

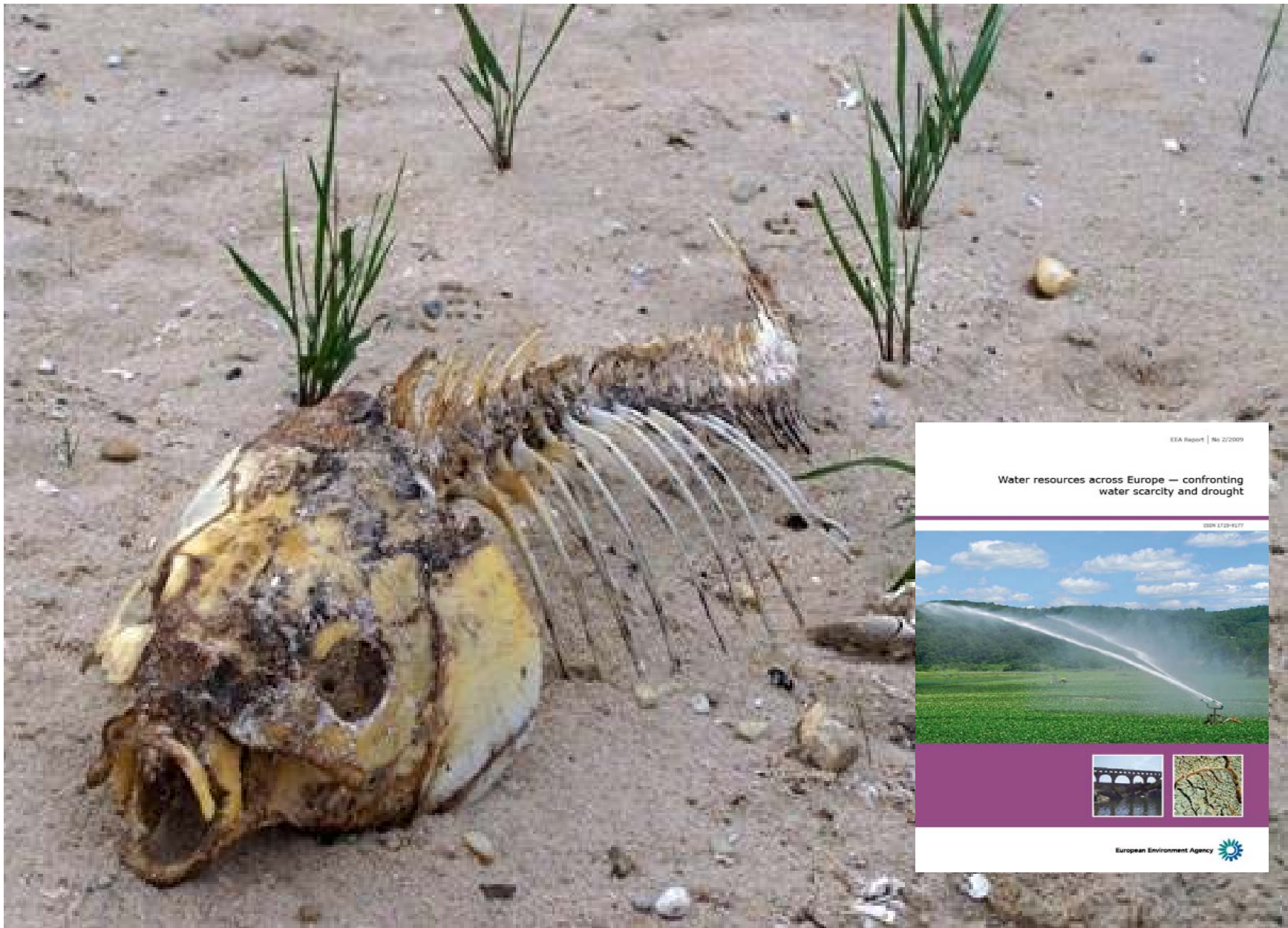
# Water: Under Pressure

Water: Under Pressure

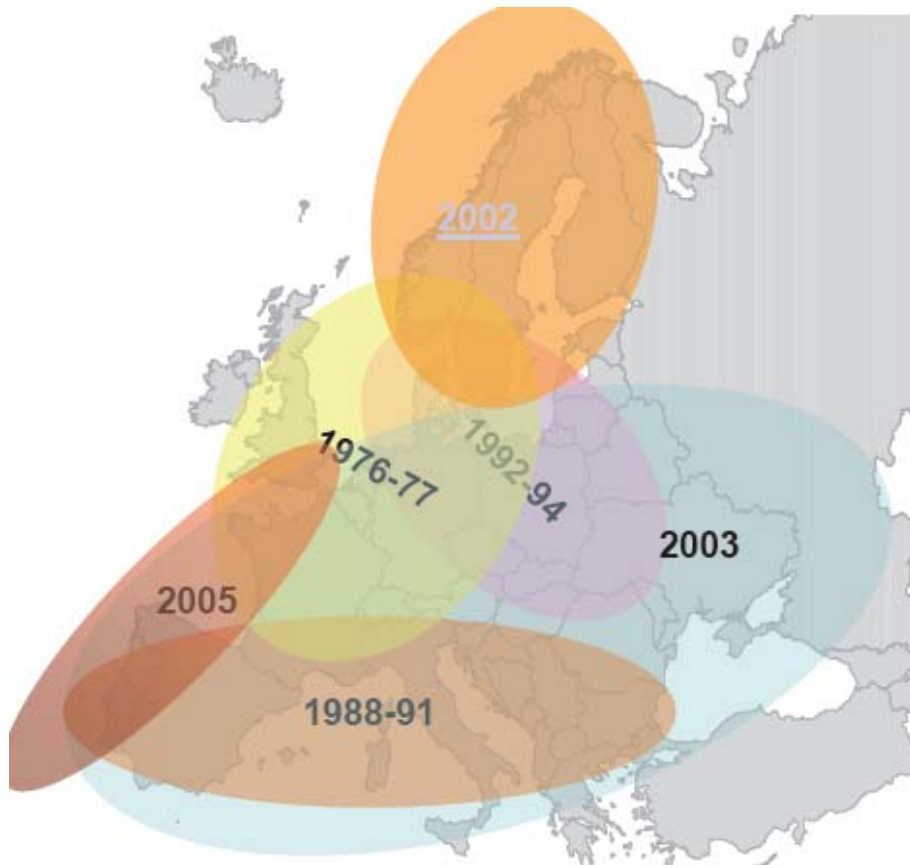
How big is the problem with  
Water Scarcity & Droughts  
in the EU? – available data  
and indicators

**Peter Kristensen, EEA**





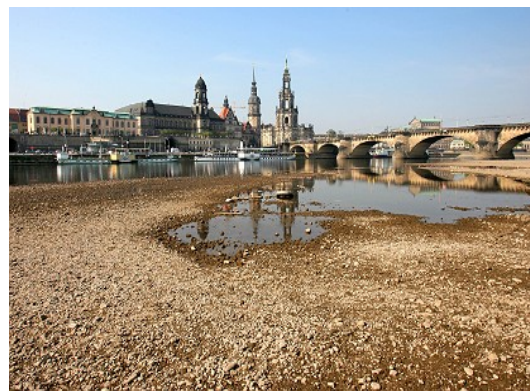
# Water scarcity and drought in Europe



Reservoir,  
Sicily



Reservoir  
, Cyprus



River  
Elbe,  
Dresden

Spring. 2007

Source: Tallaksen L. 2007:

