

11^{de} Waterforum: Waterschaarste en droogte, de nieuwe realiteit

Friday, 26 September 2014

Vulnerability to Drought in Europe

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The EEA

eea.europa.eu

is

- An independent EU agency
- Analysing, assessing and providing information
- An interface between science and policy
- Dependent upon strong networks to carry out its work

Is not

- Formulating or proposing new legislation
- An executive body implementing environmental measures
- A funding body

We are about 200 EEA staff members including national experts

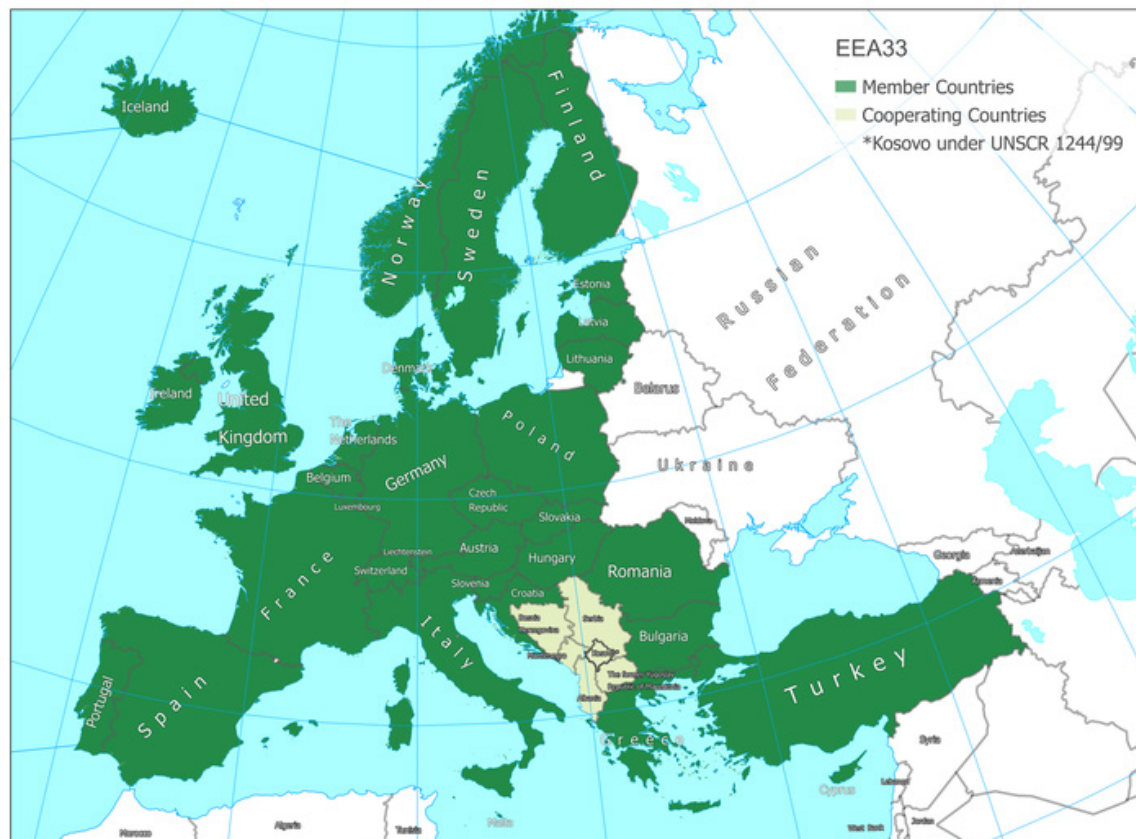


European Environment Agency



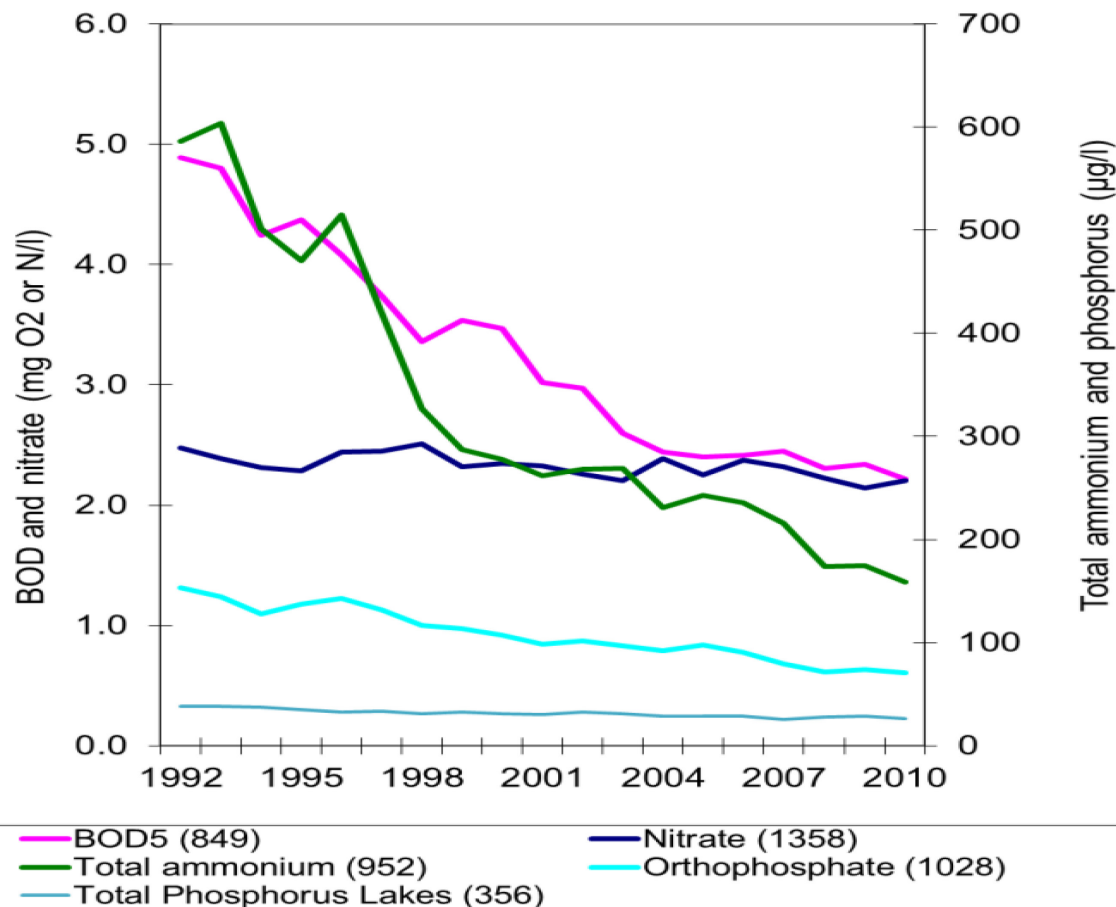
EEA Mission statement

The European Environment Agency aims to support sustainable development and to help achieve **significant and measurable improvement** in Europe's environment through the provision of **timely, targeted, relevant and reliable information** to policy-makers, public institutions and the public.



Water quality is mostly improving...

