Water management challenges in Central and Eastern Europe – implications for hydrological modelling

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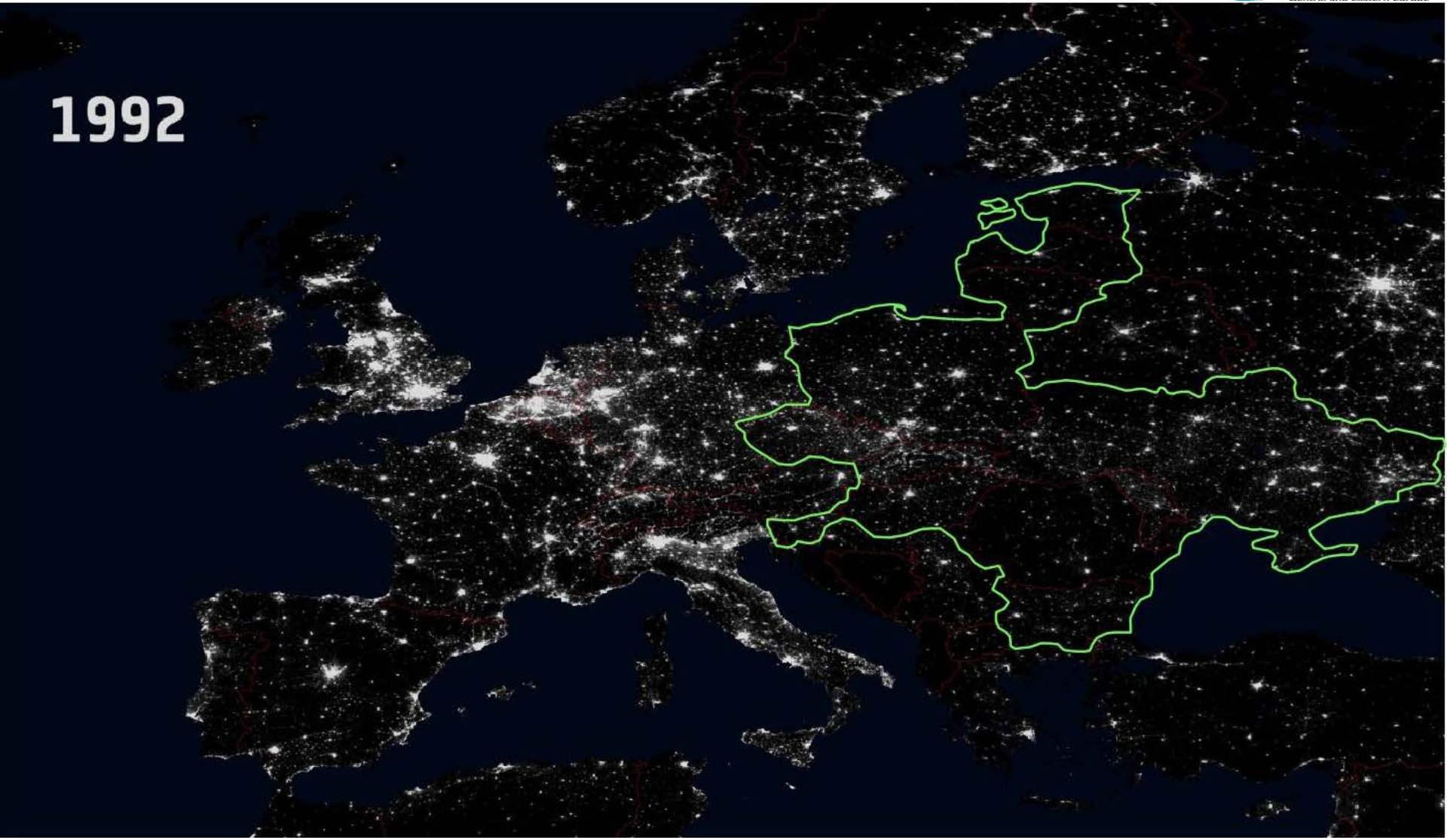
Outlook

