CLEAR ANCE

CircuLar Economy Approach

to River pollution by Agricultural Nutrients

with use of Carbon-storing Ecosystems

UNIWERSYTET WARSZAWSKI

Green Management Group

IGB

GREIFSWALD MIRE CENTRE

ERNST MORITZ ARNDT UNIVERSITÄT GREIFSWALD

AARHUS UNIVERSITY

European Commission

Radboud Universiteit Nijmegen

GRÜNE LIGA Netzwerk Ökologischer Bewegungen

Water JPI

JOINT CALL 2016

FNR Fachagentur Nachwachsende Rohstoffe e.V.

CAU Christian-Albrechts-Universität zu Kiel

The National Centre for Research and Development

GETIDOS GETTING THINGS DONE SUSTAINABLY

Innovation Fund Denmark

Water JPI

European Commission

JRC TECHNICAL REPORTS

Algal bloom and its economic impact

Sanseverino, Diana Conduto, Luca Lettieri

LAND MARINE ATMOSPHERE EMERGENCY MANAGEMENT CLIMATE CHANGE SECURITY

Copernicus

ISSUE 08 / SEPTEMBER 2013

esa

THE PLAGUE OF TOXIC ALGAE

None of the seas around Europe escape the phenomenon of algal blooms. These blooms result from the normal process of plankton growth in spring. However, some species of plankton can form harmful algal blooms (HABs) that pose an environmental hazard, affecting human and animal health, and even causing death. In recent years, the frequency and extent of HABs has increased considerably. Reasons for this include the increased discharge of substances such as fertilizers into the water from agricultural, industrial and urban activities. Scientists are currently investigating links between the frequency of algal blooms and changes in the temperature and salinity of oceans associated with climate change.

Facts

An algal bloom is the rapid multiplication of microscopic aquatic plants that concentrate as an intense bloom in the water. While individually harmless, in high numbers they may deplete oxygen in the water or produce toxins.

Costs

EUR 27305 EN

European Commission

Science for Environm

Harmful algal blooms in Europe w under climate change

Harmful algal blooms may become more common in n waters as a result of climate change, according to a new s predicted that by the end of this century blooms of two group occur over larger areas and for longer periods every year.

Algal blooms occur naturally at certain times of year when these multiply rapidly. However, if algae populations become abnormally large water of oxygen, and some species produce toxins. These harmful bl contaminate seafood and disturb ecosystems. The economic cost of algal Italy and Spain is over €300 million a year.