- Concentration levels of many water pollutants are falling



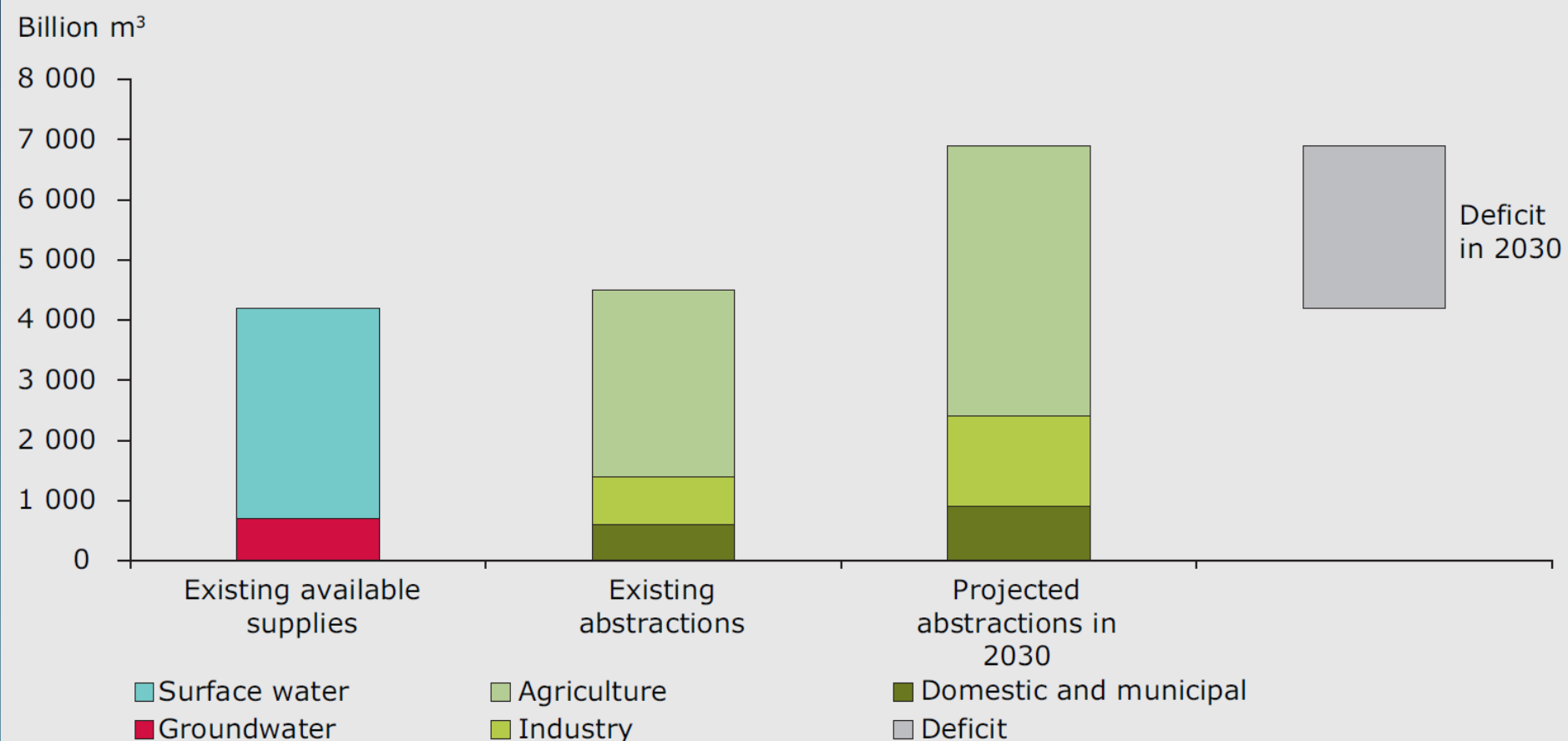
Concentrations of pollutants in water 1992-2010, source: EEA



But what about water quantity?



Global demand for water



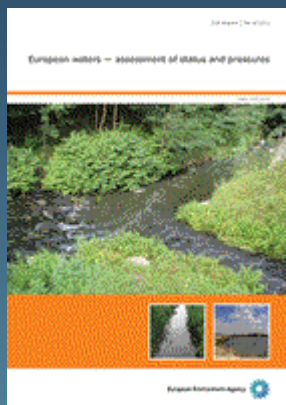
Charting our water future, 2009, 2030 Water Resource Group

European Environment Agency

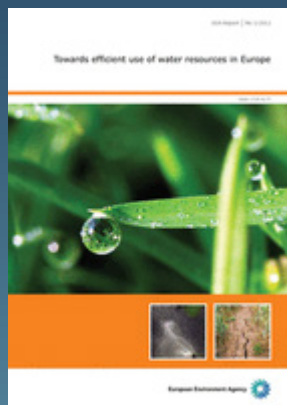


EEA reports support the Commission's 'Blueprint'

Status assessment



Water efficiency



Synthesis on water policies



Water vulnerability



<http://www.eea.europa.eu/themes/water/water-assessments-2012/water-assessments-2012>



