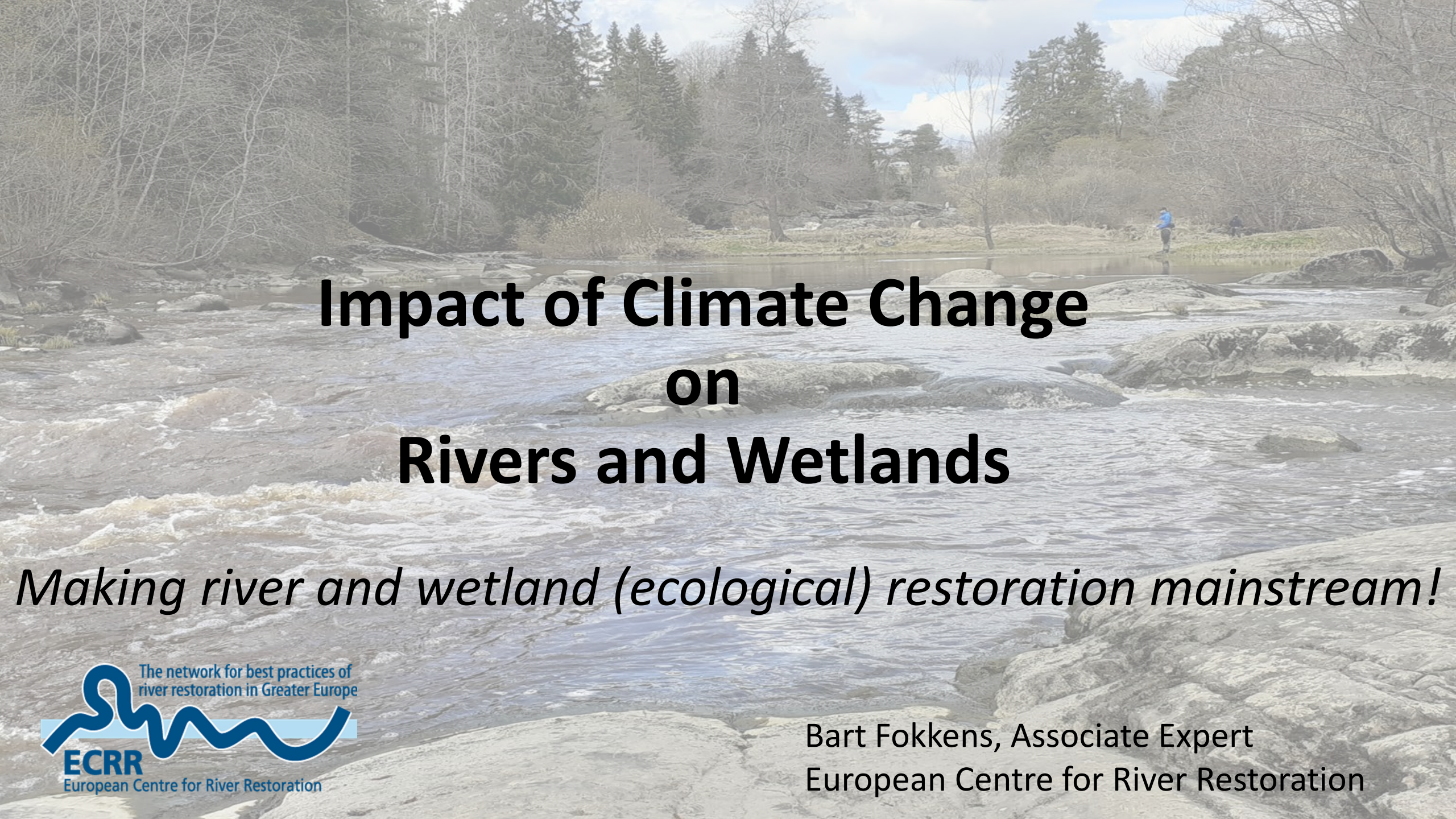


Impact of Climate Change on Rivers and Wetlands

Making river and wetland (ecological) restoration mainstream!