2014

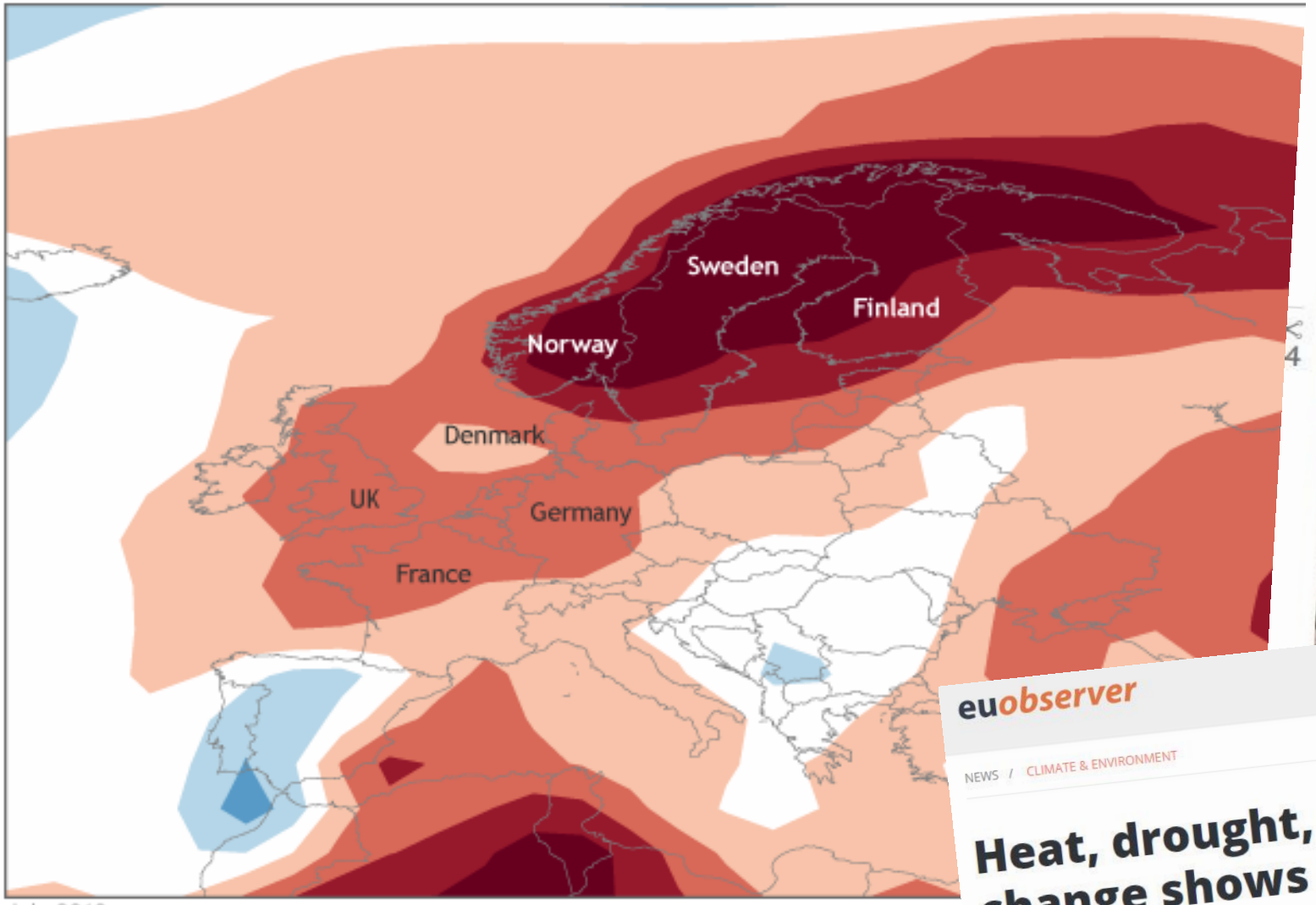
ree

Alert

M., et al.