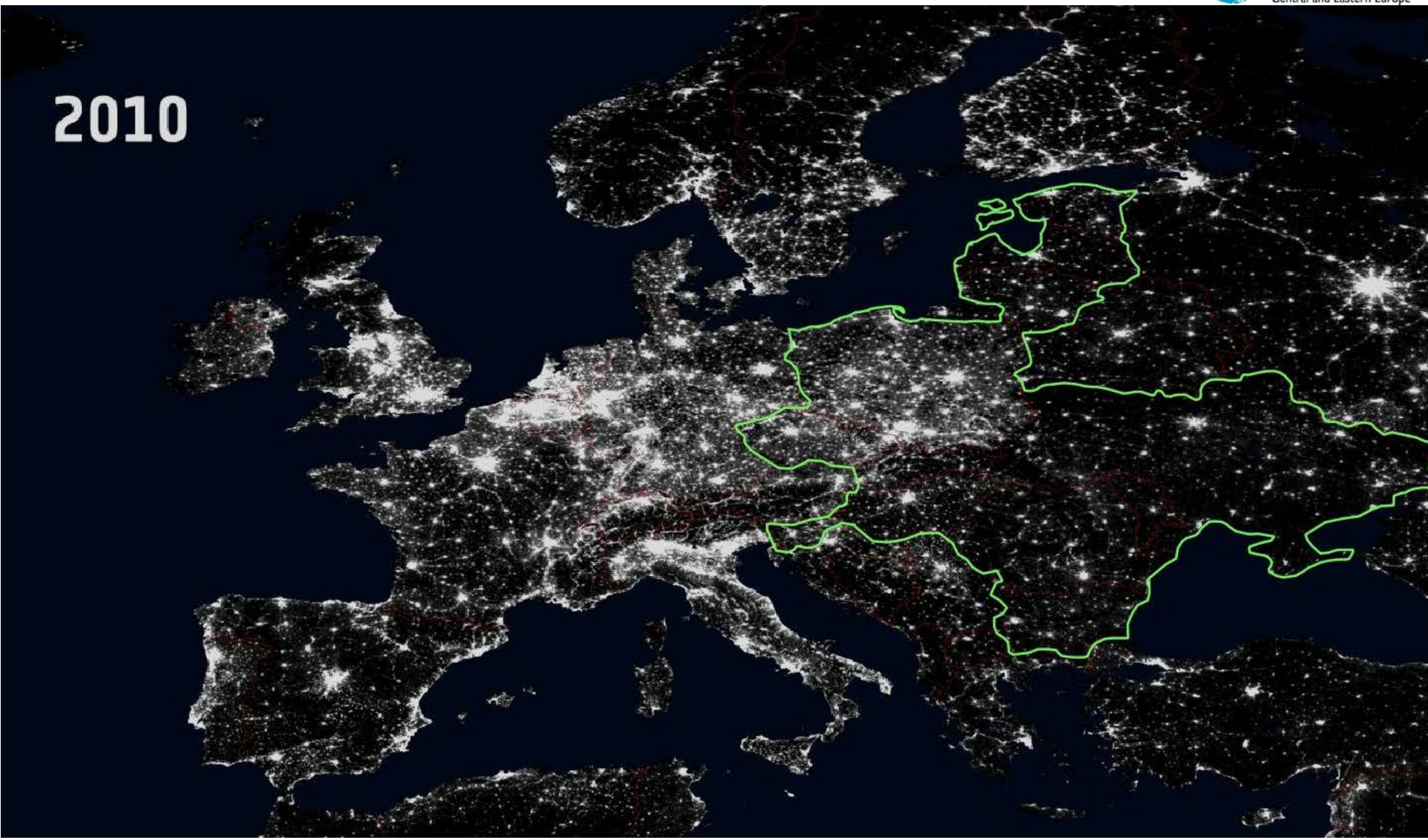
- Introduction
- Water management issues in CEE
- Examples of challenges
- Conclusions