The network for best practices of river restoration in Greater Europe

ECRR
European Centre for River Restoration

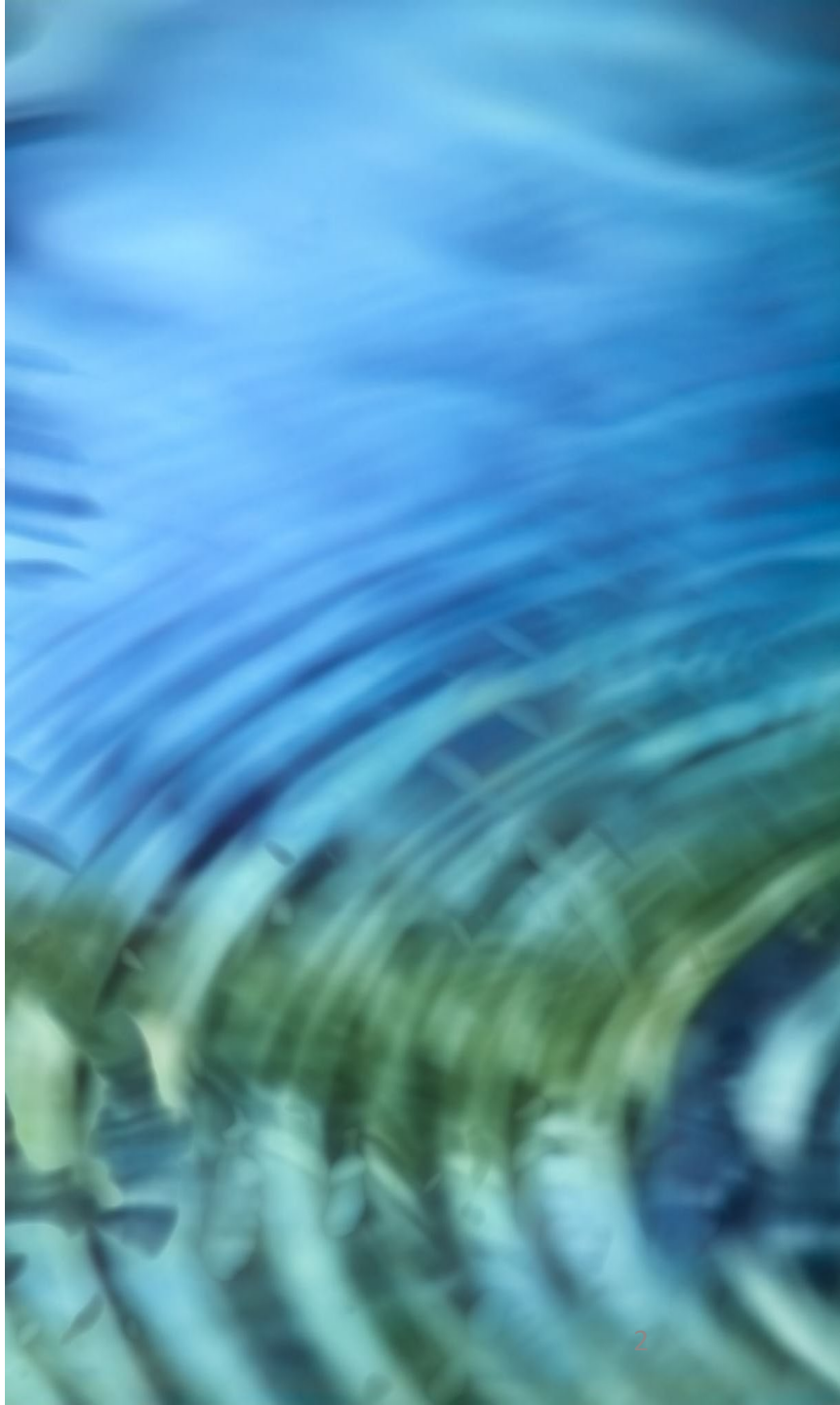
Bart Fokkens, Associate Expert
European Centre for River Restoration