of

Difference from average surface temperature, July 2018



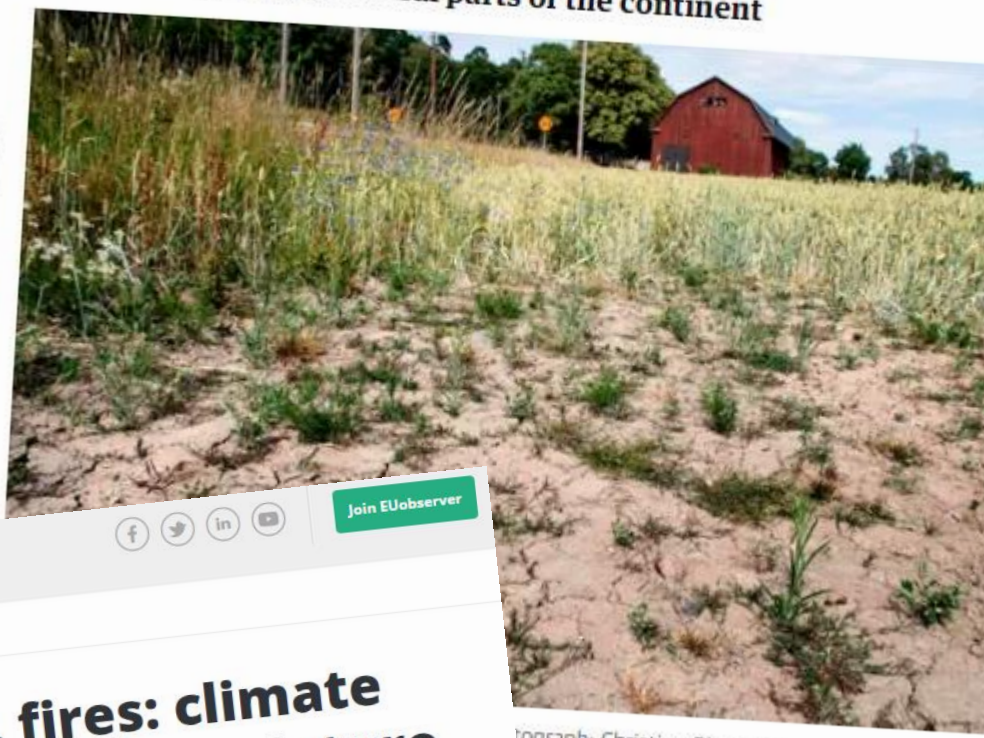
July 2018
compared to 1981–2010

Difference from average (°F)

−7 −5 −3 −1 1 3 5 7+

Crop failure and bankruptcy threa farmers as drought grips Europe

Abnormally hot temperatures continue to wreak devastation across northern and central parts of the continent



tograph: Christine Olsson/AFP/Getty Images

Europe are facing crop failure an
e regional droughts in recent me

euobserver

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NEWS / CLIMATE & ENVIRONMENT

Heat, drought, fires: climate change shows Europe's future