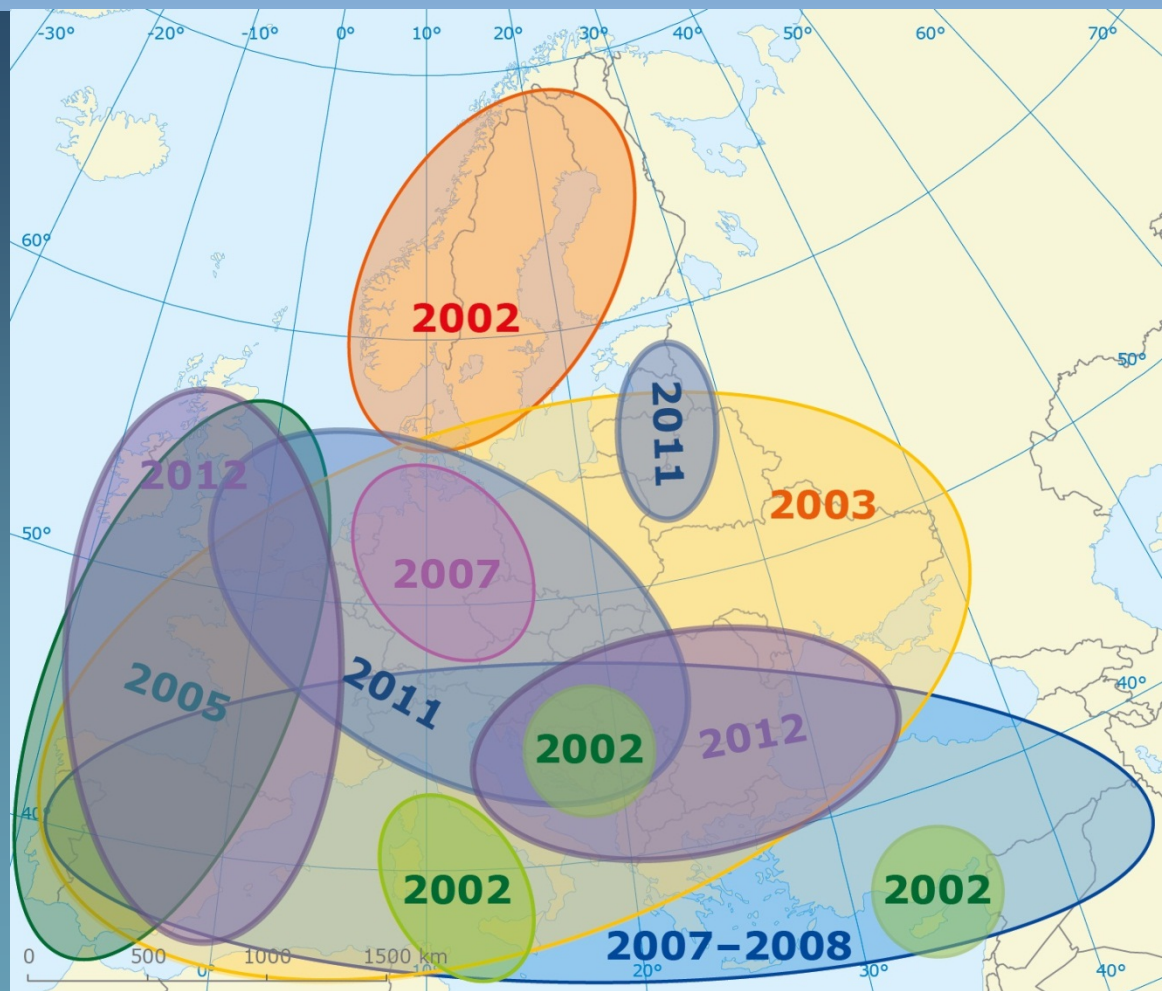
Drought is natural

- Many ecosystems have developed in harmony with seasonal drought



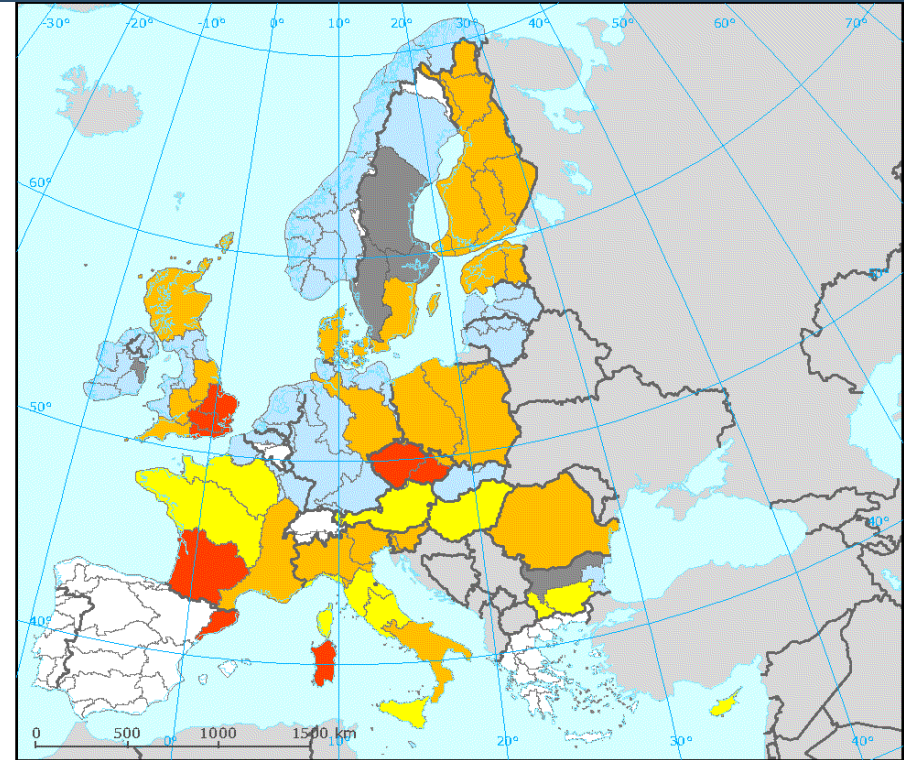
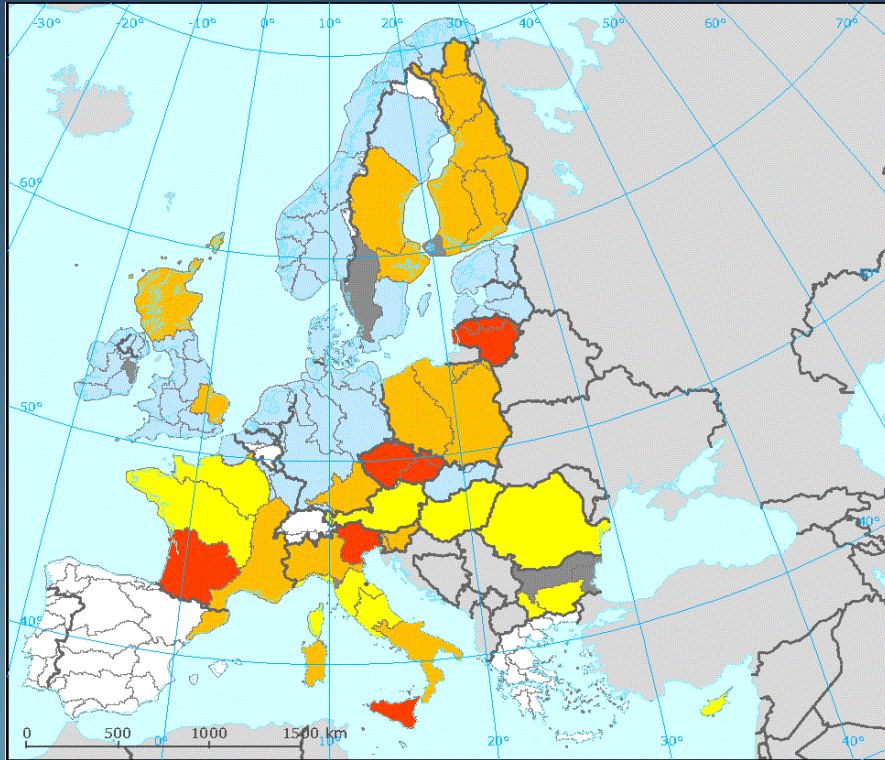
Droughts are not only Mediterranean

- 37% of EU territory and +/- 20% of EU population affected by severe drought over last 25 years

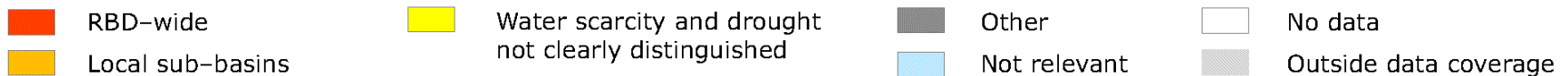


Main drought events in Europe, 2002–2012 source: EEA

Occurrence of droughts and water scarcity in RBMPs



Occurrence of drought (left) and water scarcity (right) in RBMPs

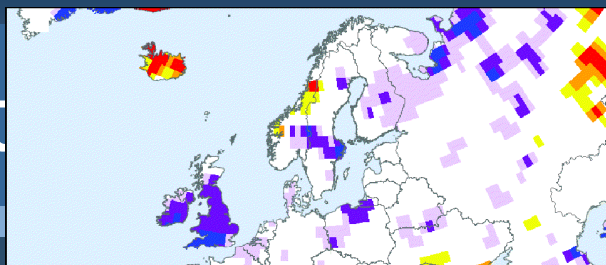


Note: 'Other' also includes the cases where there is no clear information about these issues in the RBMPs.

Schmidt and Benítez, 2012.



Mapping of drought

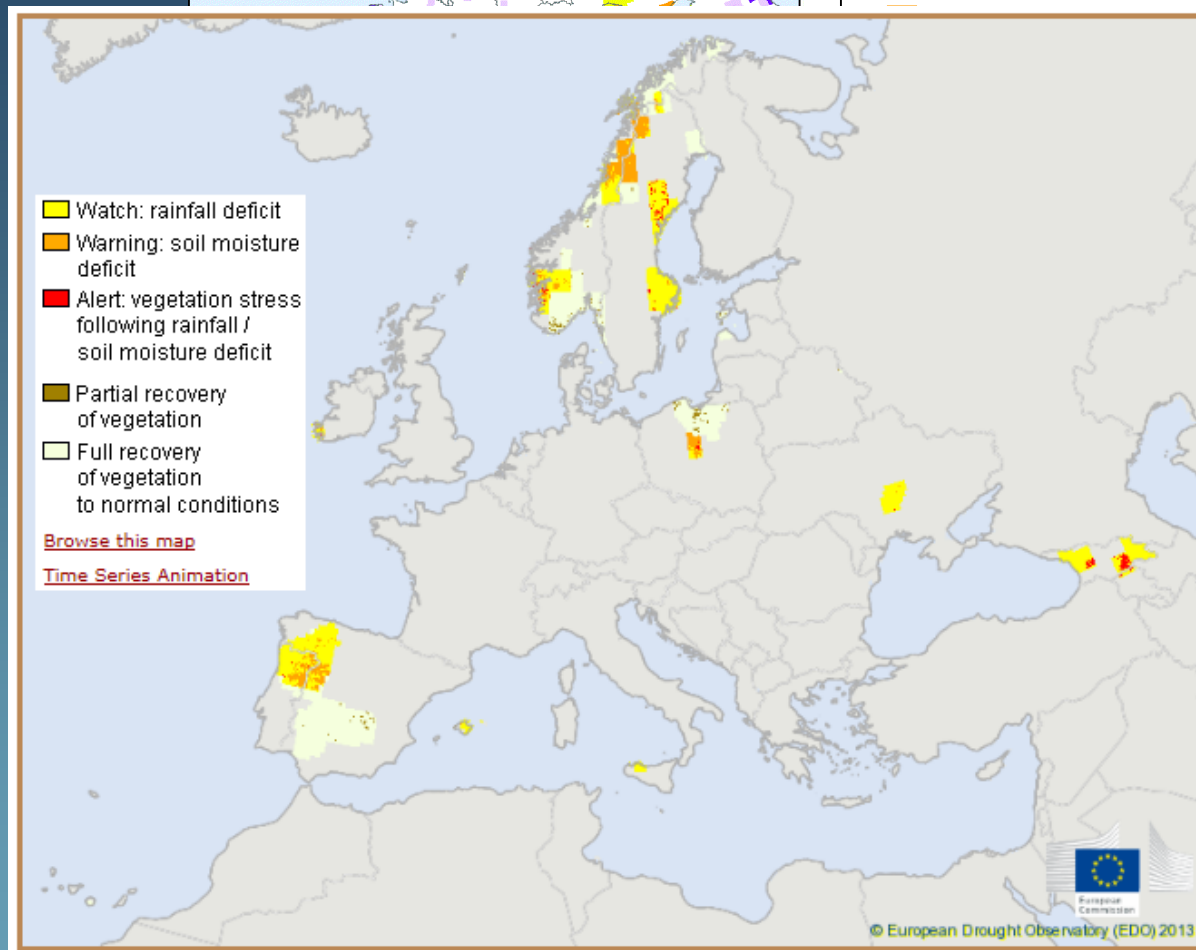


Standard Precipitation Index (SPI-3), Soil Moisture Anomaly and Vegetation Productivity Anomaly (fAPAR Anomaly) for the last 10 days of August 2012