Climate change impacts

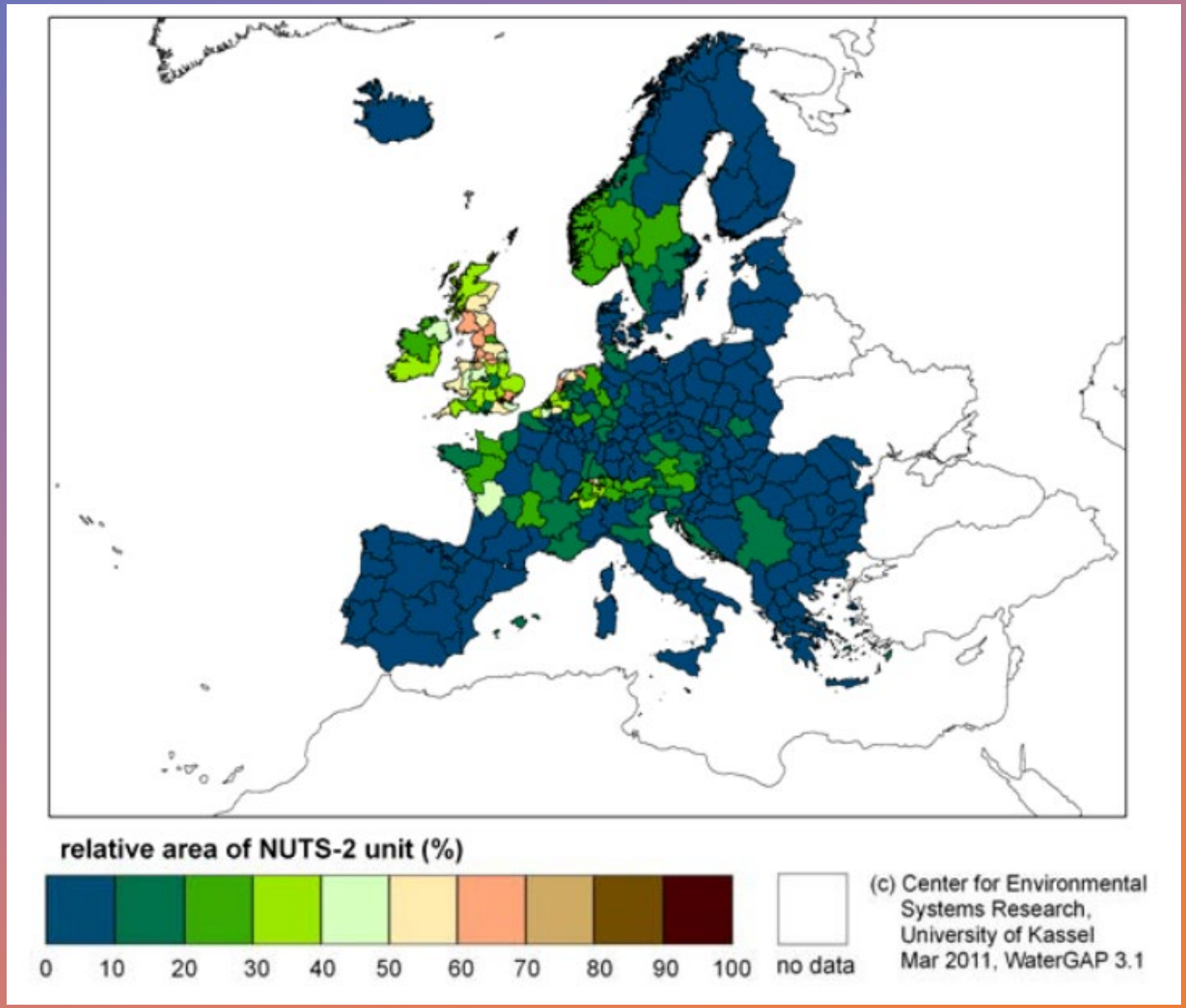
- Water availability
- Water scarcity; natural and human induced
- Water stress; Exstraction
- Cross sectoral competition for water resources
- Floods
- Rising water temperatures
- Deteriorating water quality
- Loss of biodiversity