# Water scarcity and drought in 2008

Capacity of storage reservoirs Barcelona og Cypem spring 2008



During the summer 2008 Cyprus has received water by more than 30 tankers from Greece



Desalination plants



# What is EEA doing

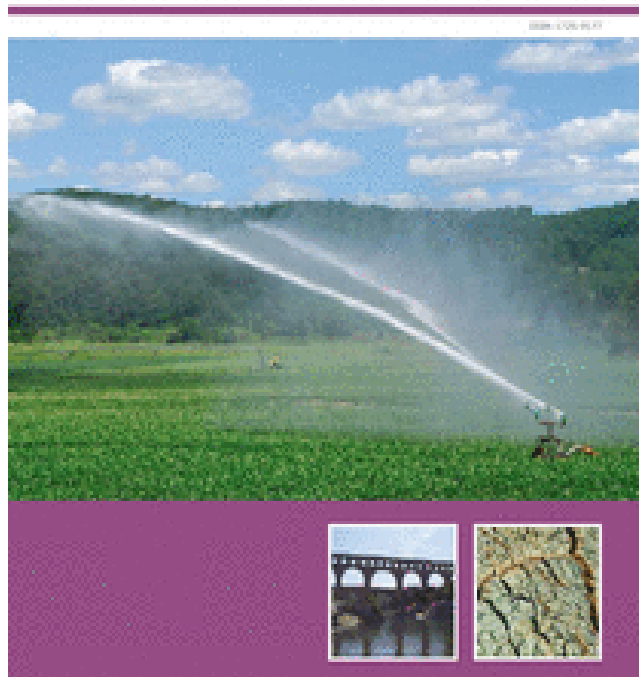
- **Comprehensive WS&D assessments**
  - **Water resource report** – EEA 2009: " Water resources across Europe — confronting water scarcity and drought"
  - Climate and water impact indicators
  - Regular update of EEA water indicators
  - **WS&D chapter in the next EEA State of the Environment and Outlook Report SOER2010**
- **Improve data and information** (Water availability, abstraction and use)
  - **Regular reporting of water quantity data** – WISE-SOE Water Quantity –
  - Cooperate with Eurostat on water statistics; JRC on drought information
  - Cooperate with other stakeholders (Eureau, ECMWF, requirements to GMES climate service; Water Footprint)



# Water resources across Europe — confronting water scarcity and drought

EPA Report | No 3/2009

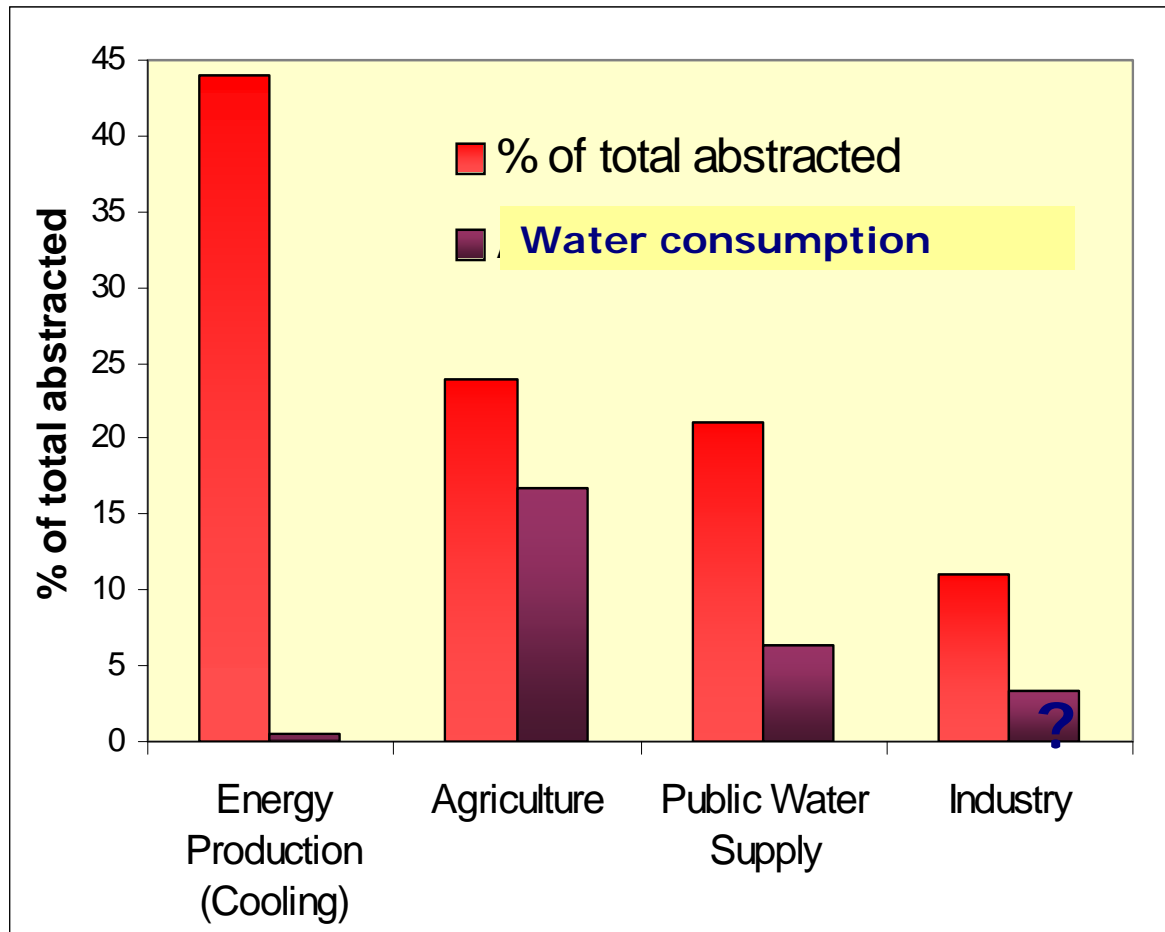
Water resources across Europe — confronting water scarcity and drought