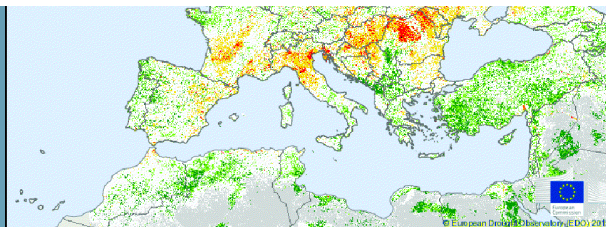
SPI blendet and interpolated

Extreme dry (SPI ≤ -2)

- European Drought Observatory (JRC)
- Based on SPI, soil moisture and vegetation productivity anomaly



<http://edo.jrc.ec.europa.eu>



Land use change makes drought worse

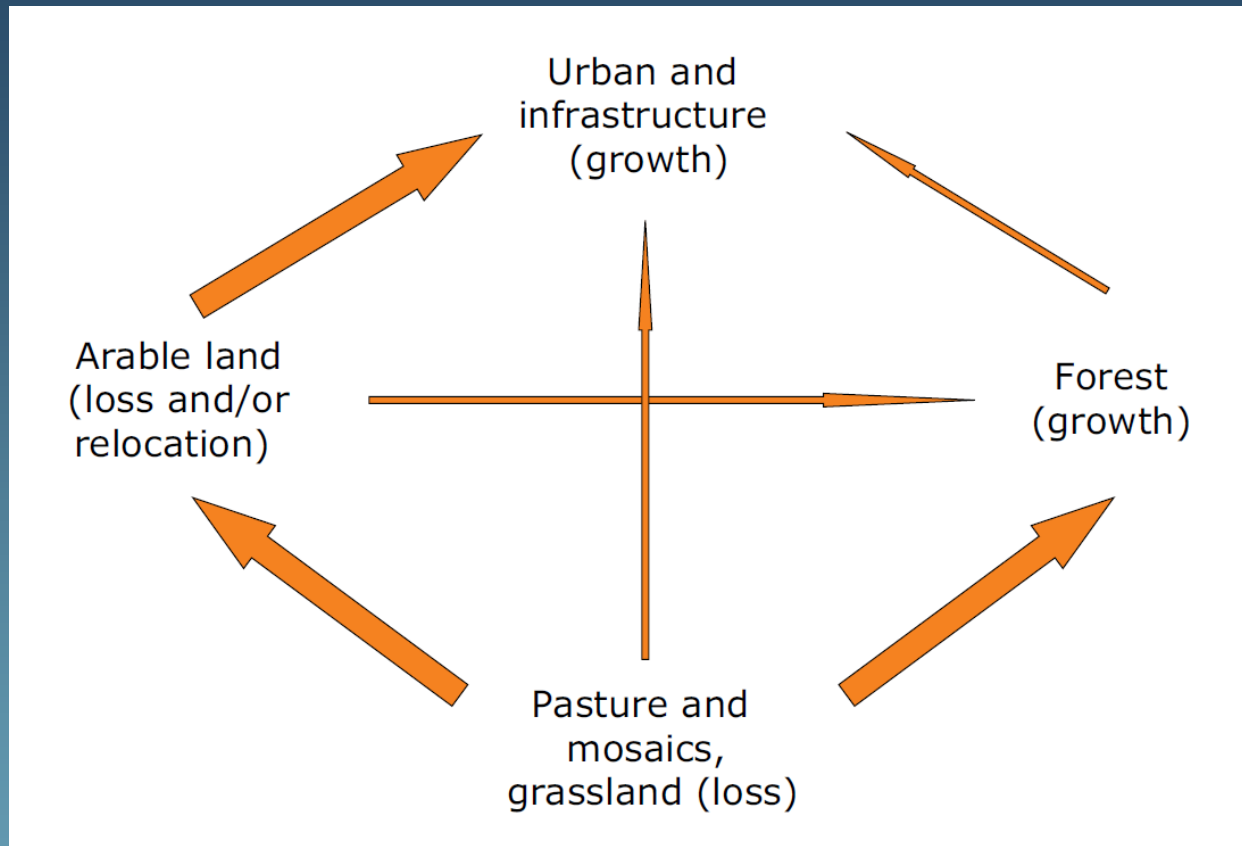
Land use change is primarily caused by economic development and urbanisation





Land use change makes drought worse

Land use change is primarily caused by economic development and urbanisation

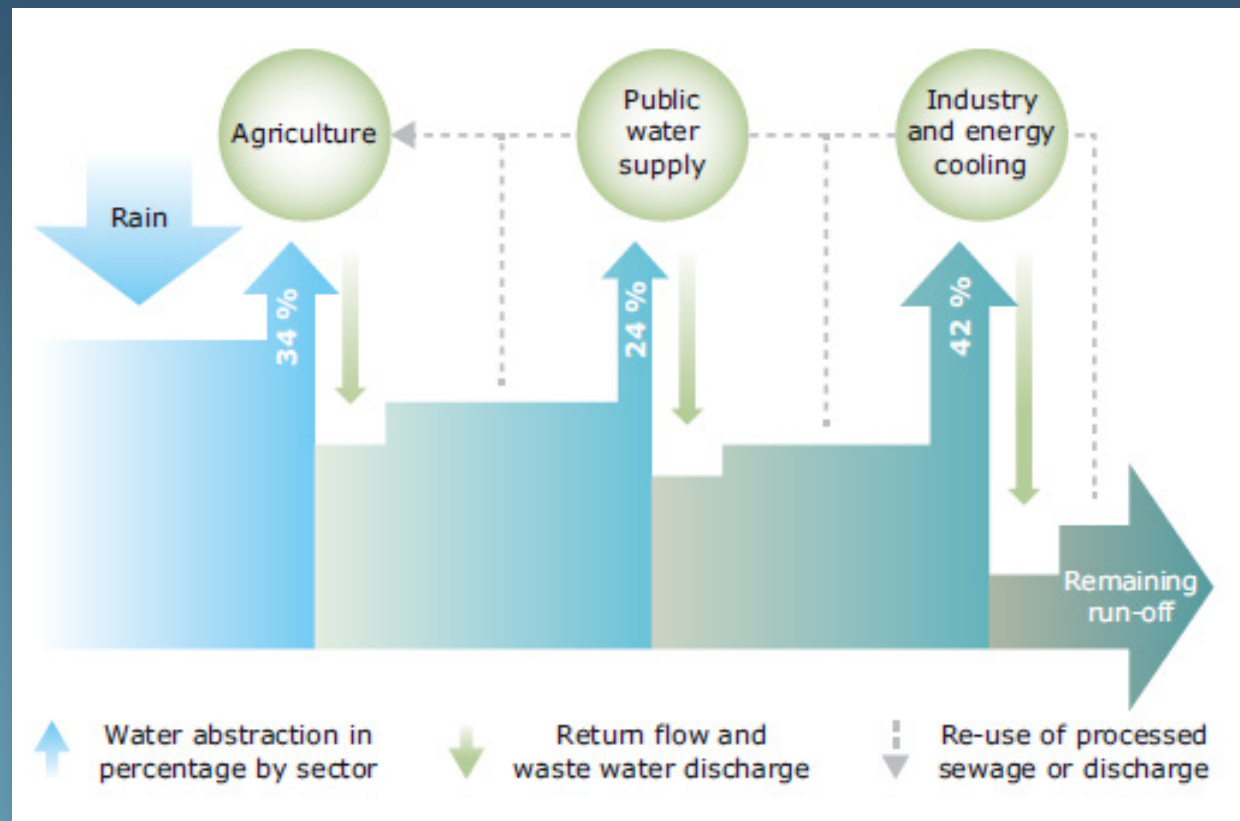


Predominant net land conversions in Europe (1990–2006)
Based on Corine Land Cover Analysis, source: EEA