CNN World » U.S. | Africa | Americas | Asia | Australia | China | Europe | Middle East | UK International Edition +

France floods: One missing and 1,600 evacuated

By Eva Tapiero and Judith Vonberg, CNN

Updated 1042 GMT (1842 HKT) August 10, 2018

Europe – Floods in Switzerland, It… Germany After 50mm of Rain in …

13 JUNE, 2018

More storms have hit parts of Europe, caus… of Switzerland, northern Italy and German… died. Meanwhile, storm damage in Austri…

28 JUNE, 2…

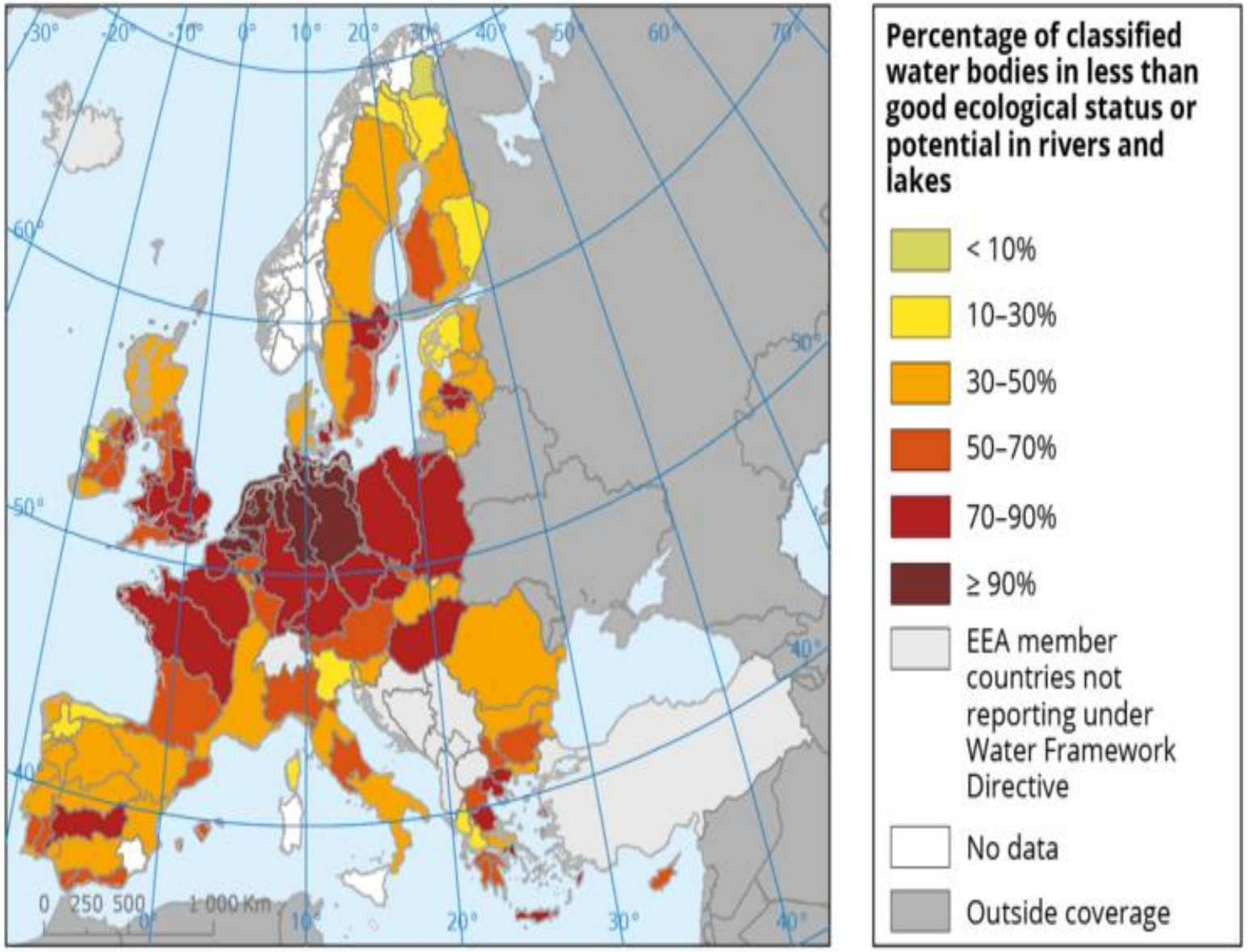
Summer storms ov… central and northern are… local observe…