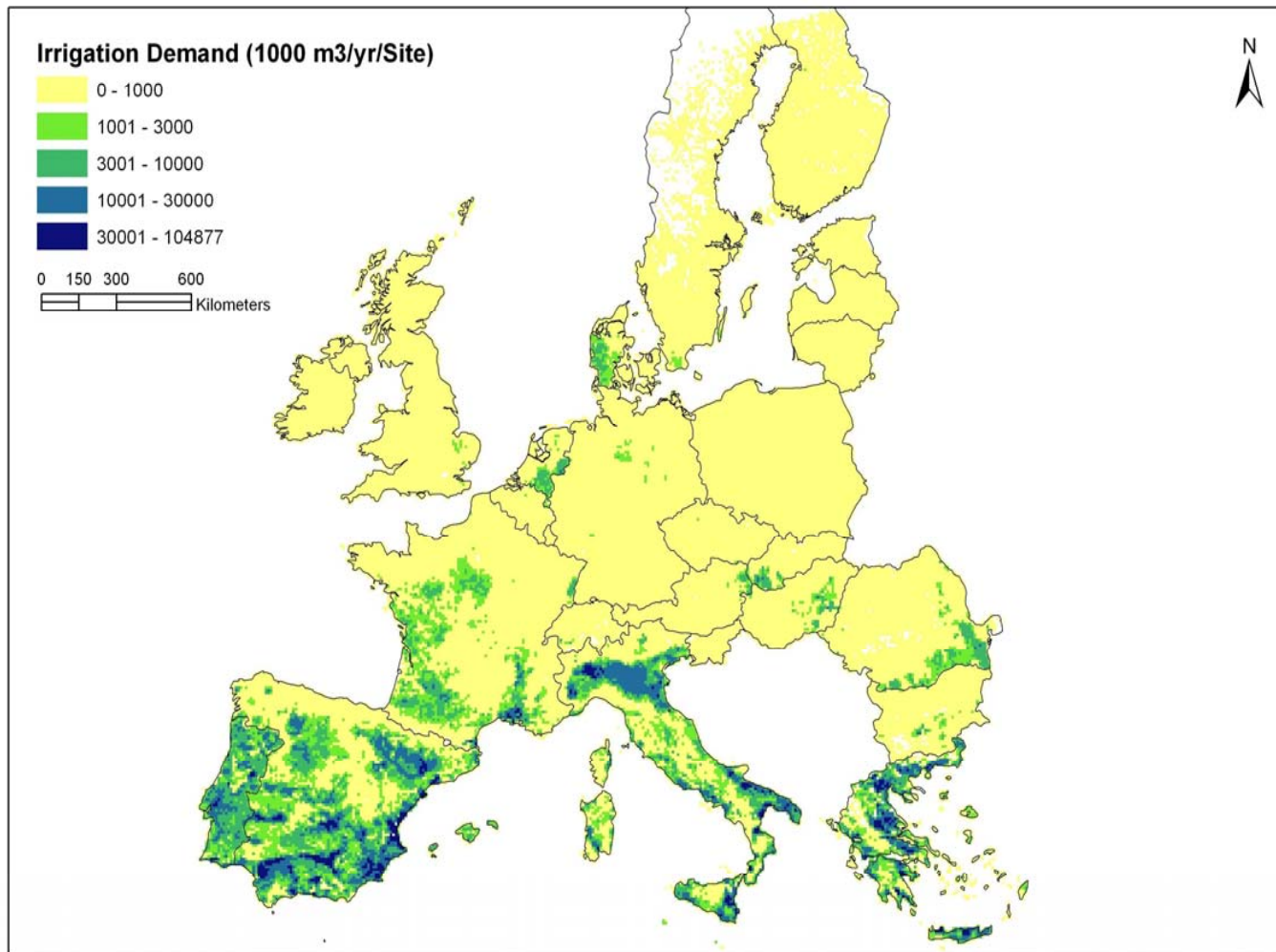
European Environment Agency 

- Introduction
- Water availability, abstraction and supply
- Impacts of water abstraction and supply
- Water abstraction for industry and energy production
- Public water supply
- Agricultural water use
- Conclusions on future water resource management in Europe

# Four key abstracting sectors.....



# Irrigation; up to 80% of total water abstraction in the South



Source;  
JRC 2008

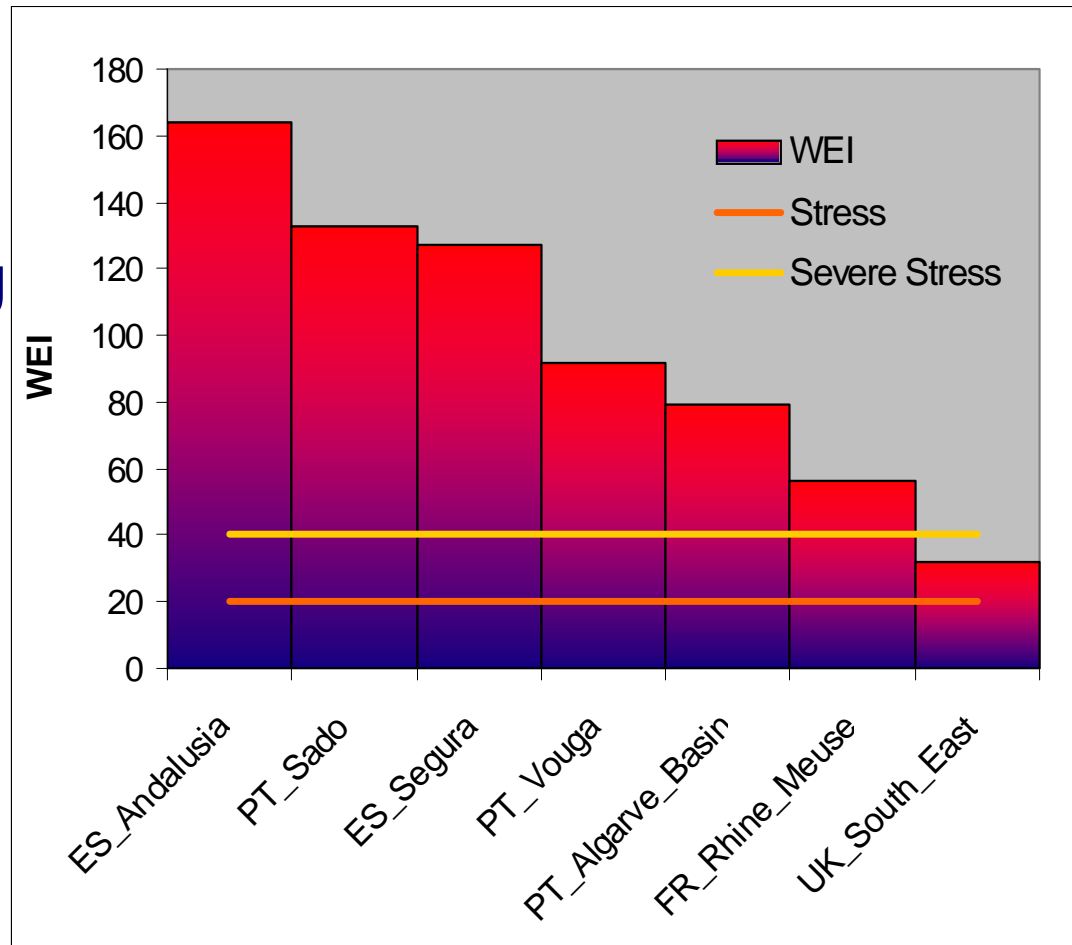


# Tourism – Water Demand

- Tourist water use can be twice that of locals (OECD)
- Peak demand when availability is at a minimum
- Golf courses – irrigation and swimming pools



# Water Exploitation Index (WEI) indicates extreme stress



# Supply-led management is unsustainable

Reservoirs, inter-basin transfers, desalination etc have provided no incentive to limit abstraction



# Sustainable demand-led approach is required to managing Europe's water resources

Focus on conserving water and using it more efficiently

Account for the need for healthy freshwater ecosystems

Less water use also means lower energy consumption

# Why do we need better European information on water availability and water abstraction?

- Reliable information on the extent and impacts of water scarcity and droughts is indispensable for decision-making at all levels.
- High data gaps and data uncertainty in estimating water availability, and water abstraction at European level
- UN WWDR3 2009: Our knowledge of water use is as poor as our knowledge of water resources – perhaps poorer. Information is largely incomplete – particularly for agriculture, the largest user – and is lacking altogether for some countries.
- Only limited disaggregated information exists, and even this shows deficiencies of validity and homogeneity and provides extremely poor information on trends.



# Water scarcity and drought communication 18 July

- *Communication from the Commission to the European Parliament and the Council - Addressing the challenge of water scarcity and droughts in the European Union {SEC(2007) 993} {SEC(2007) 996}*

## 2.7. Improve knowledge and data collection

### 2.7.1. A water scarcity and drought information system throughout Europe

The issue:

Reliable information on the extent and impacts of water scarcity and droughts is indispensable for decision-making at all levels. Shared definitions are necessary to ensure data consistency at EU level. **The recently published Water Information System for Europe (WISE) provides the ideal platform to integrate and disseminate such information.**

Way forward:

- **Present an annual European assessment, based on agreed indicators and data provided by Member States and stakeholders to the Commission or the European Environment Agency on a yearly basis.**
- Fully exploit the Global Monitoring for Environment and Security (GMES) services for the delivery of space-based data and monitoring tools in support to water policies, land use planning and improved irrigation practices.