Water abstraction and return flows



Environmental indicator report 2012, EEA

Over-abstraction increases water scarcity

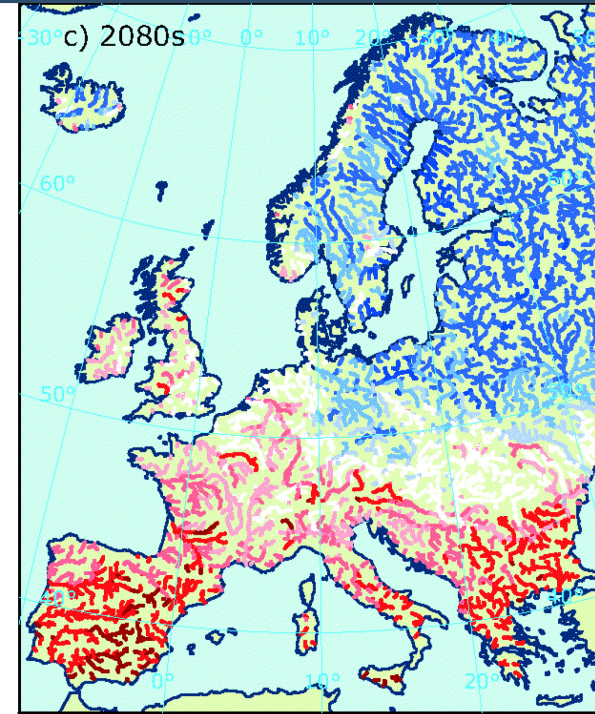
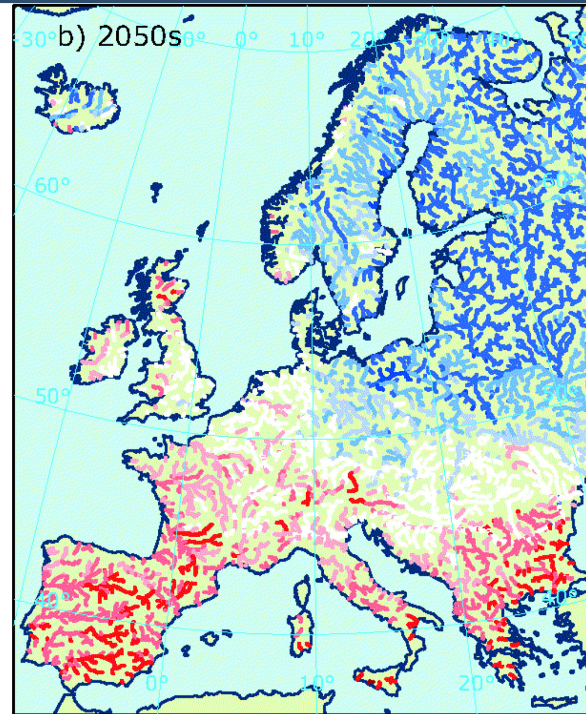
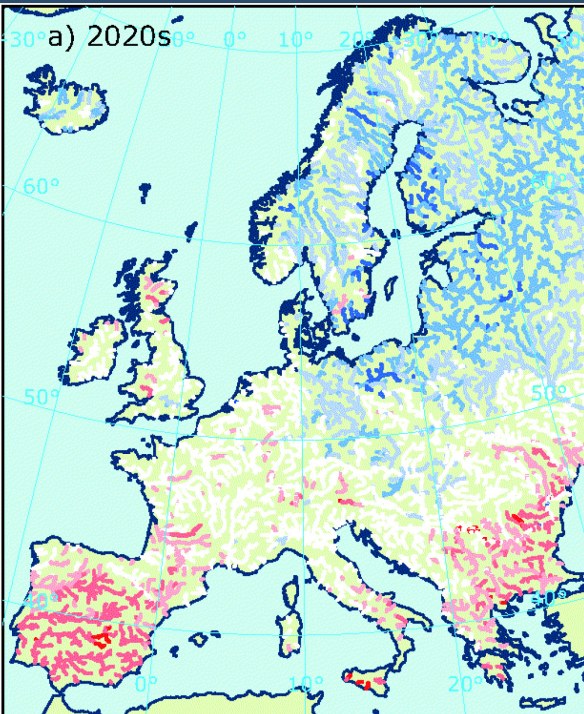
Agriculture accounts for 33 % of fresh water use in Europe. In some regions of southern Europe, it uses up 80 % of all available freshwater.



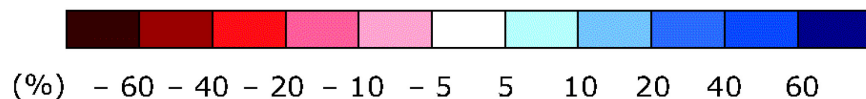
Low prices for agricultural water amount to a subsidy for over-abstraction



The additional pressure of climate change



Relative change in minimum river flow with return period of 20 years between future period and 1961–1990 (SRES A1B)



© 2012 JRC, European Commission

Overcoming water vulnerability

- Agricultural practices can be modified to conserve water
- ‘Green infrastructure’ and Natural Water Retention Measures must be encouraged





Technology & infrastructure play a role



- Technology in the home can save water.
- Drip-irrigation systems are more efficient than conventional irrigation.



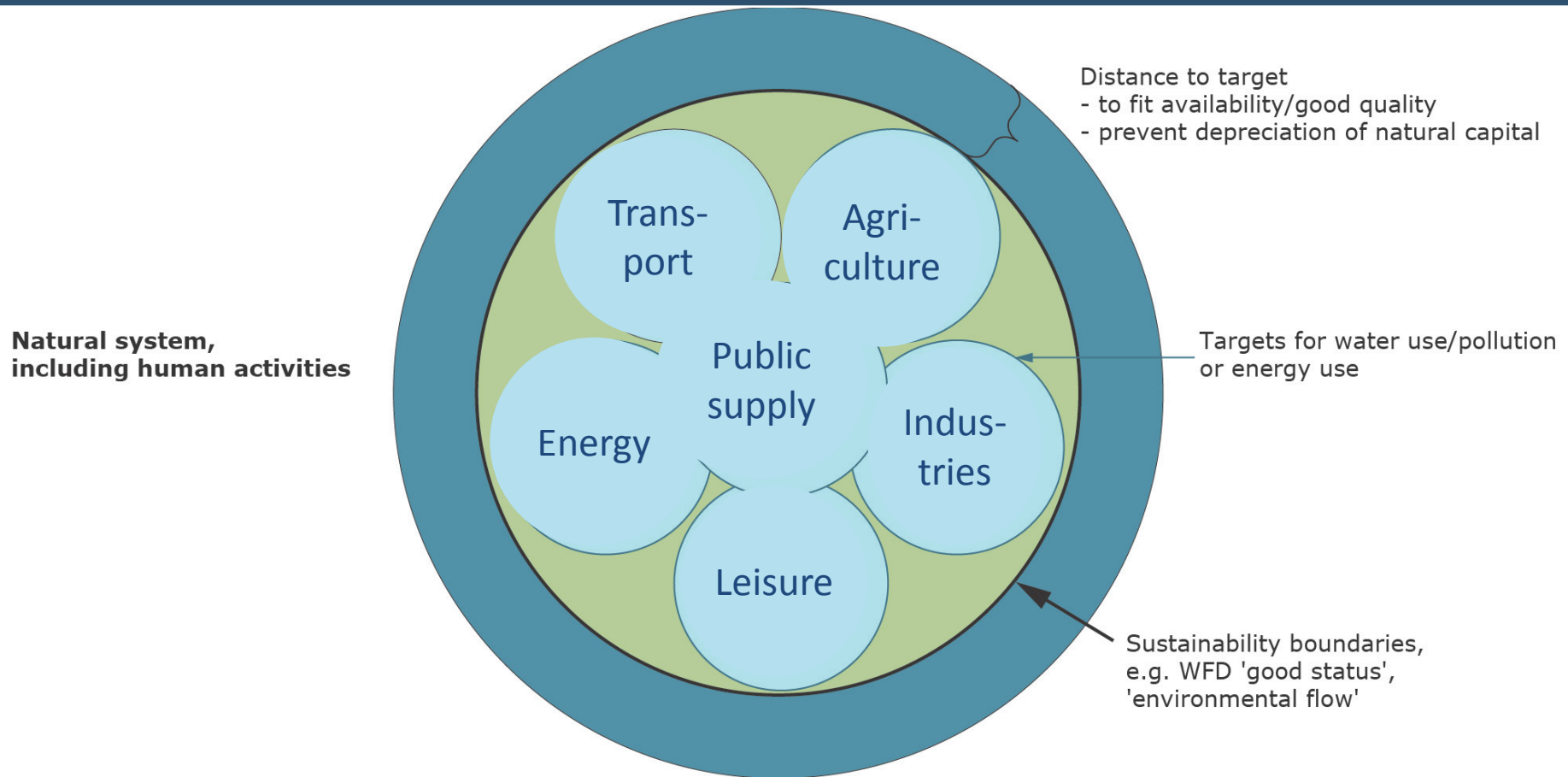
But efficiency is not enough....