News & buzz

Election …

European rivers are disfunctional

Map 3.2 Percentage of good ecological status or potential of classified rivers and lakes (top) and coastal and transitional waters (bottom) in Water Framework Directive river basin districts



http://www.eea.europa.eu/soer-2015/synthesis/report

New river regulations in Poland i recent years

New river regulations in Poland i recent years

Wizna,
fot. E. Jabłońska

Struga Franknowo
fot. E. Jabłońska

Piasecznica
fot. J. Bober

Rubieżanka,
fot. E. Jabłońska

Dredging works enhance droughts in situ and floods downstreem and accelerate nutrients transport to sea

Jagodziankia, fot. W. Kotowski

We have dramatically changed the flow of water though landscape

?

THERE IS NO OTHER WAY
for clean water, climate change adaptation and nutrient recycling
THAN RESTORATION

There are many approaches to wetland / river restoration

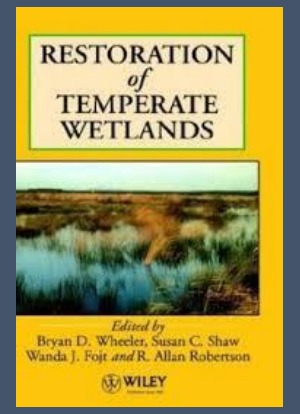
Biodiversity

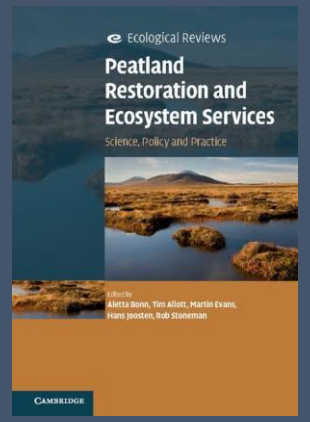
plants	Rewetting, low trophy
birds	Rewetting, food base, open landscape (mowing)
fish	River connectvity, habitat diversity, spawning sites

