Colloque Sylvamed:
Forests for drinking water
Marseille, 17-18th November 2010

Water resources in the Mediterranean: current situation and future prospects

Gaëlle THIVET, Plan Bleu

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- Plan Bleu, its partners and the Mediterranean
- Limited water resources, impacted by climate change
- Increasing water demand in the different using sectors & increasing pressures on resources
- Paths to more sustainable water management

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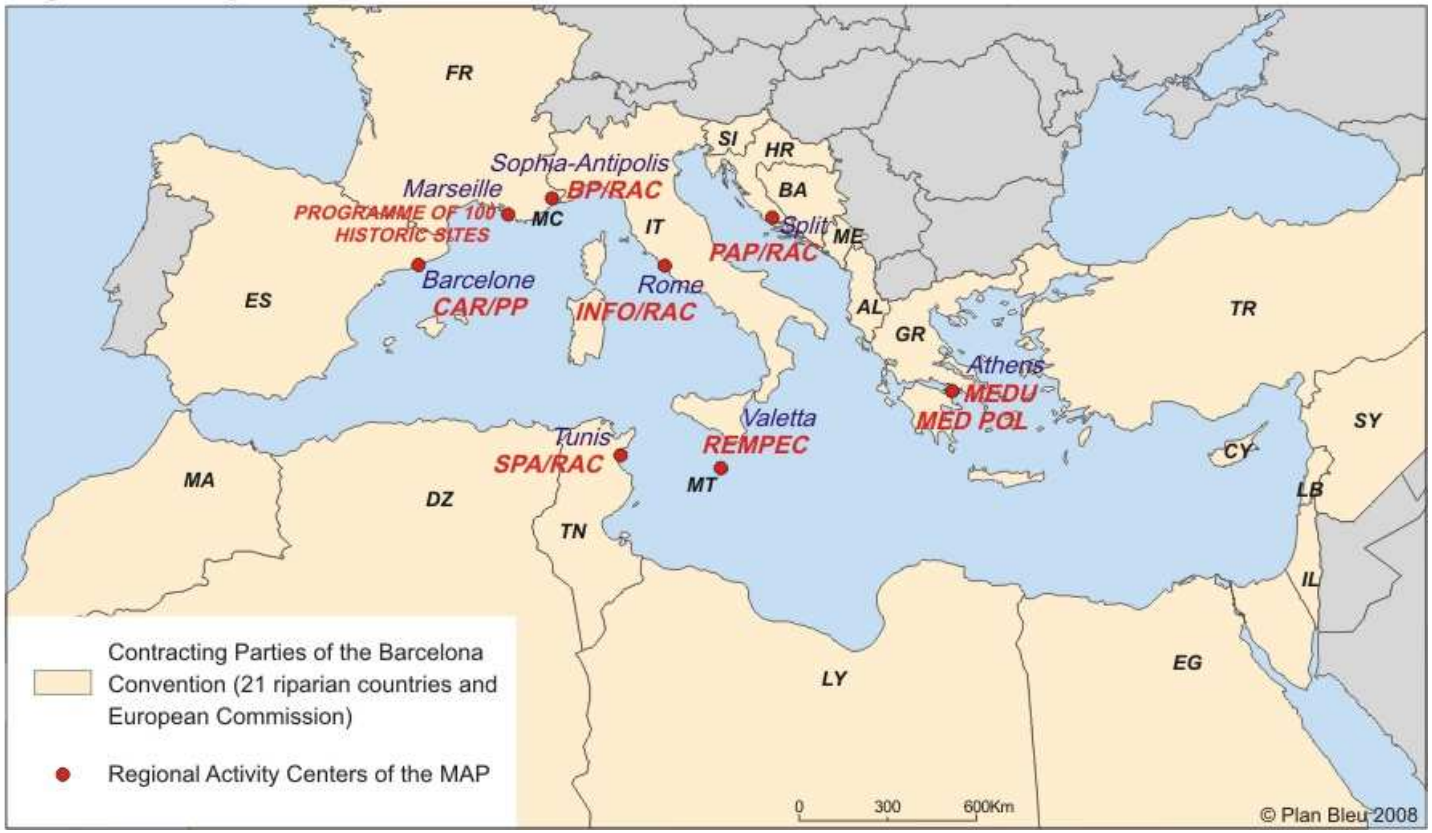
A Regional Activity Centre of the Mediterranean Action Plan

