting to Climate Events).

Some conclusions - What to adapt or/and improve

- Governance structures: to reflect multiple levels of responsibilities and benefit transfers
- Spatial development perspective (vision) and physical planning (cost-effective implementation)
- Information sharing and participative processes to decision-making

Land dynamics & territorial cohesion: the adaptation challenge

"By examining all uses of land in an integrated manner, it makes it possible to minimize conflicts, to make the most efficient trade-offs and to link social and economic development with environmental protection and enhancement, thus helping to achieve the objectives of sustainable development."

UNCSD, Rio 1992- Agenda 21, Chapter 10

- http://www.eea.europa.eu/themes/climate
- **http://ec.europa.eu/environment/climat/climate_action.htm**
- **http://ec.europa.eu/environment/climat/adaptation/index_en.htm**