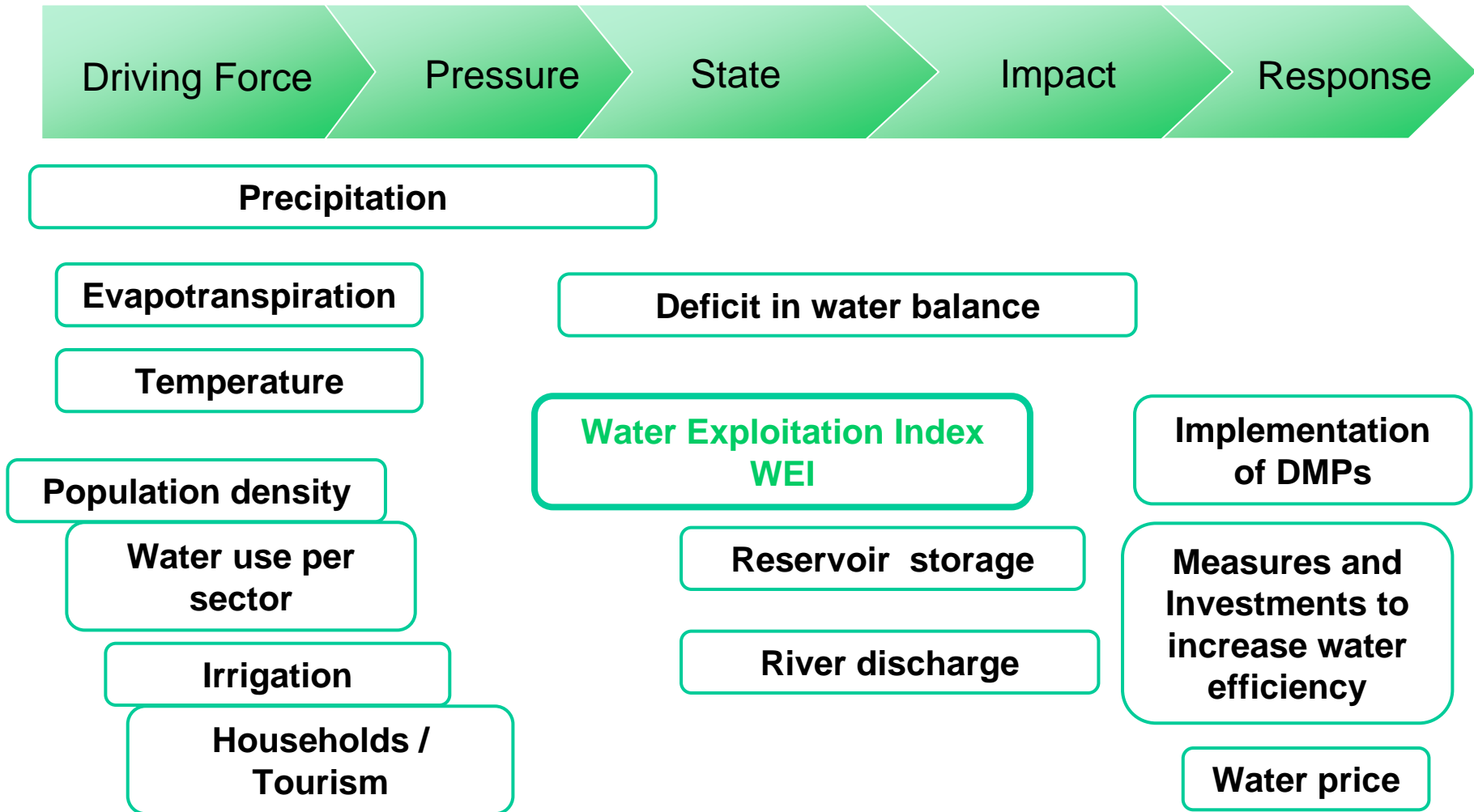
# European information needed in relation to water scarcity and drought

- **How much is there?** (Runoff, availability, demands, water stress.....)
- **Getting better or worse?**
- **Pressures on the environment** (abstraction and water use by sectors)
- **Are they working towards targets?** such as are water-pricing policies used to provide adequate incentives for users to use water resources efficiently
- In addition, information on how **climate change may affect water availability** and change in run-off and flow regimes, and the **demand for water** are also relevant.

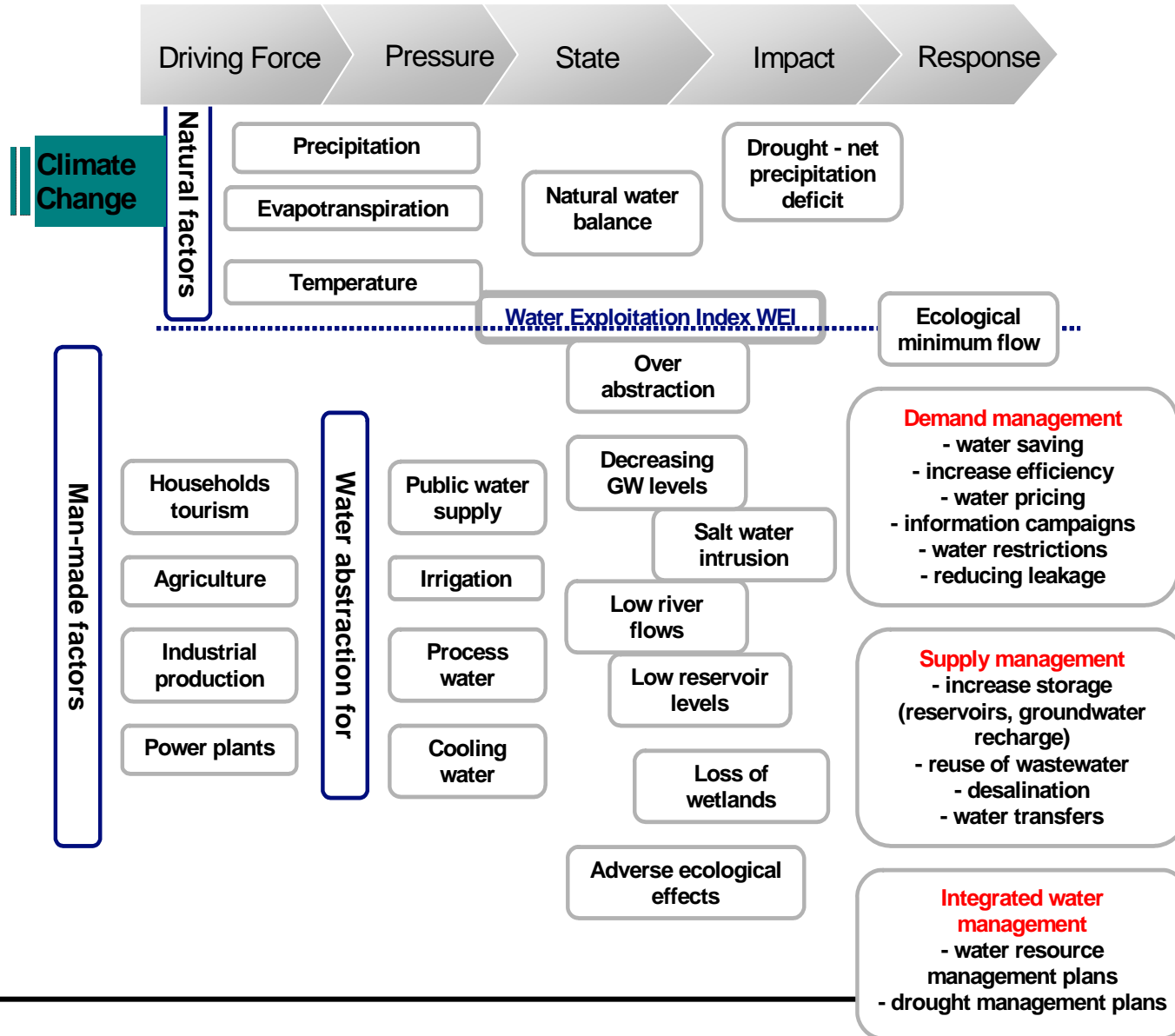
*Without countries and regional authorities there would be no data at European scale ....*