Regional activity centres of MAP

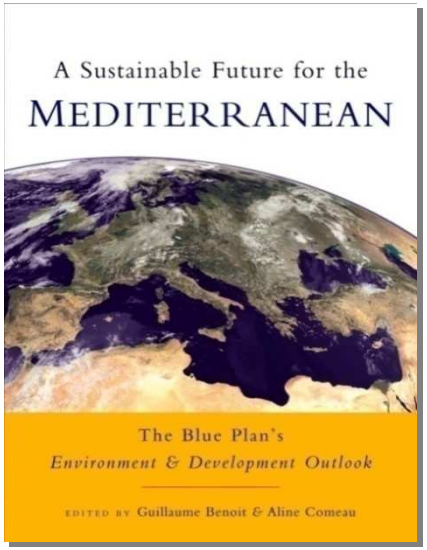


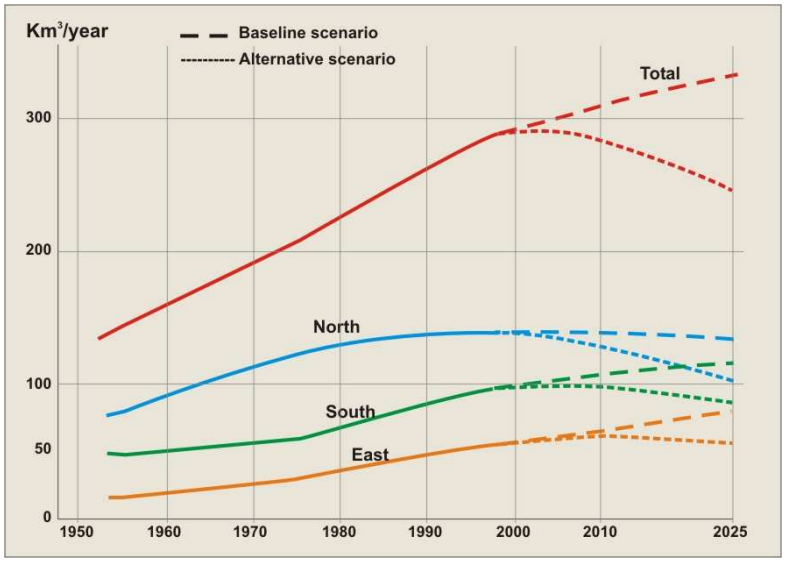
- Created 30 years ago as a systemic and prospective analysis centre
- Connected to the MAP, one of the UNEP regional seas programmes
- Meant for assisting the 21 Mediterranean-rim countries and the EC (Barcelona Convention)

A Regional Activity Centre of the Mediterranean Action Plan

An international centre which, in the framework regional cooperation, is entrusted with:

- Producing information and knowledge in order to alert decision makers and stakeholders to the challenges both environmental & sustainable development-related in the Mediterranean,
- Drawing up scenarios for the future to assist in the decision making process.





Partners

- ✓ **UN institutions**
- ✓ **European institutions**
- ✓ **Bilateral institutions**
- ✓ **Non institutional stakeholders**