- We must beware of the danger of the 'rebound effect', which can negate gains in efficiency
- Economic instruments such as taxes and subsidies are a vital addition to regulation and legislation



Water use within sustainable boundaries



Modified after S. Postel / Natural Resources Forum 27 (2003); 89-98

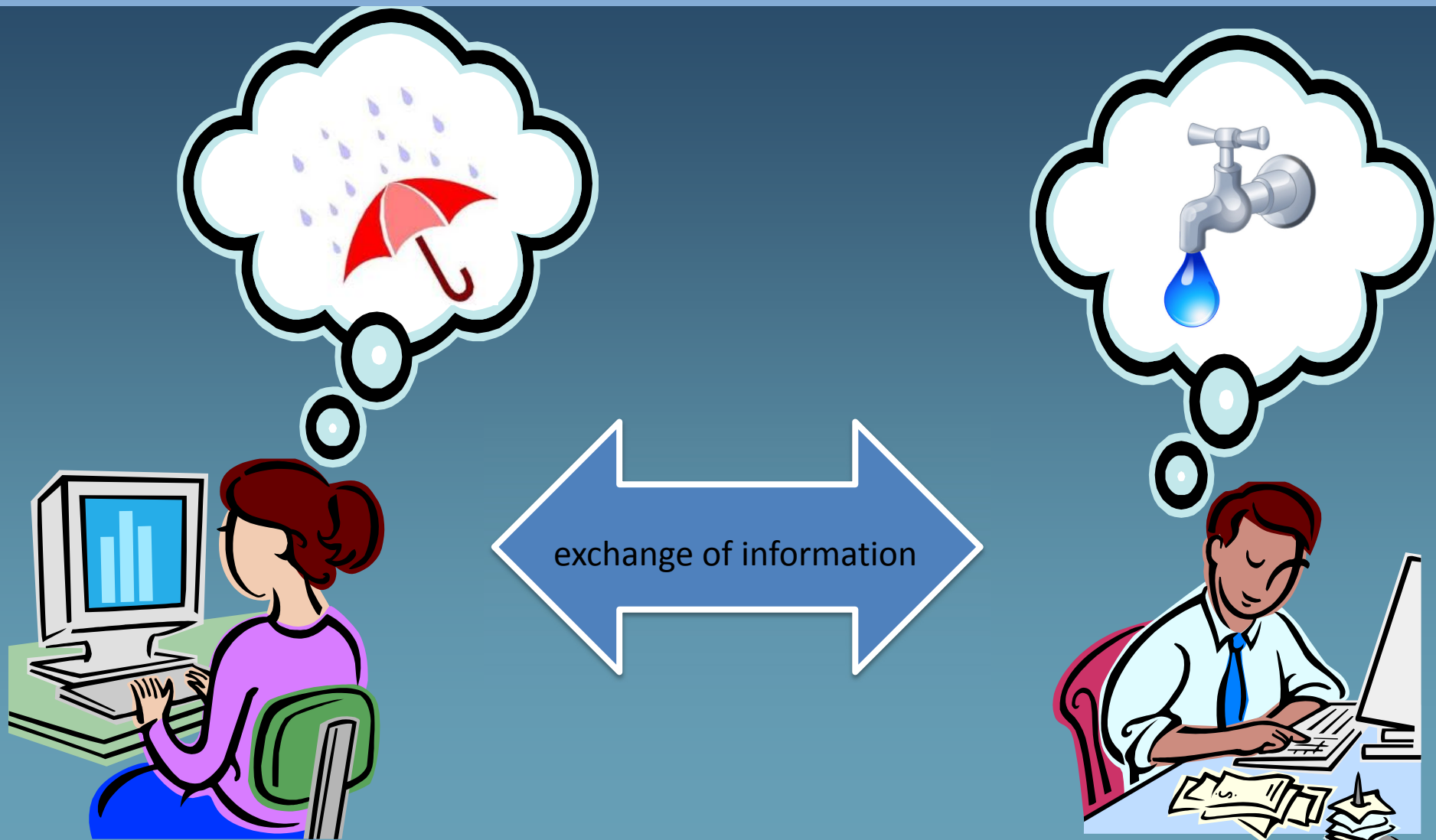
Towards efficient use of water resources in Europe, 2012