Basic info

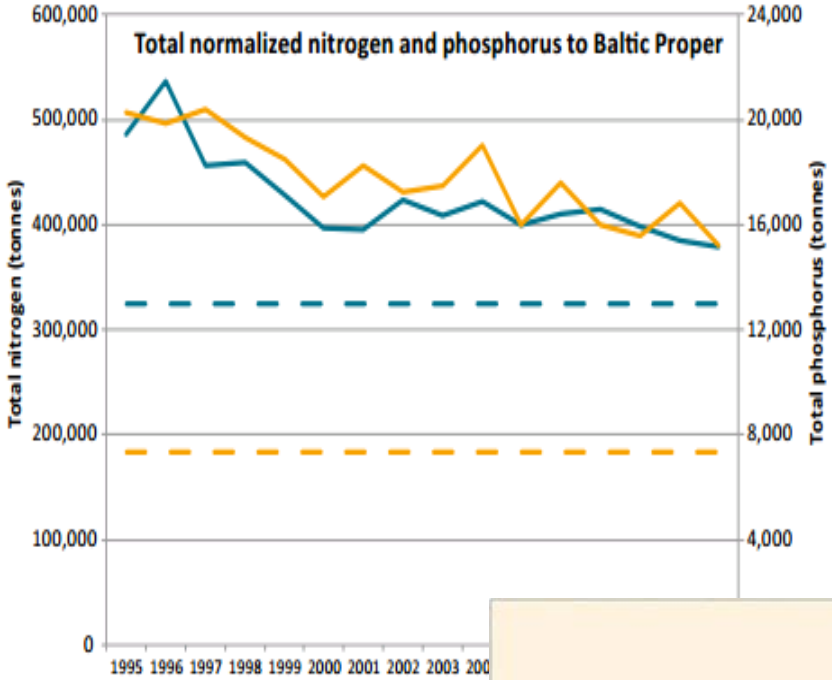
- Population 152 000 000 (25% Europe population)
- Area 2 030 000 km^2
- 12 countries and 160 partner organisations,
- Established in 1998 (at Technical University Warsaw

The GWP CEE region


1992


2010


Floodplain Forests in Europe
Alluvial and moist lowland forests
Mediterranean wet lowland and alluvial forests and scrub
Elbe
Vistula
Oder
Rhine
Seine
Loire
Danube
Lake Geneva
Garonne
Rhone
Po
Danube
Ebro
Duoro
0 km 1000
Adapted from UNEP-WCMC map



Global Water Partnership
Central and Eastern Europe

SWOT Analysis

- Conducted in period V- IX 2016 for planning purposes of GWP,
- Made on the basis of national documents regarding Water Framework Directive and Flood Directive implementation, River basin Management Plans, Sustainable Development Goals, Climate Policy and the interviews of partnership organisation,
- Compiled by dr Janos Feher – GWP Hungary.