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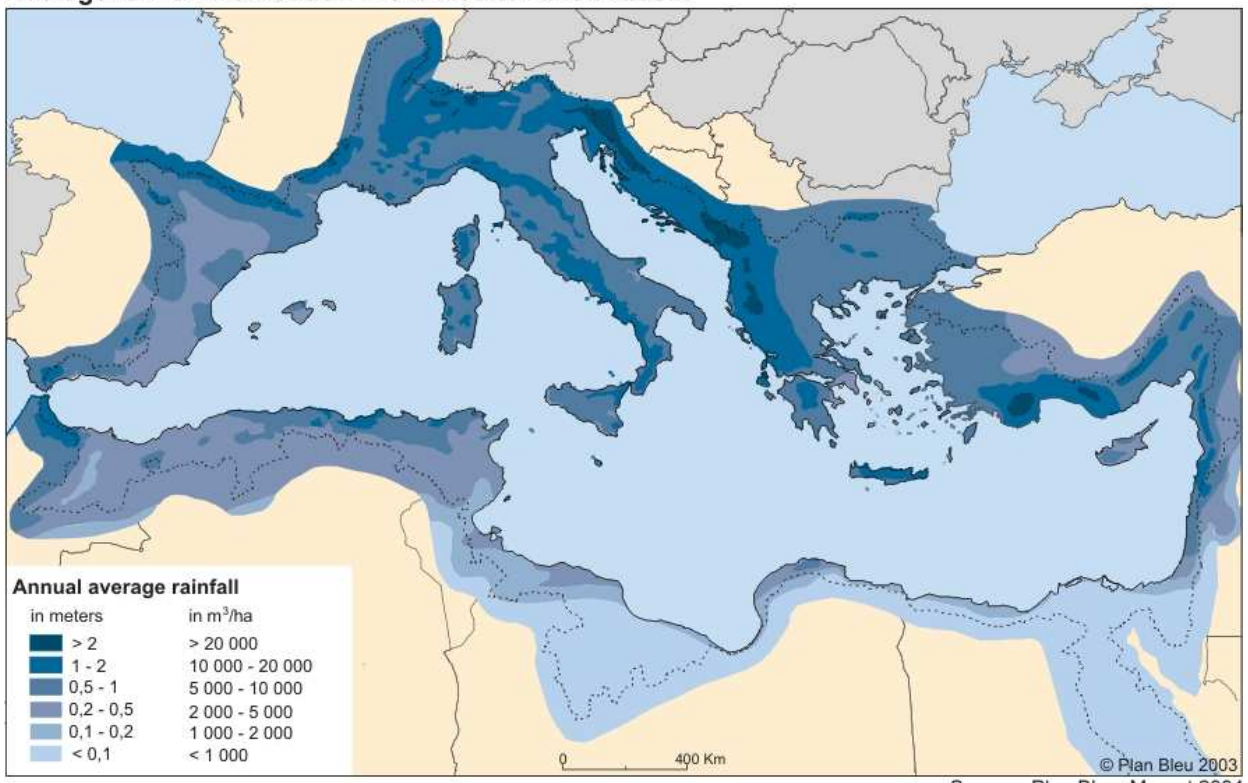
Limited and very unevenly distributed water resources

Average rainfall distribution in the Mediterranean basin



Source : Plan Bleu, Margat 2004

- 3% of the world's water resources for 7% of the world's population
- 60% of the world water poor population (<1000 m^3/cap/yr)

Limited and very unevenly distributed water resources

		North	East	South	Total Med
Renewable natural resources (« Blue water »)	km^3/y	740	245	95	1080
	%	68	29	9	100
Exploitable natural water resources	km^3/y	360	135	80	575
	%	63	23	14	100
« Green water » (rain, soil storage) estimation	km^3/y	300	100	70	470
	%	64	21	15	100
Blue water + green water	km^3/y	1040	345	165	1550
	%	67	22	11	100