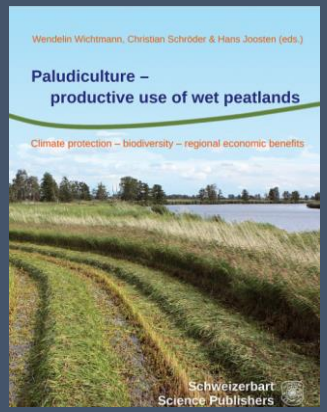
Regulating ecosystem services

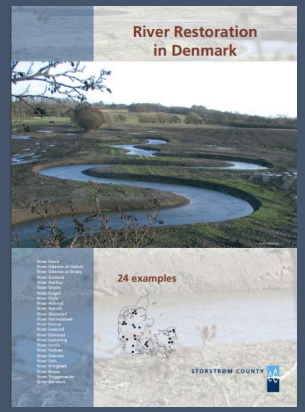
Climate (carbon storage)	Rewetting peatlands, paludiculture
Floods	Upstreem retention, floodplain restoration
Drought	Retention; upstreem wetland restoration
Nutrients	Buffer zones, treetment wetlands, harvesting

synergies









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fot. Monika Szewczyk

By focusing of wetland buffer zones we can gain

- Purification of water
- Water retention, enhancement of local water cycling
- Conservation of organic carbon, climate change adaptation and mitigation
- Fish spawning sites, bird refuges, habitats of invertebrates
- Biomass as source of energy, fodder, materials or green fertilisers

CirculAr Economy Approach
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with use of Carbon-storing Ecosystems

ERANET Project 2017-2020

WP1. Upland sources recharging WBZ

- Objective: **To build a tool and framework for identification of spatially explicit nutrient input hotspots toward existing and projected WBZ.**

Lead:

IGB – Dominik Zak

(with involvement of

SGGW, UW and UN)

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WP2. Wetlands as buffers

- Objective: **To establish methods of quantifying nutrient capture in WBZ and apply them to case catchments.**

Lead:

AU – Carlos C. Hoffmann

(with SGGW)

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WP3. Closing the loop: biomass use, nutrient removal & commodification of nutrient recycling

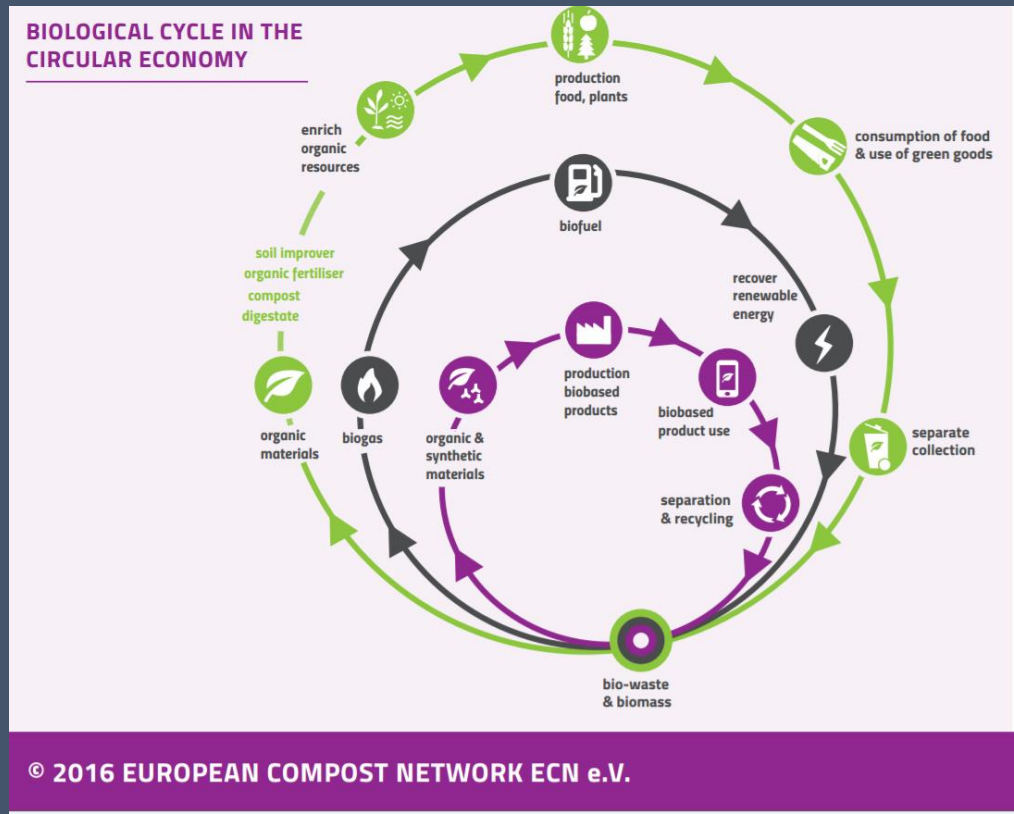
- Objective: **To analyse options of combining nutrient removal including nutrient recycling (ashes, substrates) potential and biomass utilisation.**