# DPSIR framework for WS&D



# WS&D Assessment framework



# The quality of European water scarcity data collections and assessments are affected by the following issues:

- **Data gaps**
- Problems with **timeliness** of the data used at European level
- Current data flows are only covering part of the information needed for European assessments (**country aggregated averages on an annual time scale**).
- **European assessments are not taking enough stock of results and analysis at national and RBD level**
- **Lack of harmonization in estimation and quality assurance methodologies.**



# Data gaps and timeliness of data

## Total fresh water abstraction (mio m<sup>3</sup>) Eurostat

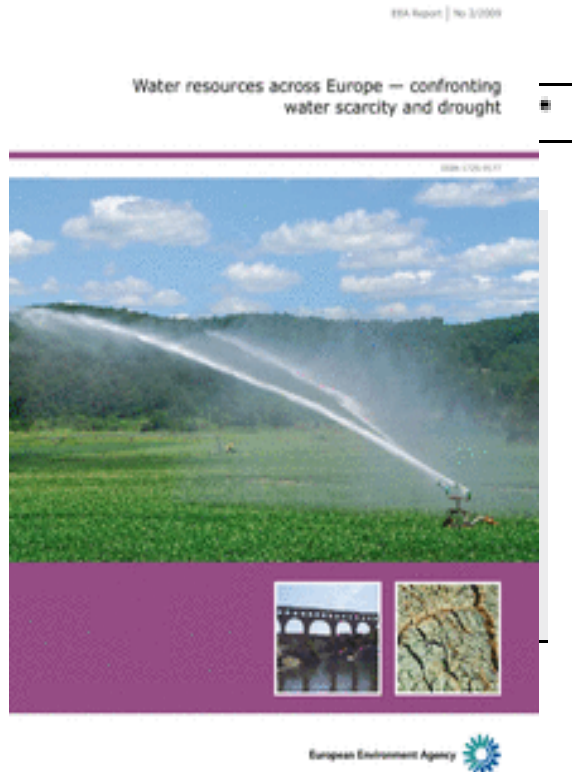
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Belgium	7552	7690	7480	7212	7535	6994	6737	6666	6447	6389		
Bulgaria	7159	7534	7905	6818	6132	5833	6589	6918	6282	6017	6557	6182
Czech Republic	2570	2493	2277	1976	1918	1839	1908	2116	2028	1949	1937	1969
Denmark	961	933	754	701	726	708	668	651	680			
Germany			40591			38006			35557			
Estonia	1630	1628	1598	1527	1471	1471	1413					
Ireland										799		730
Greece	7721	8695			9924	9774	9259	9614	9576	9654	9447	9539
Spain		34603	36839	38281	37071	37496	37521	38512	38158	34958	33760	
France					32715	33545	33163	35397	33715	33873	32552	
Italy			41982									
Cyprus			177	200	187	193	207	230	257	221	218	209
Latvia	403	363	344	307	283	258	256	254	230	238	209	211
Lithuania	5696	4786	5125	4644	3578	2768	3126	3327	3278	2365	2081	2269
Luxembourg				61								
Hungary					18878	21091	21033	18629	20699	19053	17972	
Malta	22	20	18	19	19	16	16	15	15	14	13	14
Netherlands	6507					8915		10422	10386	10326	9779	
Austria	3663	3644	3505	3668								
Poland	12892	12799	12245	12246								
Portugal			11090									
Romania	10450	9260	9051	8570	7967	7343	7239	6500	5850	5301	5330	5934
Slovenia							899	848	986	924	907	935
Slovakia	1371	1310	1226	1162	1172	1139	1094	1041		907		688
Finland				2328								
Sweden	2725	2711	2711	2711	2688	2676	2676	2676	2676	2630	2630	2630
United Kingdom												
Former Yugoslav R					692	668	633	826	1675	1157	900	551
Turkey	34078	35552	37490		43650	44450						
Iceland	162	160	161	162	163	164	165	165	165	165		
Norway												
Switzerland	2555	2559	2566	2560	2564	2539	2518	2588	2532	2507	2660	

Data from 40 % of the years are missing

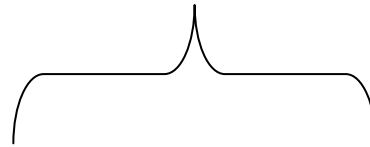


# Improve the **timeliness**

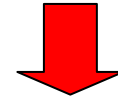
## Data and diagrams



**Time lag**  
**5-10**  
**years**



**Improve the timeliness**



**More policy relevant**

**&**

**Reflecting the data**  
**available at country**  
**level**



# Methodology

The quality of information systems varies with each country, but there are common difficulties:

- Statistics on the magnitude of demand and withdrawal **are often estimated rather than based on data** that are measured or collected from censuses. The level of uncertainty varies, but is particularly high for agriculture.
- Sectors of use are not defined homogeneously and are not well disaggregated.
- **Adequate historical datasets are rare**, and the dates of available statistics are not always explicit.
- Lack of agreed terminology leads to discrepancies in data compilation and analyses.



# Lack of harmonization in methodologies

Irrigation

		2000	2001	2002	2003	2004	2005
Spain	Abstraction by <b>agriculture</b> , forestry, fishing (total)	24070	24568	24461	25022	24620	:
	Abstraction by agriculture, for <b>irrigation purposes</b>	23730	24248	24146	24407	23990	:
France	Abstraction by <b>agriculture</b> , forestry, fishing (total)	4872	4768	4536	:	:	:
	Abstraction by agriculture, for <b>irrigation purposes</b>	:	:	:	:	:	:
Poland	Abstraction by agriculture, forestry, <b>fishing</b> (total)	1061	1033	1108	1015	1072	1101
	Abstraction by agriculture, for <b>irrigation purposes</b>	110	83	88	86	86	93
Norway	Abstraction by agriculture, forestry, <b>fishing</b> (total)	770	878	808	746	925	1006
	Abstraction by agriculture, for <b>irrigation purposes</b>	80	177	113	69	109	144

Fish farms

## Uncertainty of statistics on water uses: importance of metering agriculture and industrial withdrawals in France

(Percentage of water withdrawals that is metered unless otherwise indicated)

Basin	Use for agriculture or irrigation		Use for self-supplied industries		Total use (cubic kilometres a year)
	From surface water	From ground-water	From surface water	From ground-water	
Adour-Garonne	72	62	82	66	2.30
Artois-Picardie	90	100	95	100	0.67
Loire-Brittany	80	95	40	69	3.62
Rhine-Meuse	0	0	90	81	5.05
Rhone-Mediterranean	30	57	87	86	17.13
Seine-Normandy	75	89	37	91	3.06
Total	43	74	73	84	31.81
Total volume (cubic kilometres a year)	3.39	1.38	2.72	1.48	