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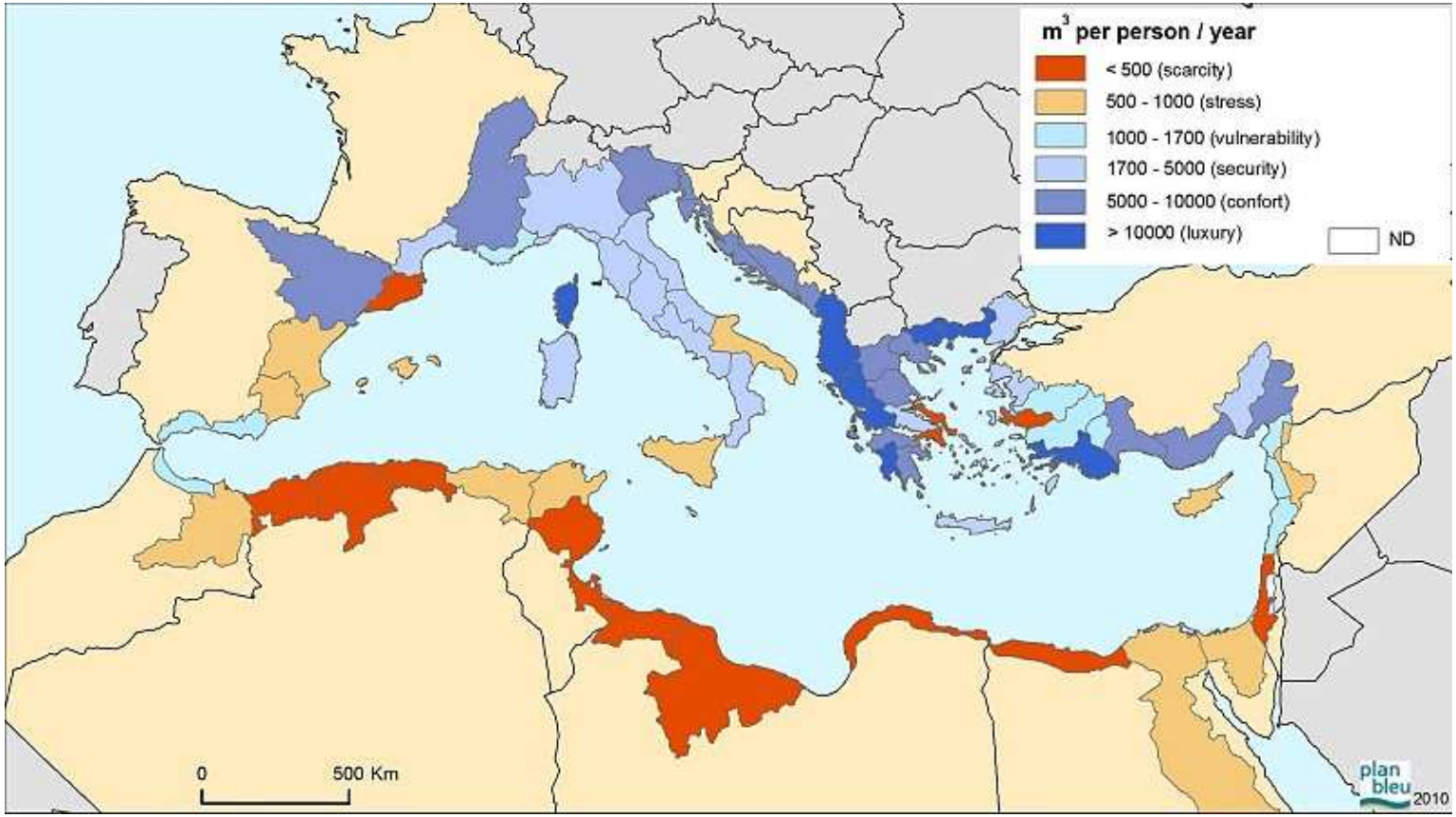
Water poverty & water scarcity



From 25 000 (Montenegro) to… 50 (Gaza) m^3/capita/year

Mediterranean average: 2400 m^3/capita/year

18 million people with no access to drinking water

Water poverty & water scarcity

Country or catchment area	Population (Mio hab)	Natural water resources (km3/an)	WR per capita (m3/an)
Catalonia	6,530	2,79	427
Spain	*44,121*	*111,5*	*2 527*
Languedoc-R.	1,959	5,48	2 797
Provence-Var	3,41	3,84	1 126
France	*61,256*	*200*	*3 265*
Liguria	2,564	5,3	2 067
Italy	*58,842*	*191,3*	*3 251*
Slovenia	2,007	*31,87*	*15 881*
Greece	*11,147*	*74,25*	*6 661*