SWAT analysis

Global Water Partnership Central and Eastern Europe

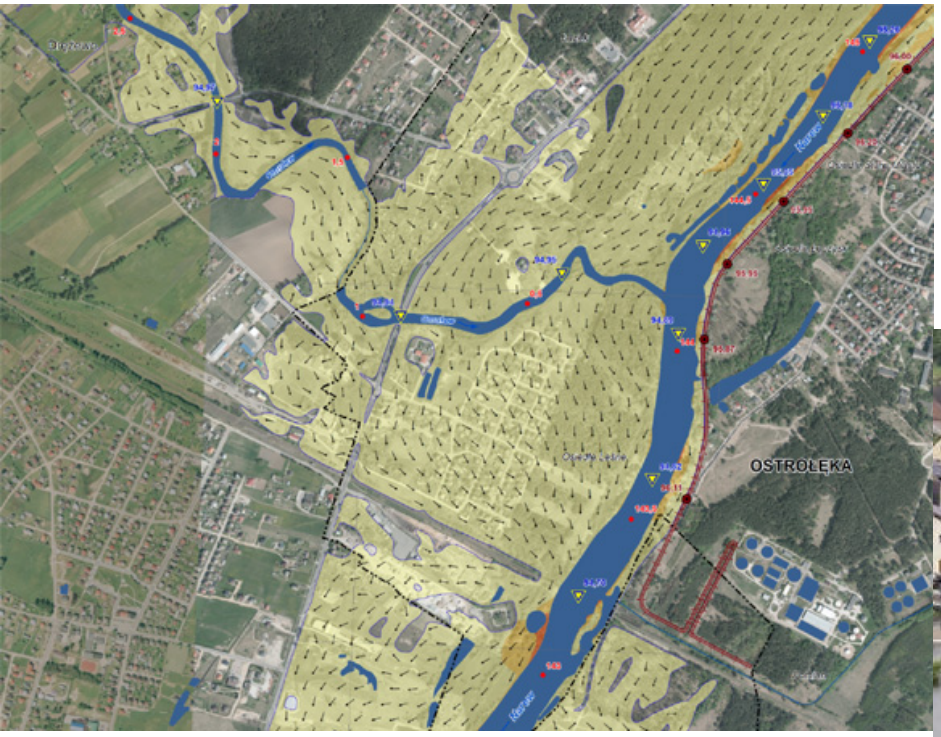
Strengths	Weaknesses
• All countries have dedicated water ministries & administration, strong policies, strategies & laws on WRM and W&S • Countries need and believe in stakeholder engagement • Most countries are guided by EU priority and policy framework • Most countries have good technical capacity and institutions • There is acknowledgement for the need to coordinate across sectors • Appreciation for knowledge lead solutions	• Poor state of / inadequate water related infrastructures in some countries • In some countries week implementation of policies • Horizontal coordination between sectors & national administration should be further improved • Investment level in water resource management and infrastructure renewal is different between EU and non-EU countries of the region • Inadequate information and monitoring systems in some countries • The knowledge level and understanding of IWRM decreased in most of the countries due to frequent changes in administration • Unfortunately, research capacity has been reduced on water related issues in most of the countries

SWAT analysis

Global Water Partnership Central and Eastern Europe

Opportunities	Threats
• Access to new climate funds to handle: climate variability, weather extremes, recent droughts & floods & IWRM • Further strengthen IWRM policies/plans • Update water & sanitation policies, and their implementation especially, but not exclusively in non-EU countries of the region • Topical/supported - SDGs and nexus and need for integrative approaches re: building on WRM • Water issues accross sectors • Due to increased brain drain, there is a need for capacity development and knowledge exchange	• Low water investments in non-EU countries of the region • In the light of climate change scenarios depleted water resources in some areas within the region • Conflicting work force situations: Unemployment in some regions, which needs for job creation, while shortage in skilled employees – due to brain drain – undermining the economic development. • Lack of cohesive policy frameworks, agreements (multinational and/or bilateral) for water quantity issues • Not appropriate coordination and harmonisation between sectors • Sustainability of local water management institutions • Climate change, floods, droughts