■ No metering

■ Less than 45% of withdrawals metered

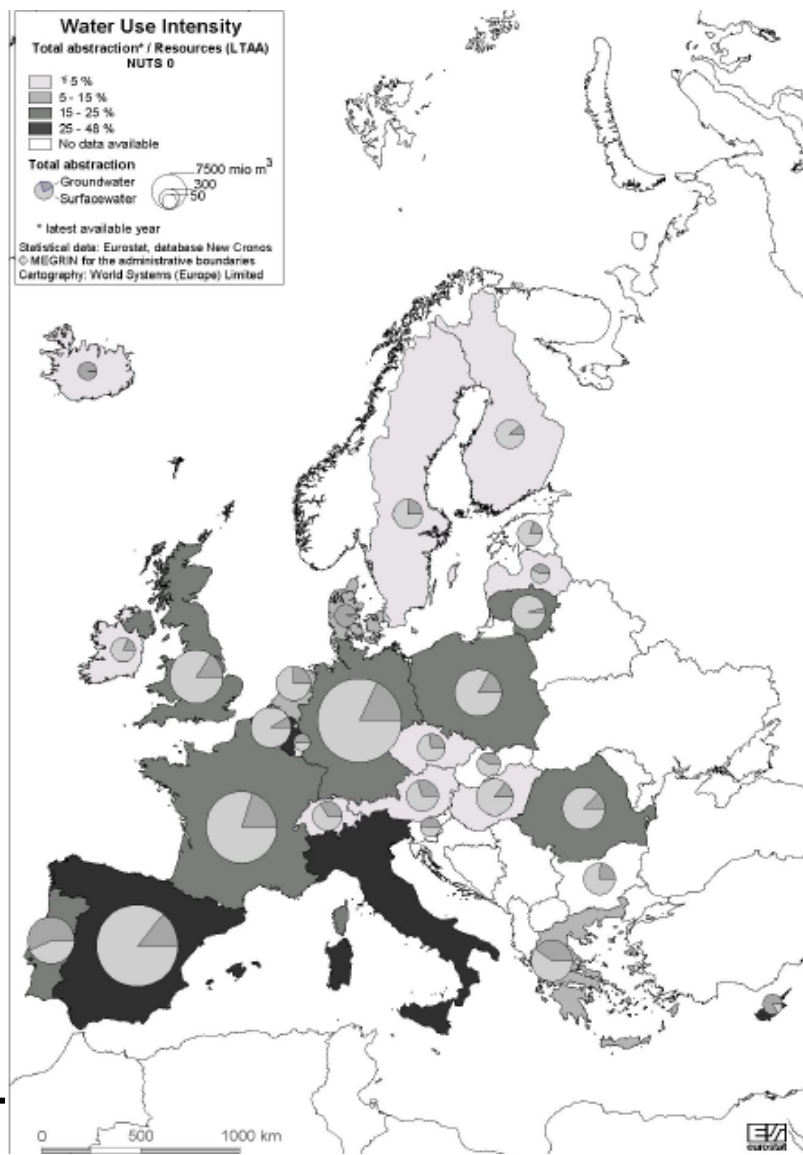
■ Less than 75% of withdrawals metered

Source: IFEN 2006, based on 2001 data from the basin agencies.



# Only **country data** are available in European data sets

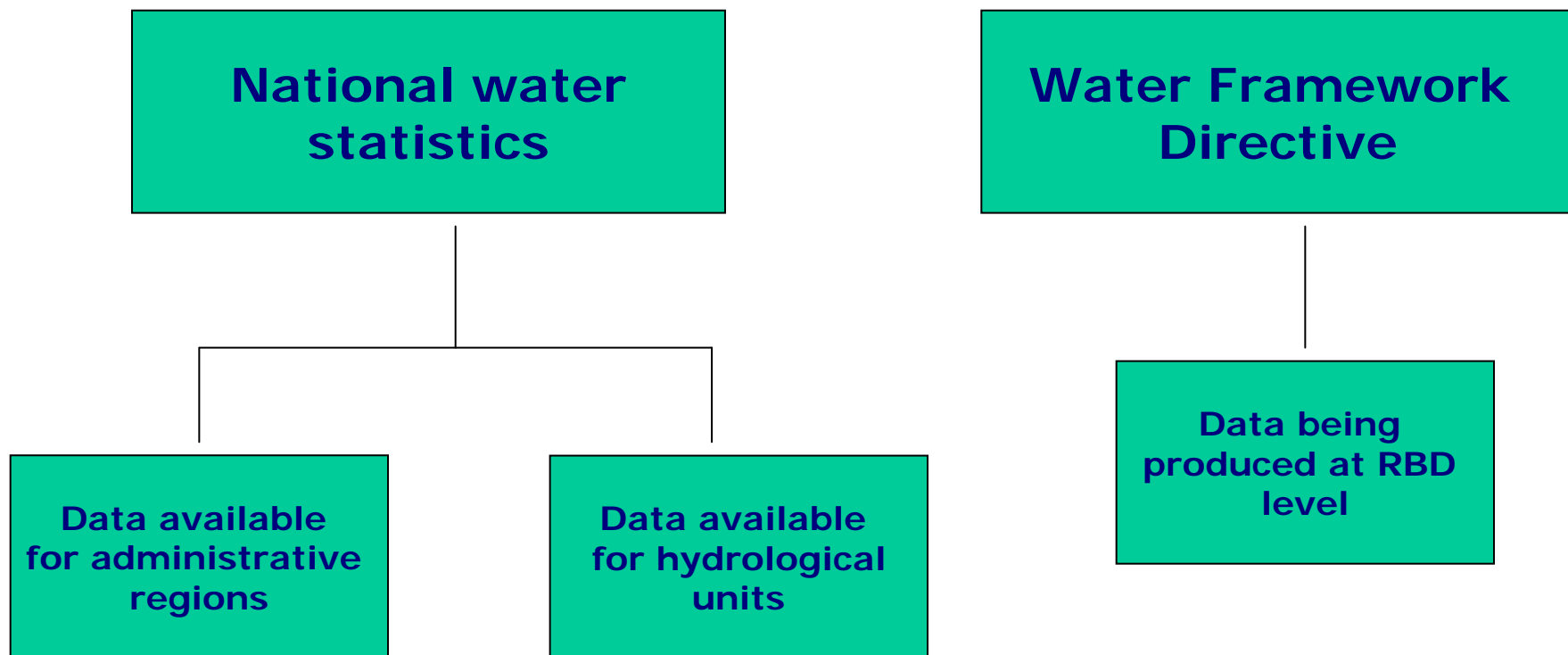
Country raster  
Water use intensity  
=  
Water exploitation index



Pie charts  
Abstractions from surface and groundwater



– but much regional information is already available



# Sistema de indicadores del agua

Indicators System Map - Microsoft Internet Explorer provided by EEA

http://servicios3.mma.es/siagua/indicadores/mapa\_indic.jsp

Google sistema de indicadores del agua

GOBIERNO DE ESPAÑA MINISTERIO DE MEDIO AMBIENTE Y MEDIO RURAL Y MARINO

Sistema de Indicadores del Agua

Home Indicators map DPSIR Model Contact

INDICATORS MAP

DRIVING FORCE	PRESSURE	STATE	IMPACT	RESPONSE
Population density 91.22 inh/km2	Water demand 29.28 hm3/year	ANTHROPIC FACTORS		
Population concentration	Urban water supply 275 Vinh/day	Cumulative flow 14,380 hm3/y	Surface waterbodies status	Water infrastruc. investment 1,061.45 mill €
Tourist overnightstays 381,593 thnd	Fertiliser consumption 134.70 kg/ha	Reservoir storage 22.94 th hm3	Groundwater bodies status	Water quality investment 395.26 mill €
Land under cultivation 17,578 thnd ha	Phytosanitary consumption 785.17 mill €	Exploitation indexes	WWTP compliance	Operative dams 809
Land under intensive cultivat. 456 thnd ha		Drought Manag.Plan Indic. Normal		Reservoir capacity 54.37 th hm3
Livestock population 57,732 thnd		Organic contamination: DBO5		Reused water volume 368.20 hm3/y
Industry GAV 147,905 mill €		Aquifers nitrate concentration		Desalinated water capacity 3,383,841 m3/d
Most polluting industries GAV 38,107 mill €				Efficient use of water 79.94 %
				Water price for household use 1.20 €/m3