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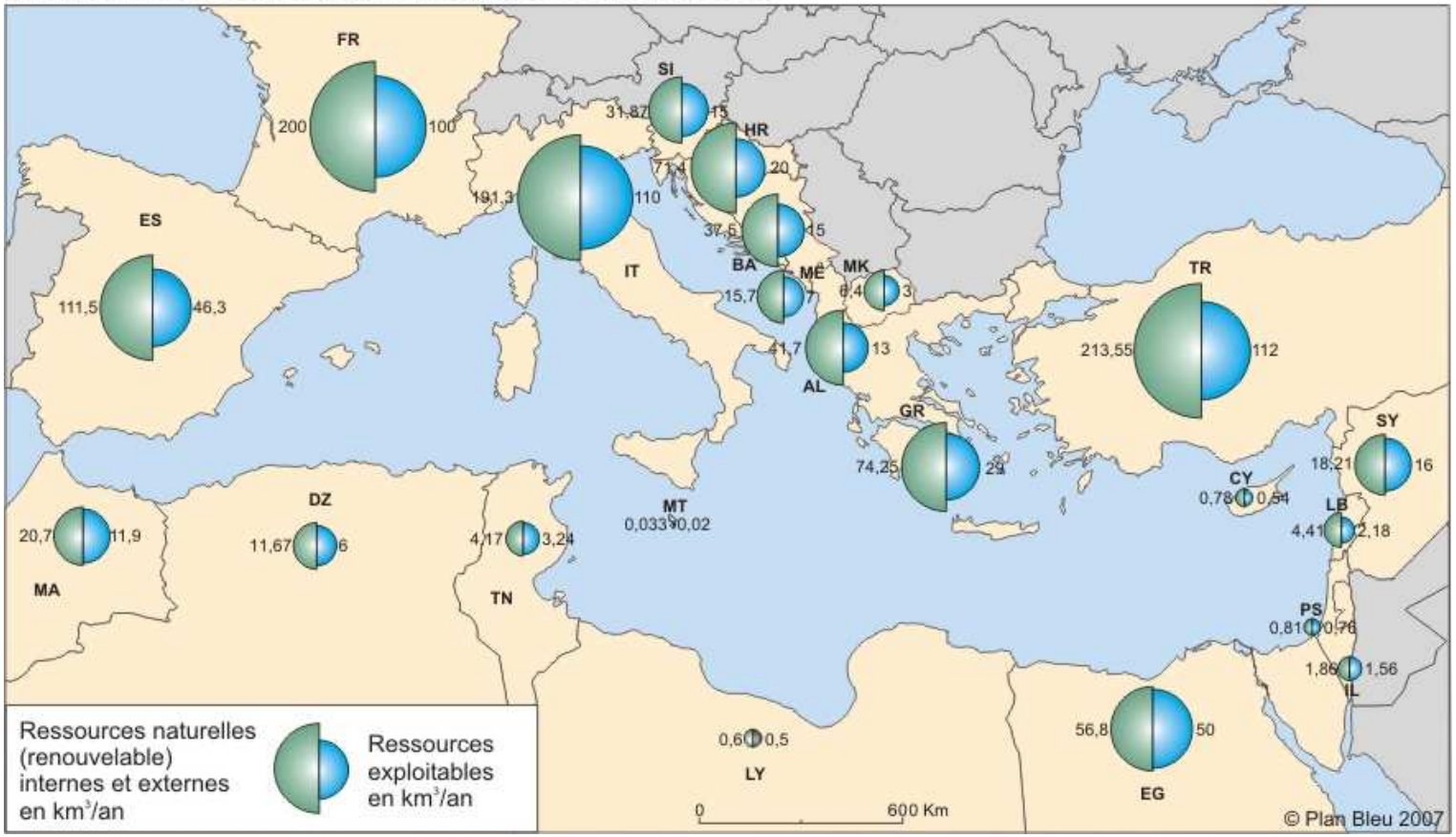
Exploitable water resources

Ressources en eau naturelles renouvelables et ressources en eau exploitables (moyennes annuelles) dans les pays méditerranéens