Flood Directive



Changes in annual average flow predicted for 2021-2050 compared to 1971-2000

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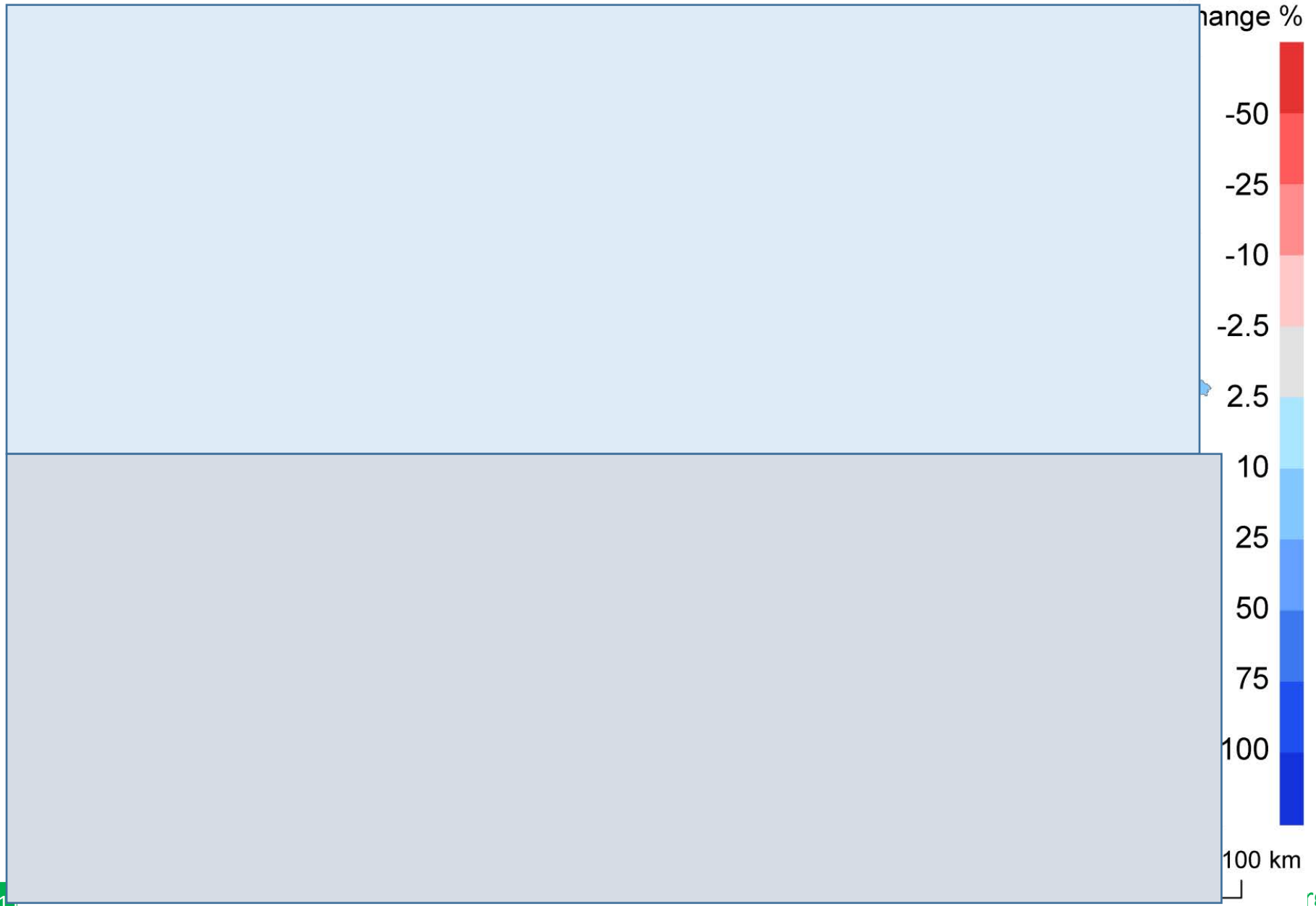