Start Internet 100% 09:59



# Need for regional data – Example specific water abstraction for irrigation (m<sup>3</sup>/ha )

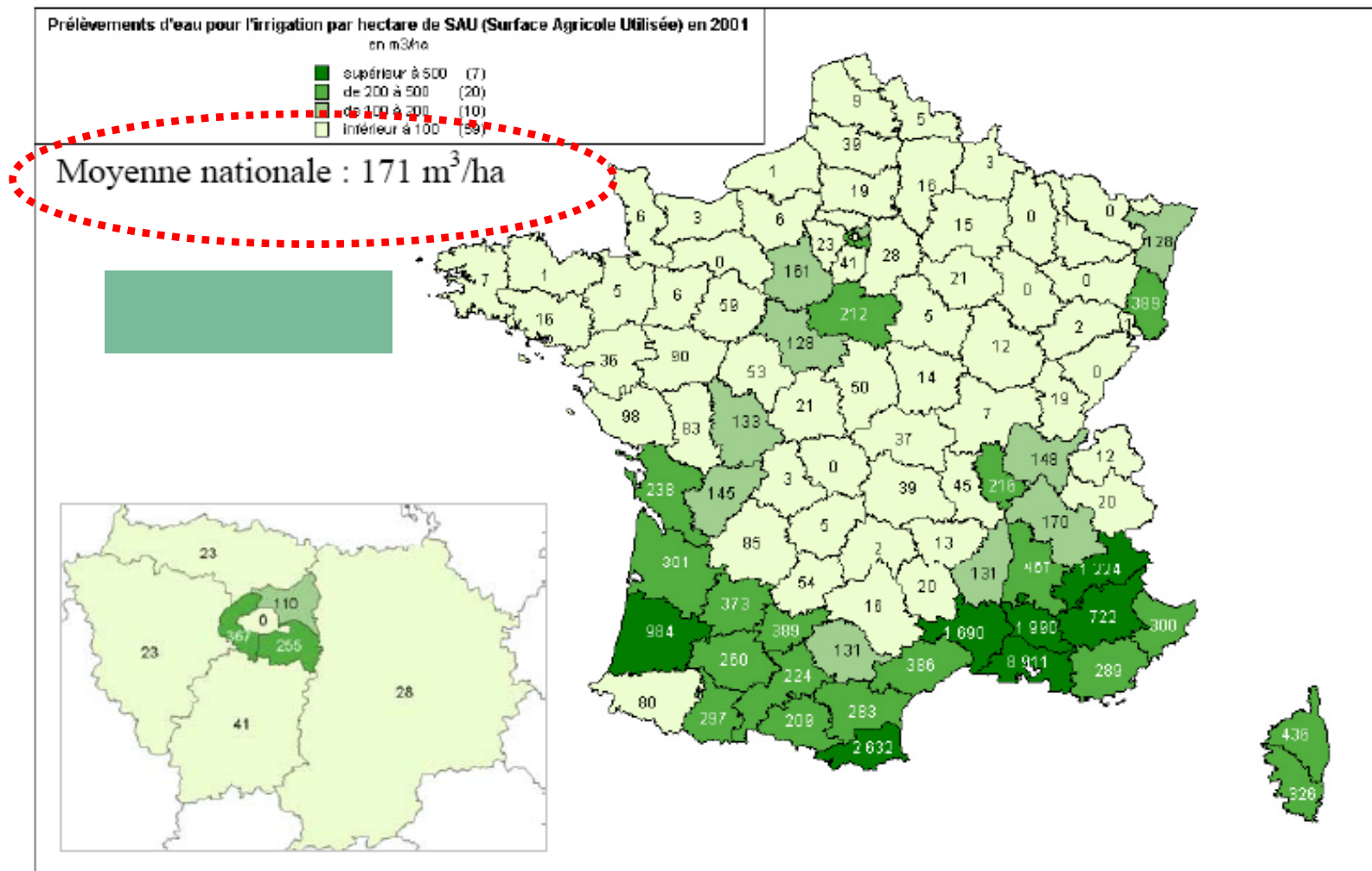


Figure 6 : volumes prélevés pour l'irrigation par unité de SAU en 2001 en France métropolitaine. Source :



# Seasonality

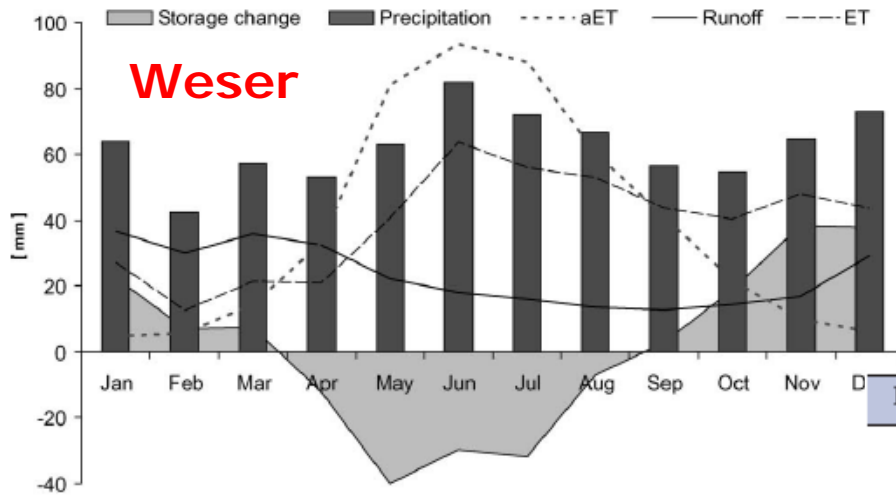
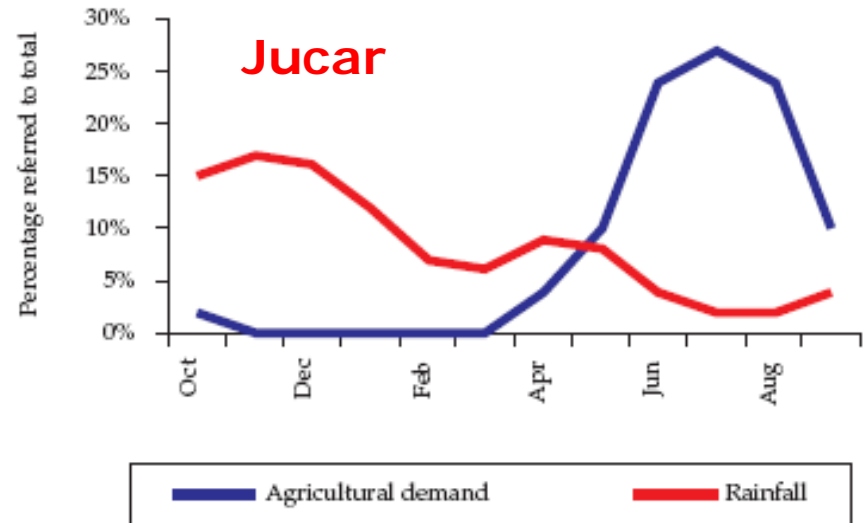