Conceptual model impacts

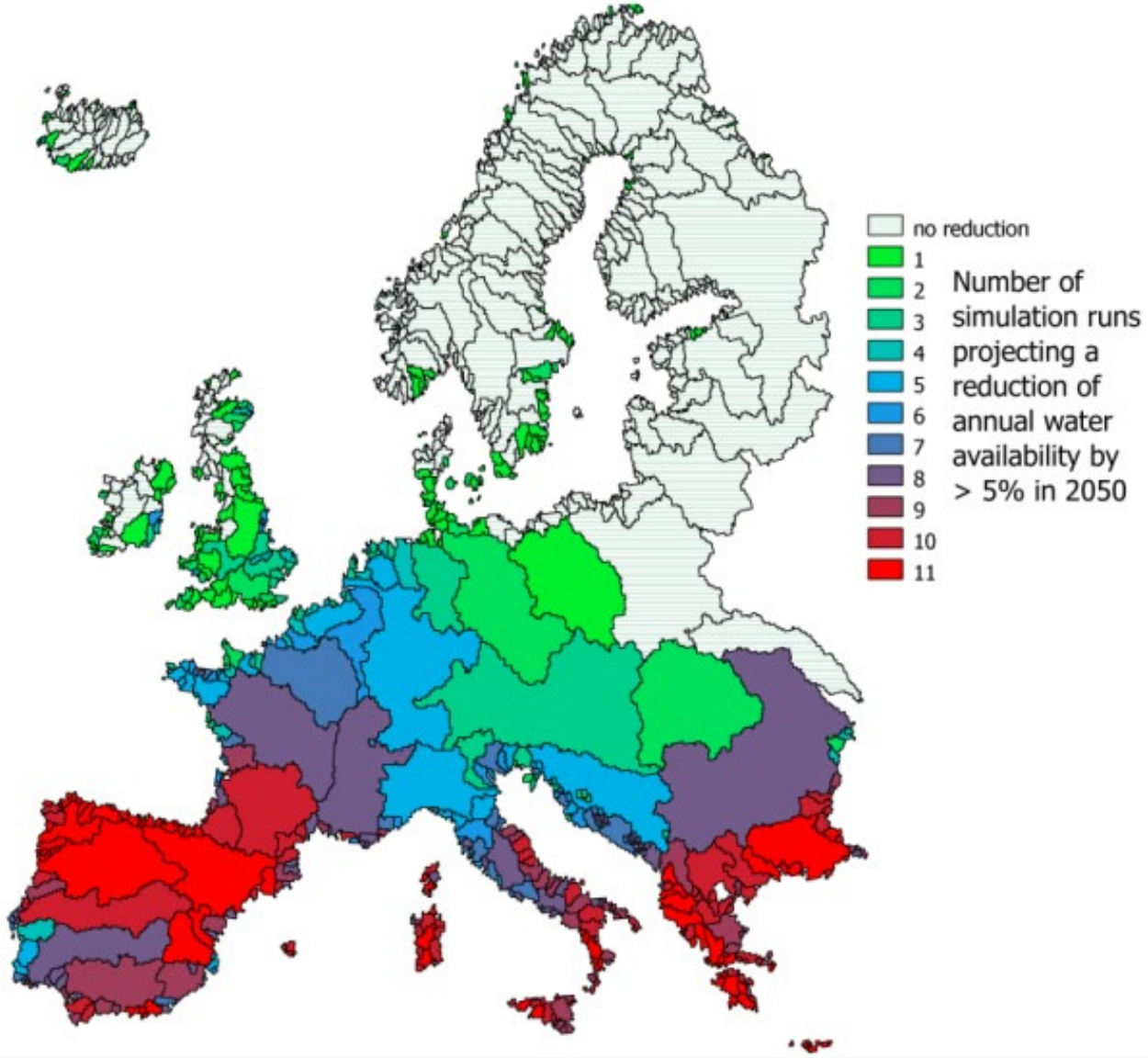
- Vulnerability
- Adaptation



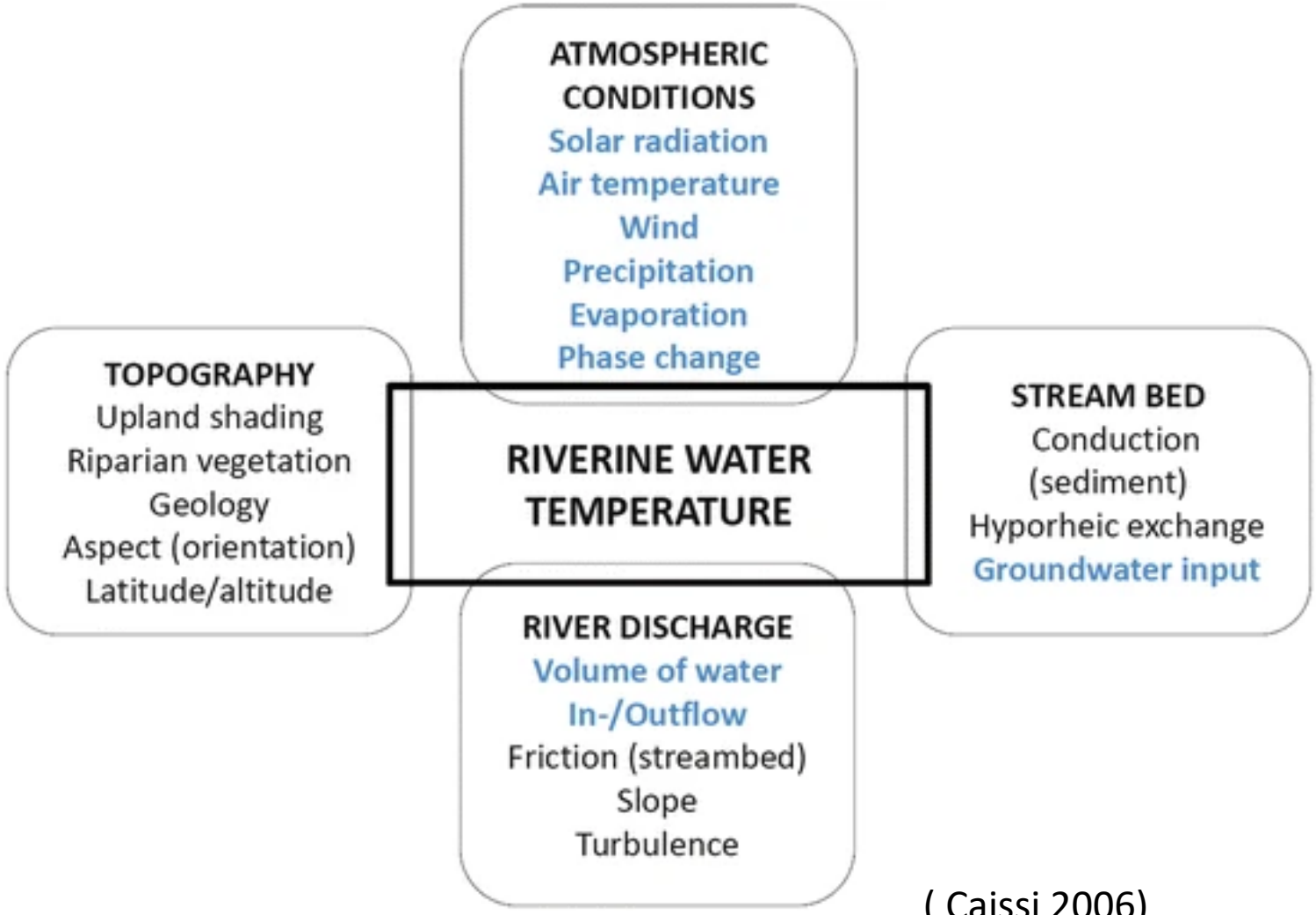
Relative increase of area