Lead

UG – Wendelin Wichtmann, Claudia Oemke

(in collaboration with

GMG and UN)

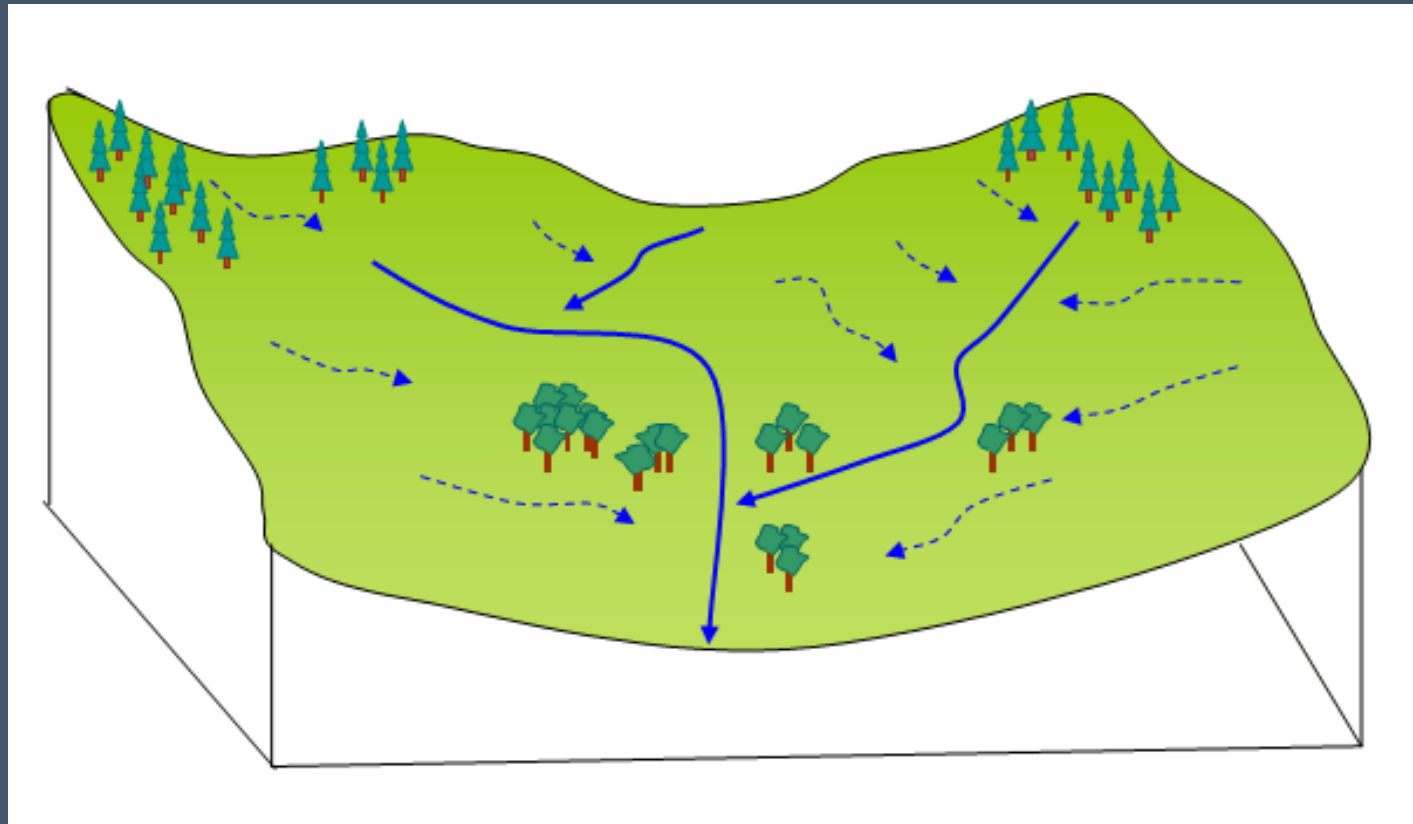


WP4. Water cycles and hydrological boundary conditions

- Objective: **To localize & delimit WBZ & quantify available water in case catchments; assess hydrological co-benefits?**

Lead

SGGW – Mateusz Grygoruk



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WP5. Co-benefits: evaluation of ecosystem services

- Objective: **To estimate cultural services and pure non-use values related to different WBZ scenarios**

Lead:

UW – Marek Giergiczny

UK – Michael Trepel

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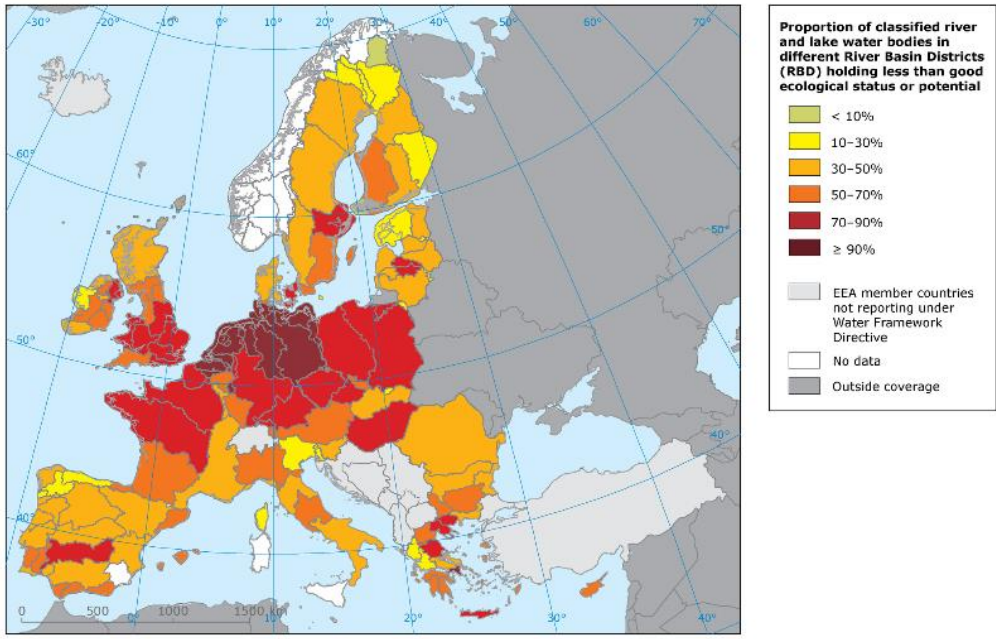
WP6. Policy and civil society