Important water bodies and regional organisation

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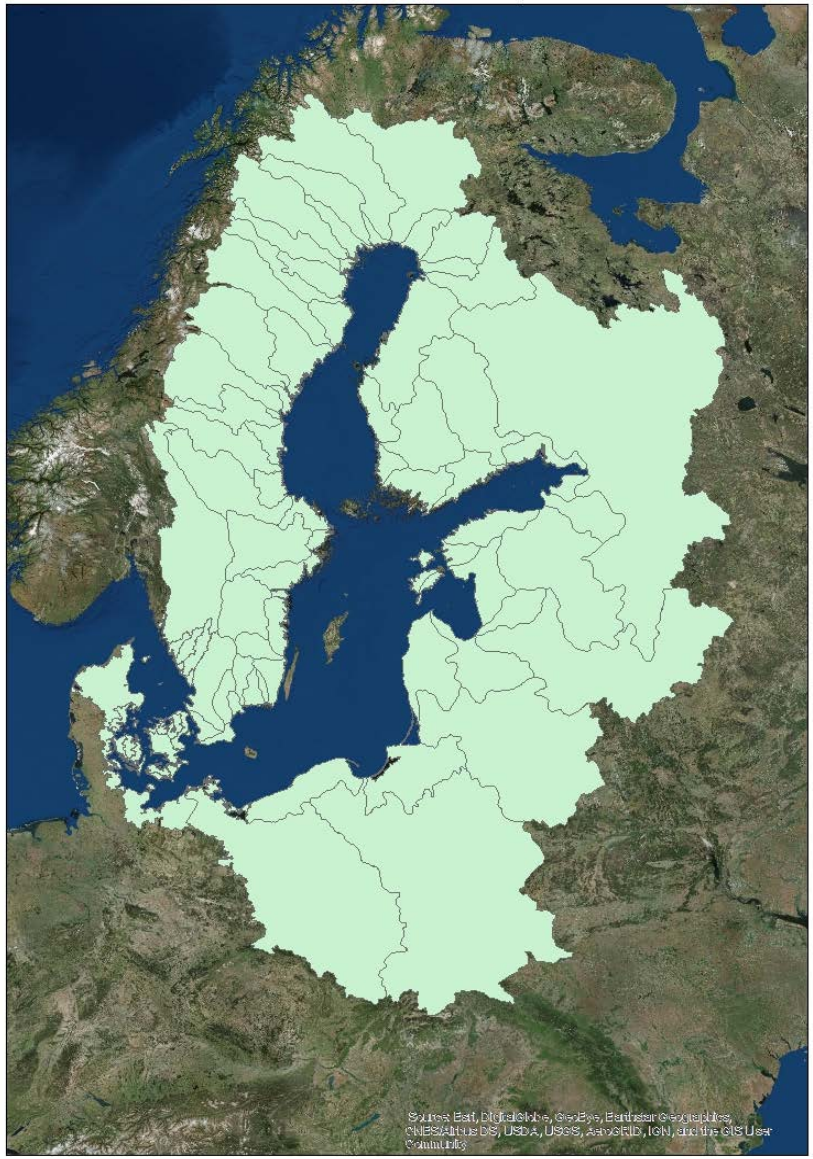
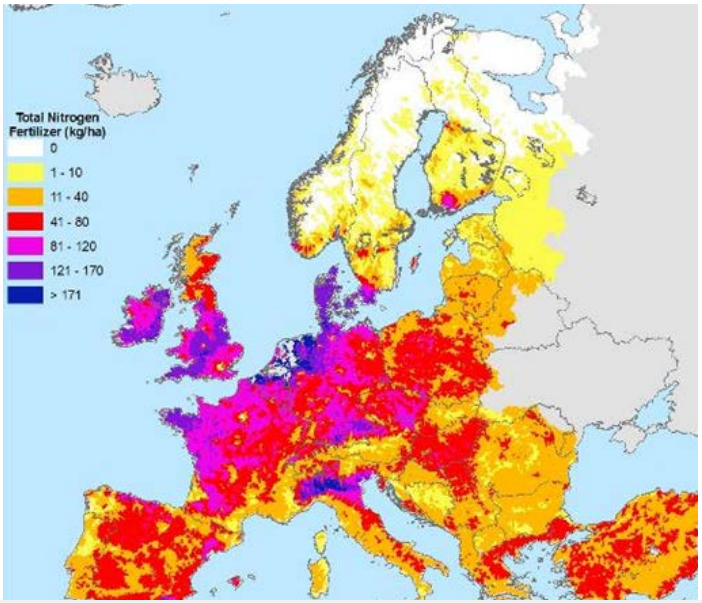
Baltic Sea catchemnt area, HELCOM