affected by 100 - year floods in 2050



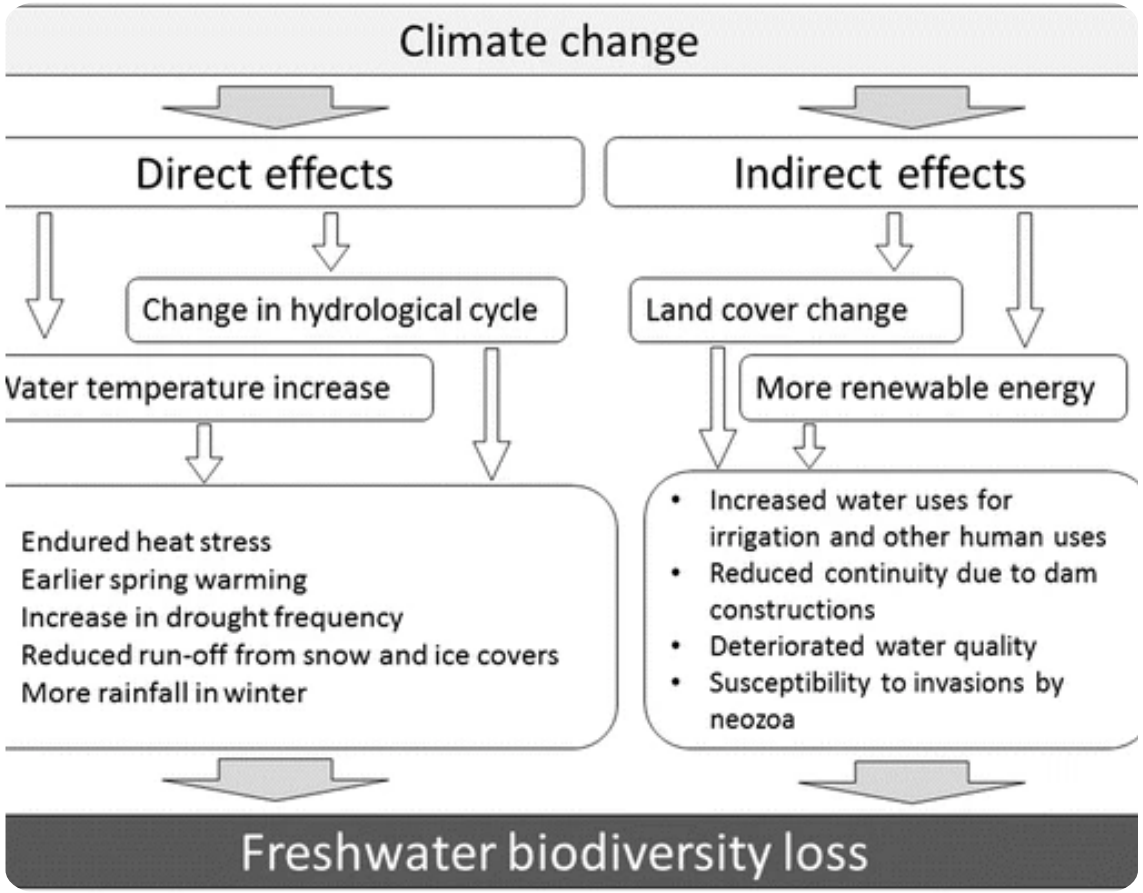
Direction of change in the annual average water availability on a river basin scale