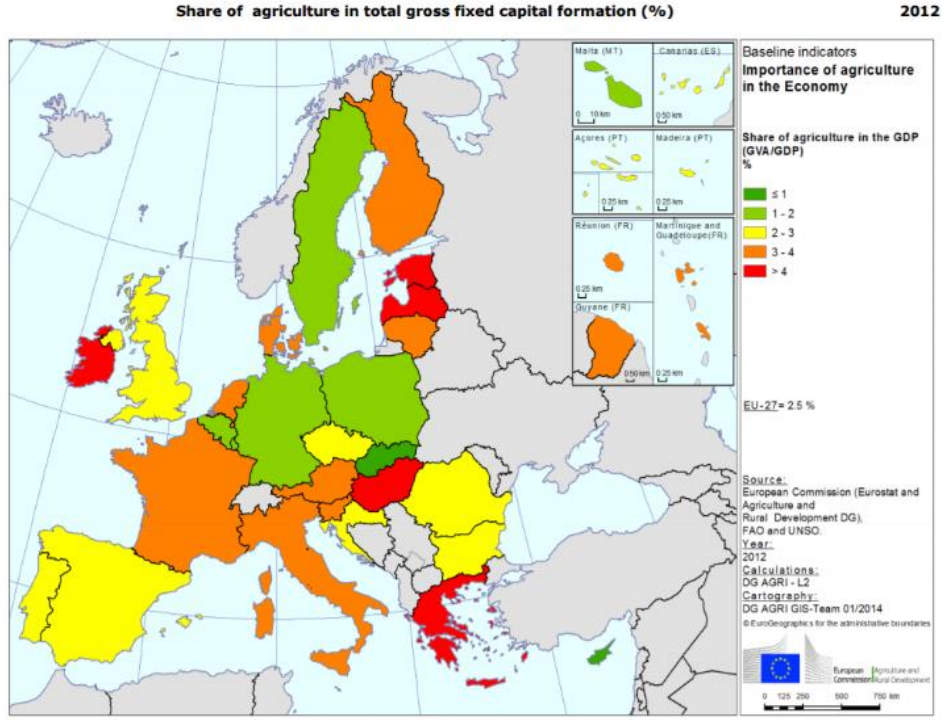
- Objective: **To identify policy and social constraits and opportunities of implementing WBZ.**

Lead:

UG – Rafael Ziegler

Gruene Liga – Michael Bender



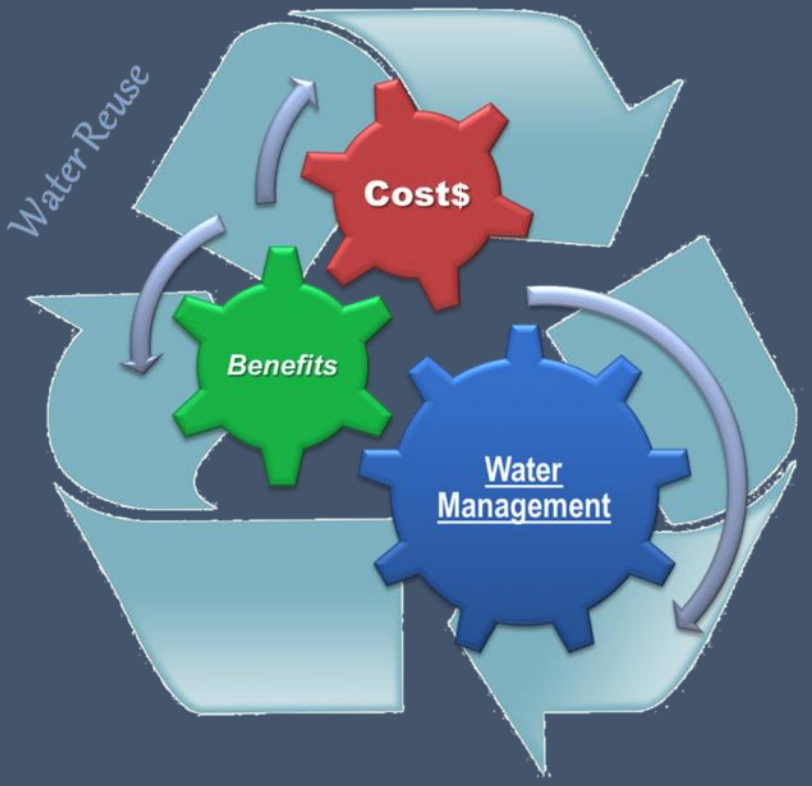


WP7. Integration & upscaling

- Objective: **Costs and benefits analysis on the catchment scale.**

Lead

UW – Majka Wiśniewska
(contribution - all partners)



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„From our observations it was clear that artificial river is a dangerous river. Whereas the infrustrucure that was supposed to protect us did not help, it actually damaged homes of organisms living near the river.

Rivers, which have been changed into artificial canals, must be returned to the natural state, at least to some extent…”

Jarek Brodecki, Łódź

THERE IS NO OTHER WAY