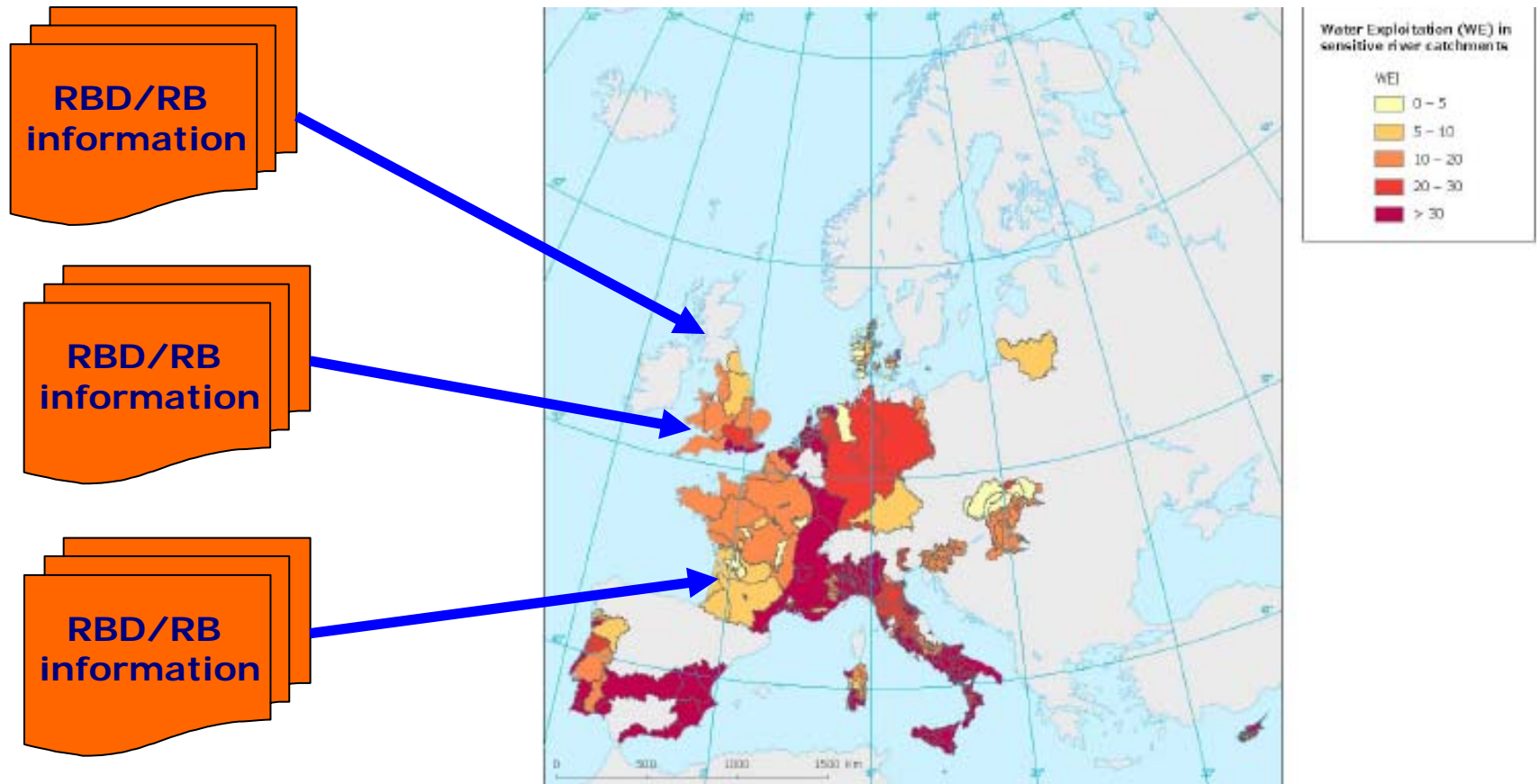
Fig. 8. Modelled mean monthly water balance for the Weser catchment (1965-1994).

Figure 107 Precipitation versus agricultural demand patterns



# From RBD information to European overview

## MS: Sensitive catchments – EEA calculated WEI

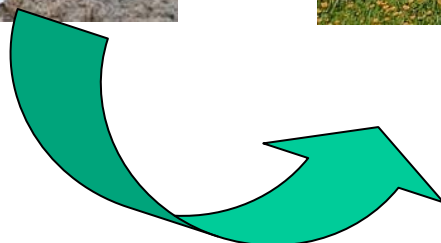
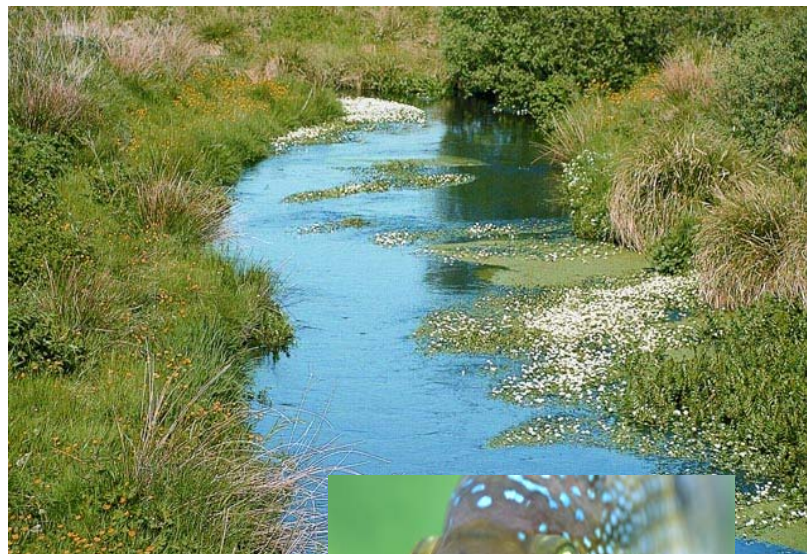


# Summary

- High data gaps and data uncertainty in estimating water availability, and water abstraction at European level
- Problems with **timeliness** of the data used at European level
- Current data flows are only covering part of the information needed for European assessments (**country aggregated averages on an annual time scale**).
- European assessments are not taking enough stock of results and analysis at national and RBD level
- Lack of harmonization in estimation and quality assurance methodologies.
- **Better reporting** (more timely, disaggregated in spatial and temporal scale) will give more reliable European data and assessments and be more policy relevant.



# Thanks for your attention



# From RBD information to European overview

Regional water abstraction rates for agriculture in million m<sup>3</sup>/a (2000)

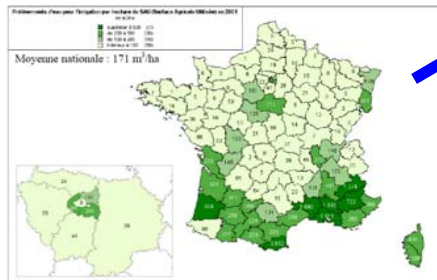


Figure 6 : volumes prélevés pour l'irrigation par unité de SAC en 2001 en France métropolitaine. Source :

Community Survey on the Structure of Agricultural Holdings (FSS), Eurostat combined with information from Eurostat questionnaire, in: EEA, 2005b: 47.

Current: Country data on water abstraction distributed by regional/nuts02 irrigated area – in the future data provided on disaggregated spatial scale