Water Temperature is one of the master variables that requires attention



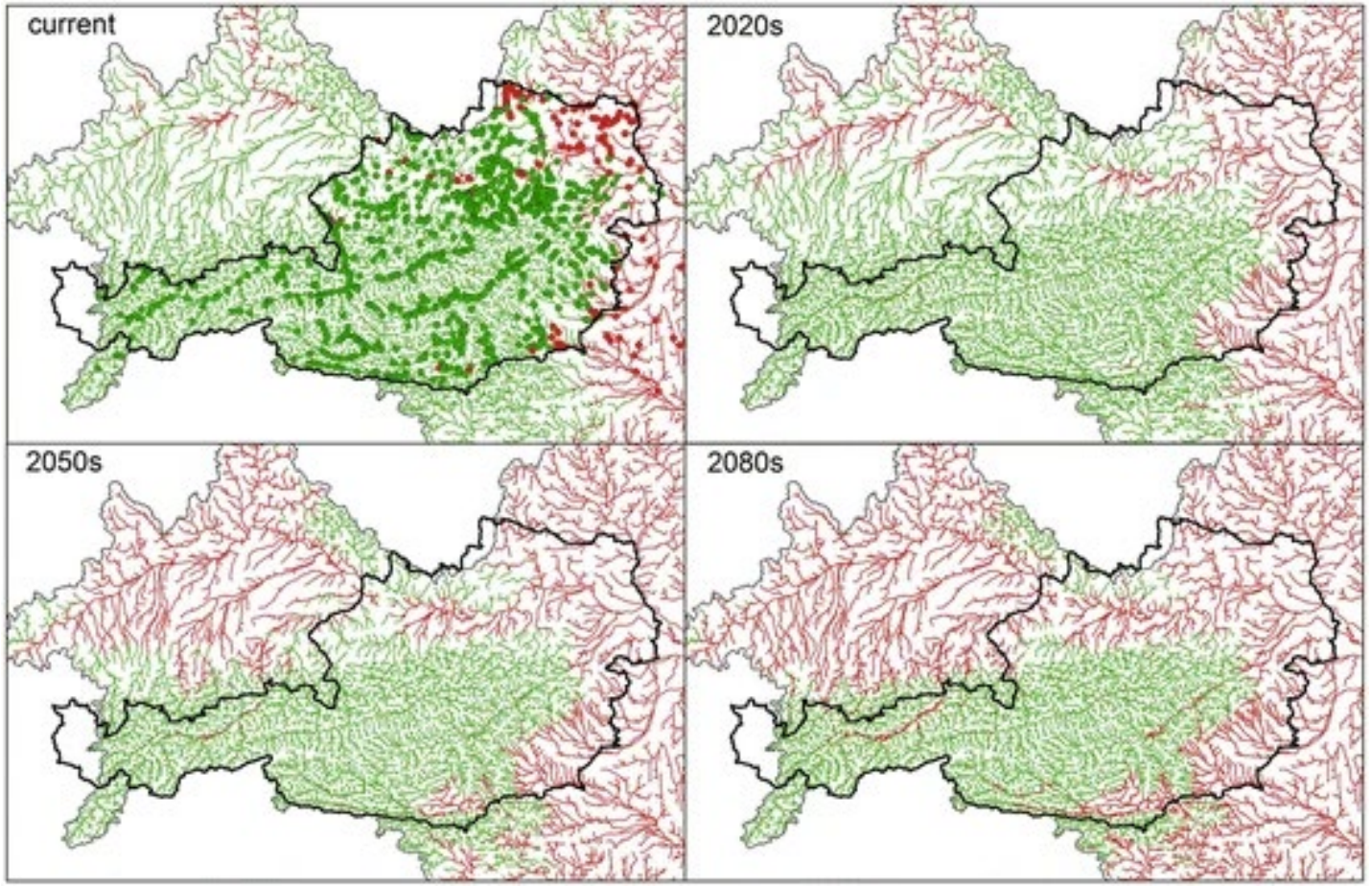
(Caissi 2006)