European Environment Agency

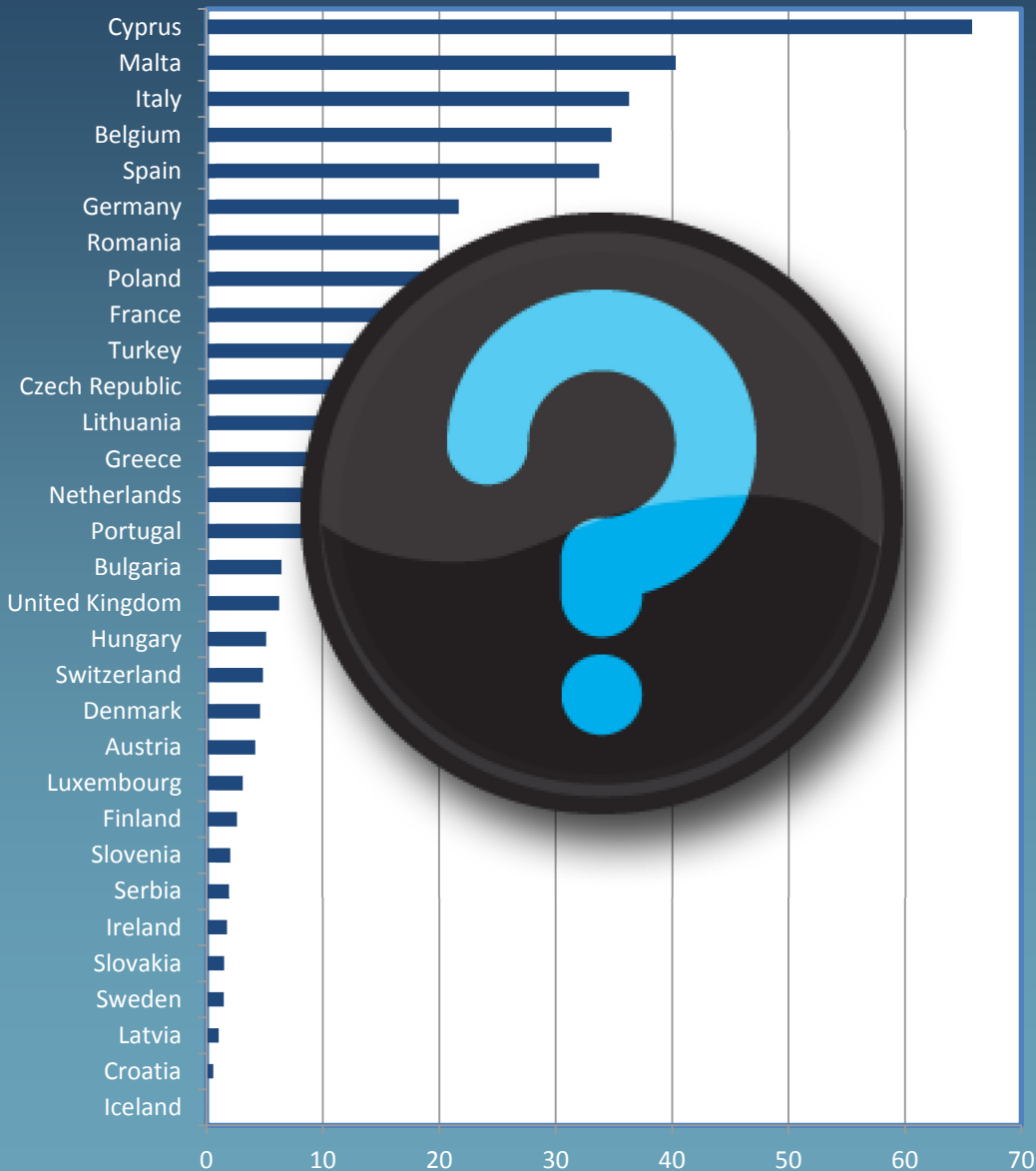




Water accounts are essential



Water exploitation index



■ WEI

EUROSTAT Water Exploitation Index

- National, yearly averaged values
- LTAA 1990-2011



WEI - towards a regionalised approach



Water exploitation index (%)

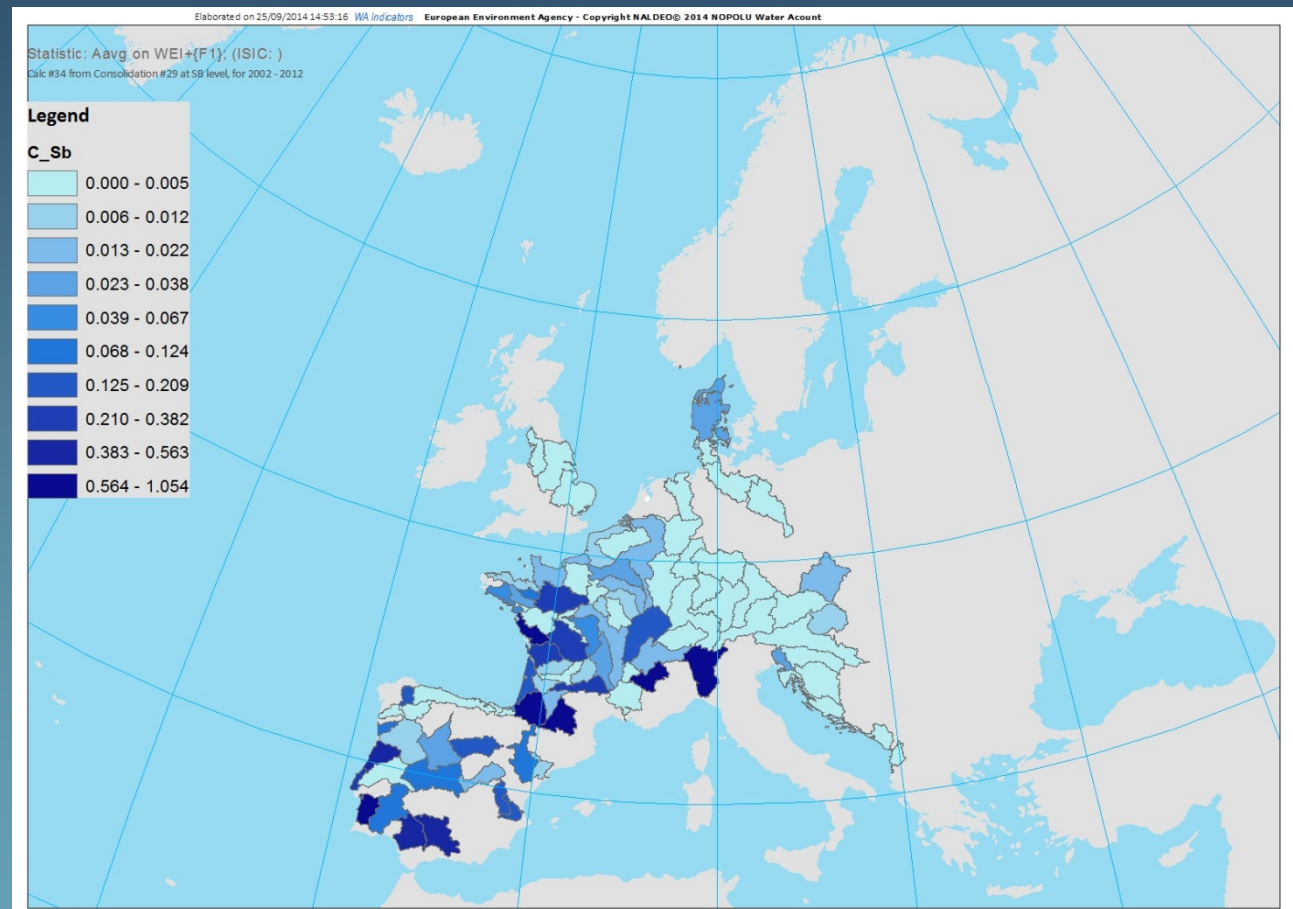


- RBDs instead of administrative (national) boundaries



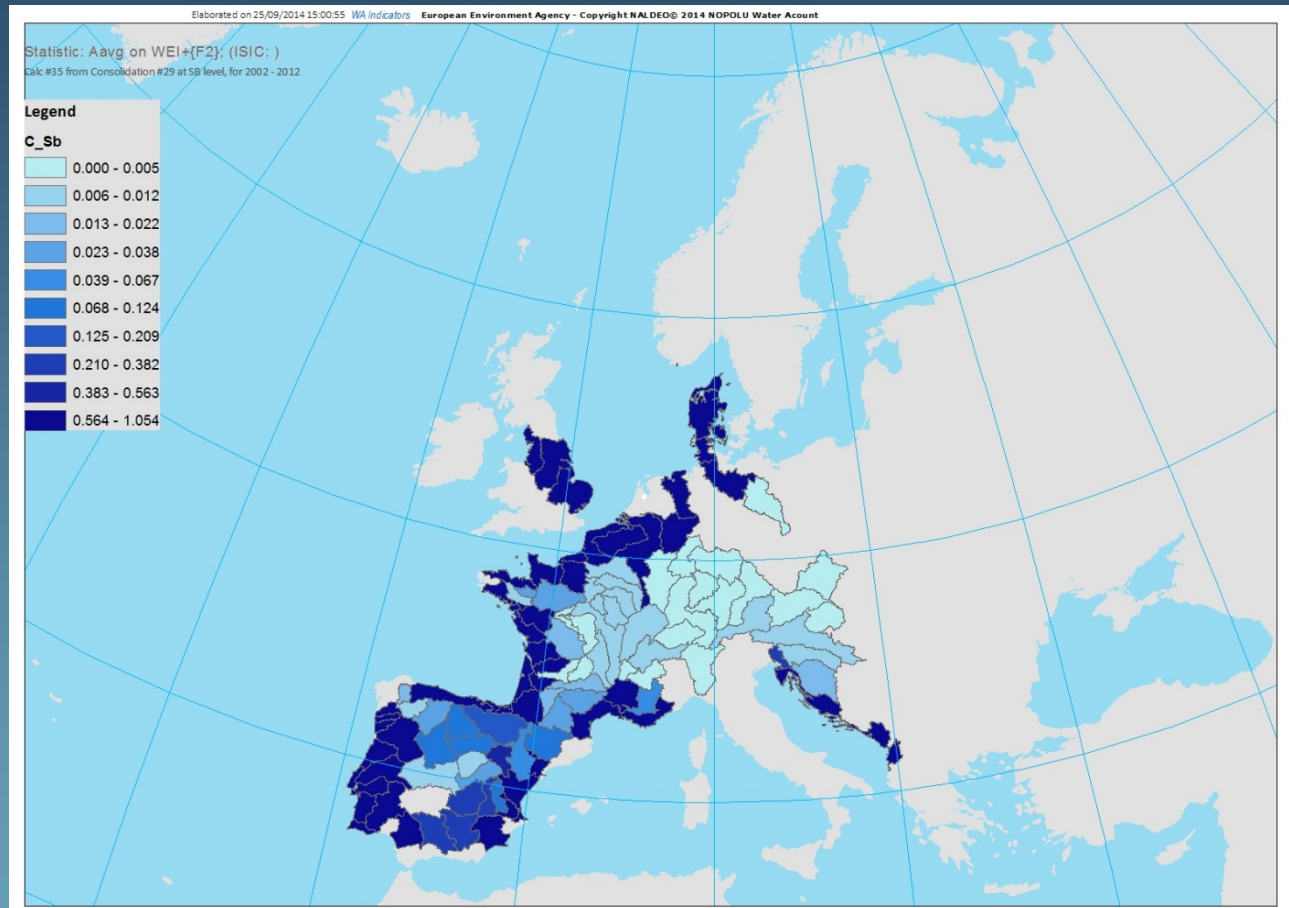
The EEA water accounting methodology

- The EEA is working on a methodology for water accounts in partnership with the Commission and Member States.
- European overview
- Comparable methodologies to compare results