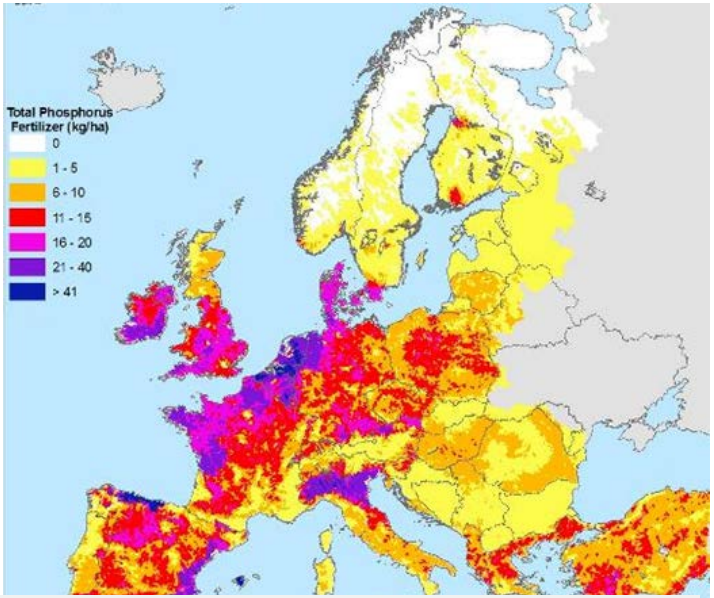


Catchement of the Black Sea, Black Sea Comission

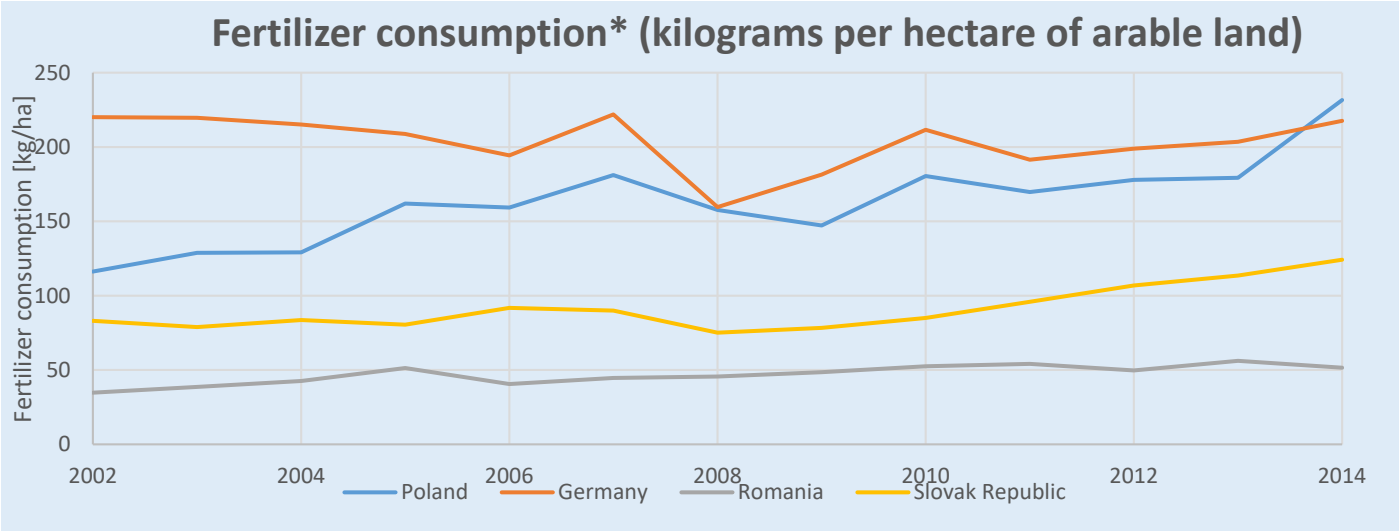
Danube River Basin District, ICPDR

Trends in mineral fertiliser rates in Europe



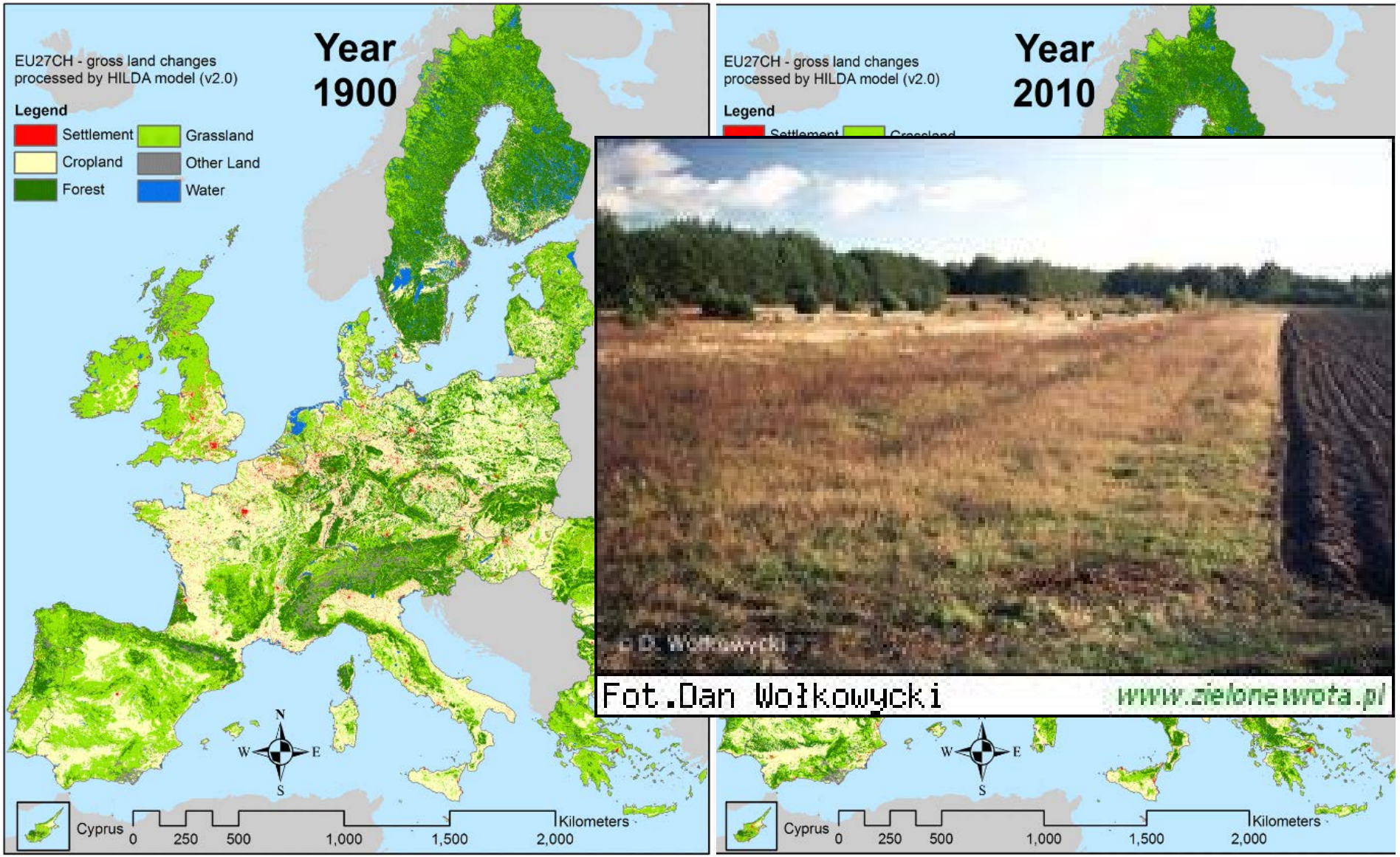


Total nitrogen and phosphorus fertiliser application, 2005; *Source: http://ec.europa.eu/eurostat*



*Fertilizer consumption measures the quantity of plant nutrients used per unit of arable land. Fertilizer products cover nitrogenous, potash, and phosphate fertilizers (including ground rock phosphate); Source: http://data.worldbank.org/indicator/

Changes in the agricultural landscape (1)



Historic land changes of Europe; Source: http://www.wur.nl/en

Changes in the agricultural landscape (2)

Landscape features gaining interest e.g. small retention

Water resources	Systems
Landscape (habitat) retention	Systems that create appropriate land use structure through the set up of arable lands, grasslands, forests, lands of ecological use, water holes
Soil retention	Crop systems that affect water management in soil profile, particularly the increase of potential water retention in soils
Ground waters	Cultivation and reclamation systems to inhibit the surface runoff and to increase the recharge of ground water reservoirs
Surface waters	Hydrotechnical systems of distribution and management of water including the construction of small reservoirs, outflow control from the draining systems

Conclusions

- We should care about the users (:
- Working in different scales (however there is a bigger demand for projects on country and regional level) ,
- Being aware of landscape „dynamics”,
- Modelling of (semi)natural habitats,
- Including new elements in an agro-system, which should be checked for the effectiveness in improving water quantity and quality.