Interaction of natural processes and human (re)actions

(Fenoglio et al. 2006)

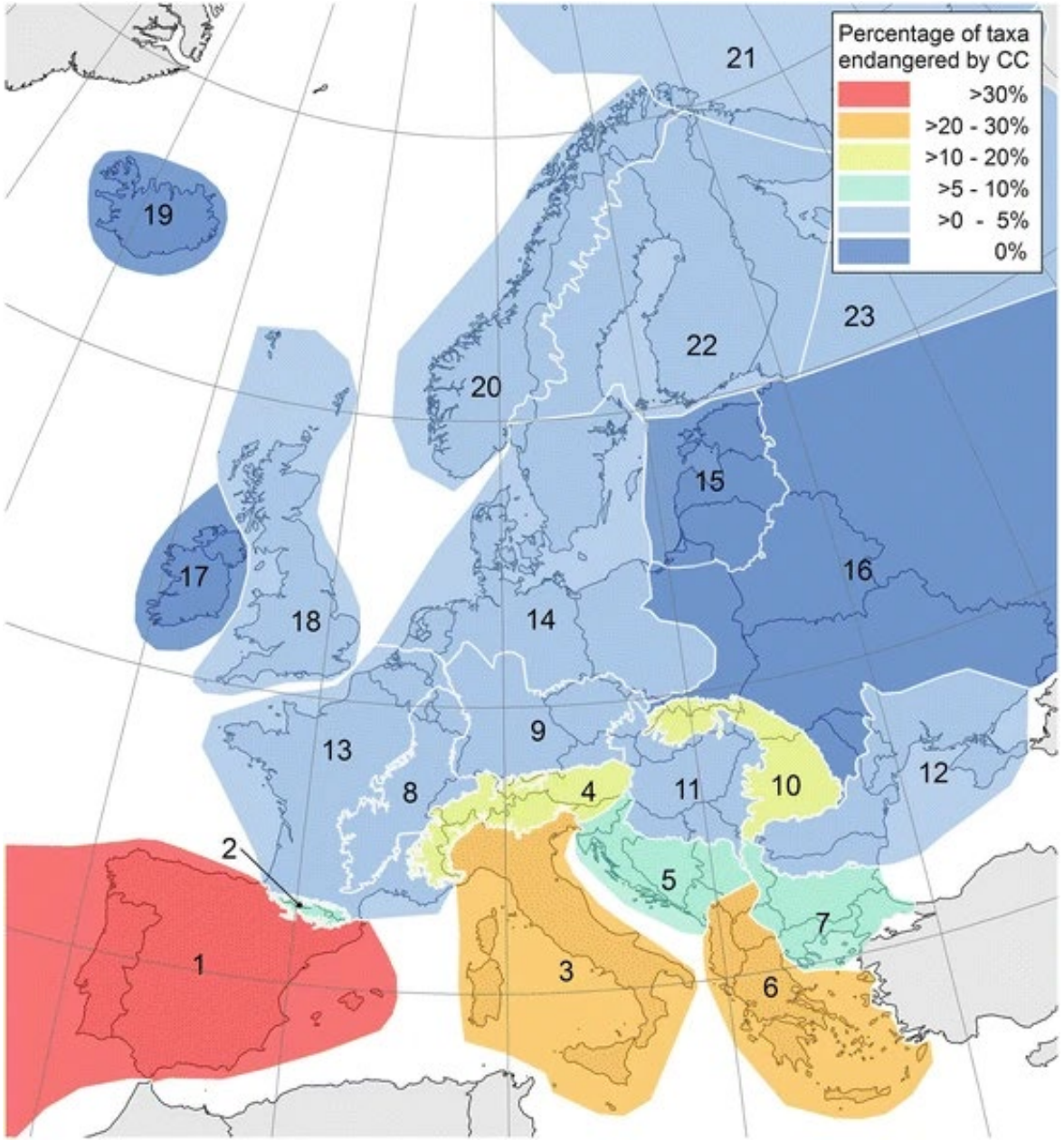
Change of trout (*Salmo trutta*) distribution in in the upper Danube Basin (Austria).