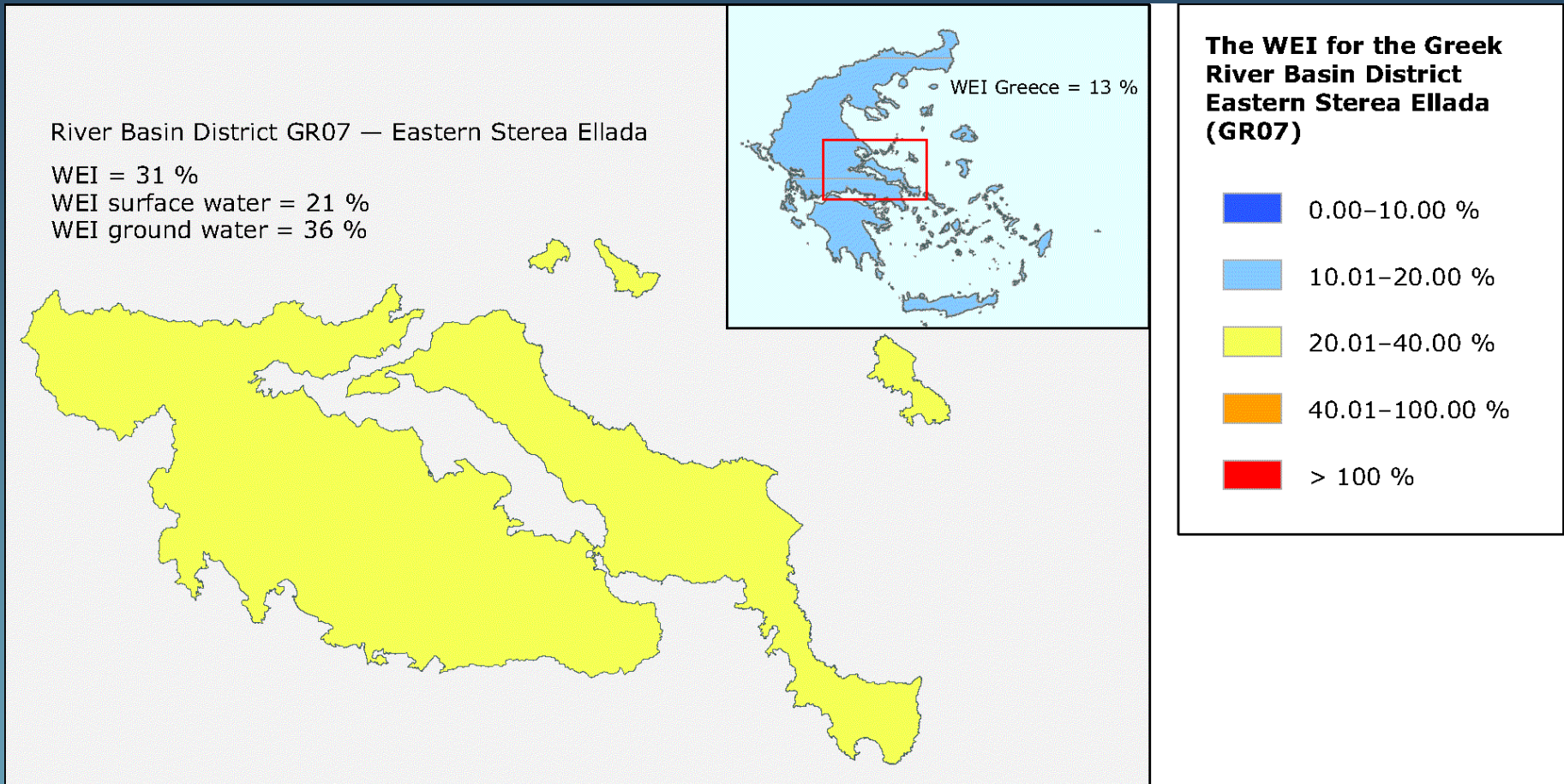


The EEA water accounting methodology

- River Basin Districts as units for visualisation, sub-catchments for calculations
- Monthly data for evolution within a year



The need for local and regional water balances



Compiled by the ETC/ICM based on data provided in the Drought and Water Scarcity Management Plan of GR07 (Hellenic Ministry of Environment, Energy and Climate Change and NAMA S.A., 2012).

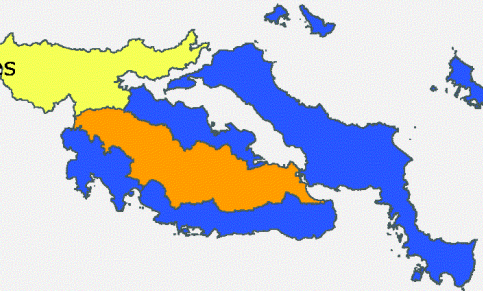
The need for local and regional water balances

Water Exploitation Index at river basin scale (GR07)

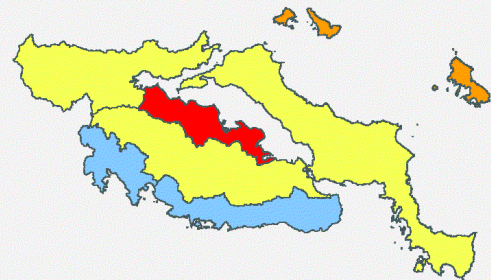
WEI



WEI surface water

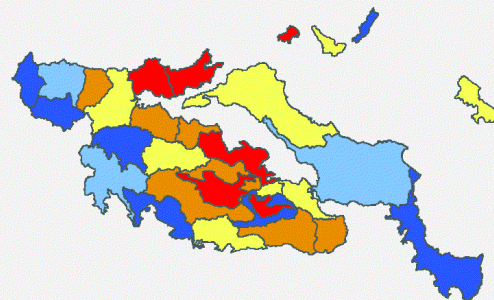


WEI groundwater

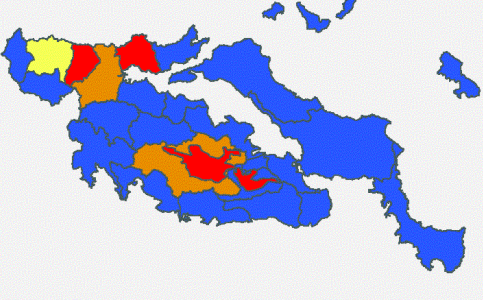


Water Exploitation Index at Subcatchment Scale (GR07)

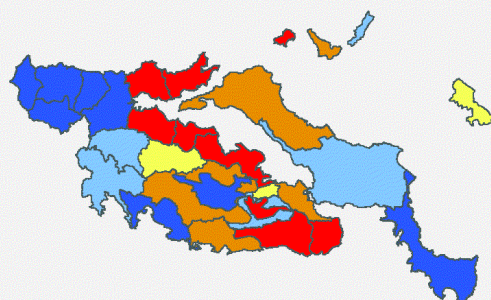
WEI



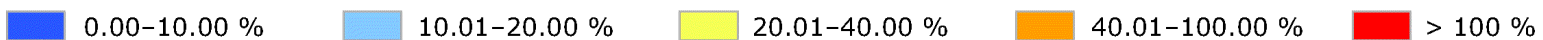
WEI surface water



WEI groundwater



The WEI at river basin scale and subcatchment scale within the Greek RBD Eastern Sterea Ellada (GR07)



Thank you!

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