(Filipe et al. 2013)

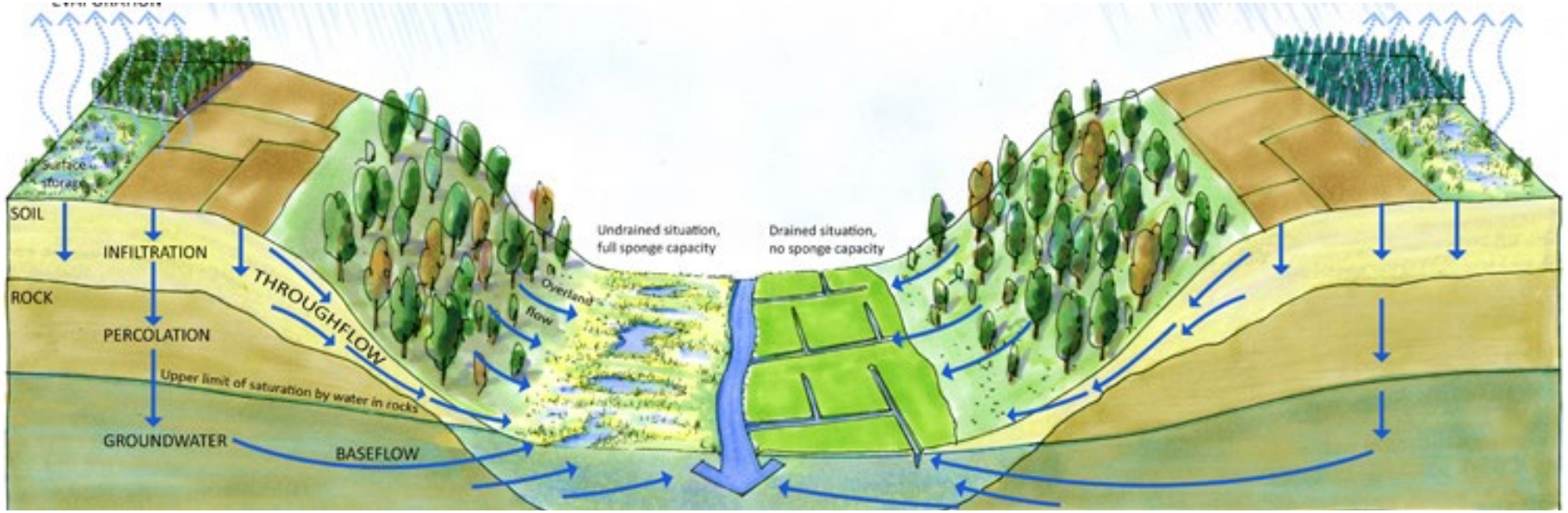
Fraction of Trichoptera taxa potentially endangered by climate change in the European ecoregions

(Hering et al. 2009)



EU CLIMATE RESILIENCE WATER MANAGEMENT

- Thematic water (resources) plans and mechanisms (permits)
- Reduce water use and increase water efficiency and savings
- Stable and secure supply of drinking water (risk analyses)
- **Sustainable soil management and land-use**
- **Natural Water Retention Measures: WWRM**
- **Nature-based solutions to achieve WFD goals: NBS**
- Towards an EU Zero pollution Plan for Air, Water and Soil
- Citizens' and stakeholders' engagement



Adapting rivers to climate change -> integrated approach

- Enhancement of resilience -> freshwater ecosystem restoration
- Restore connectivity –> reduce fragmentation
- Conserve freshwater habitats –> water retention measures (NWRM)
- Include flood protection – nature-based solutions
- Adequate and robust management strategies-> WFD objectives 2027

EU policies call for greater nature/river restoration efforts

Calls for restoring **25 000 km** of EU rivers to a free-flowing state

→ **remove (primarily obsolete) barriers to longitudinal and lateral connectivity,**

→ Inventerise barriers, conduct necessary research and quantify the area that needs to be restored,

→ prepare and submit national restoration plans.

→ More attention to hydro-morphology, water flows, sediment and nutrients transport and climate adaptation.


Thank you for your attention!