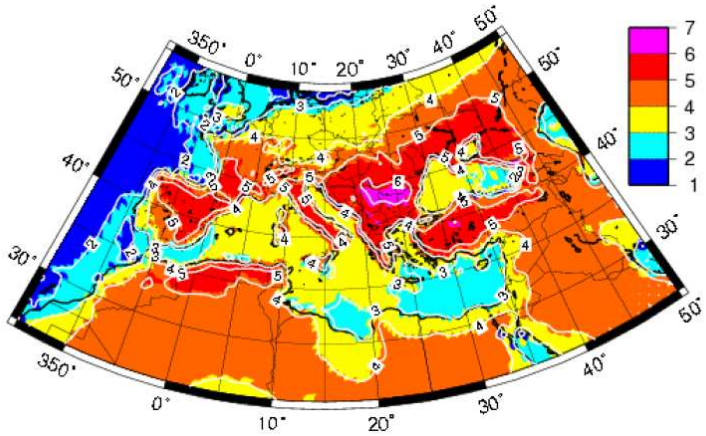
Acounting from one third to a half of renewable natural water resources
(environmental, socio-economic constraints)

The Mediterranean: a «hot spot» of climate change

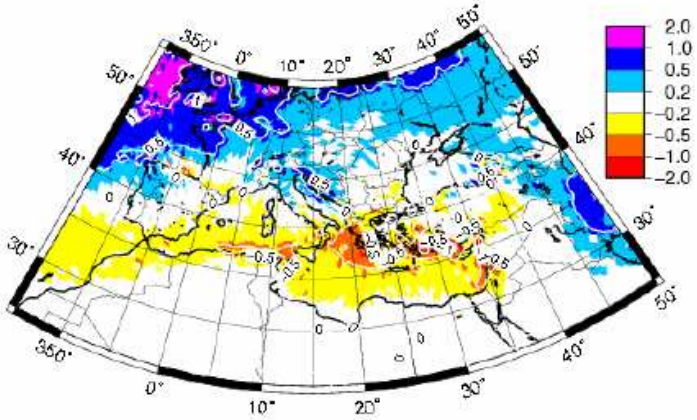
IPCC Projections for the Mediterranean
1980-1999 vs 2080-2099, A1B scenario

- Increase in temperature from 2,2 to 5,1°C
- Decrease in average rainfall from 4 to 27%
- Increase in extreme events (droughts, floods)

Surface air temperature (°C) :
2070-2099 vs. 1961-1990
Summer



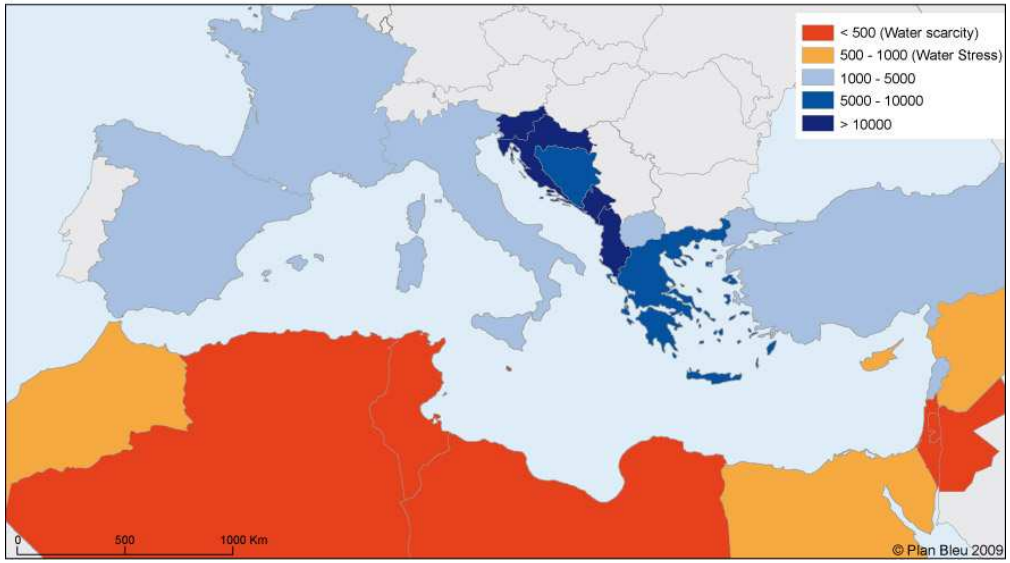
Seasonal precipitation (mm/d) :
2070-2099 vs. 1961-1990
Winter



Somot & al., 2007

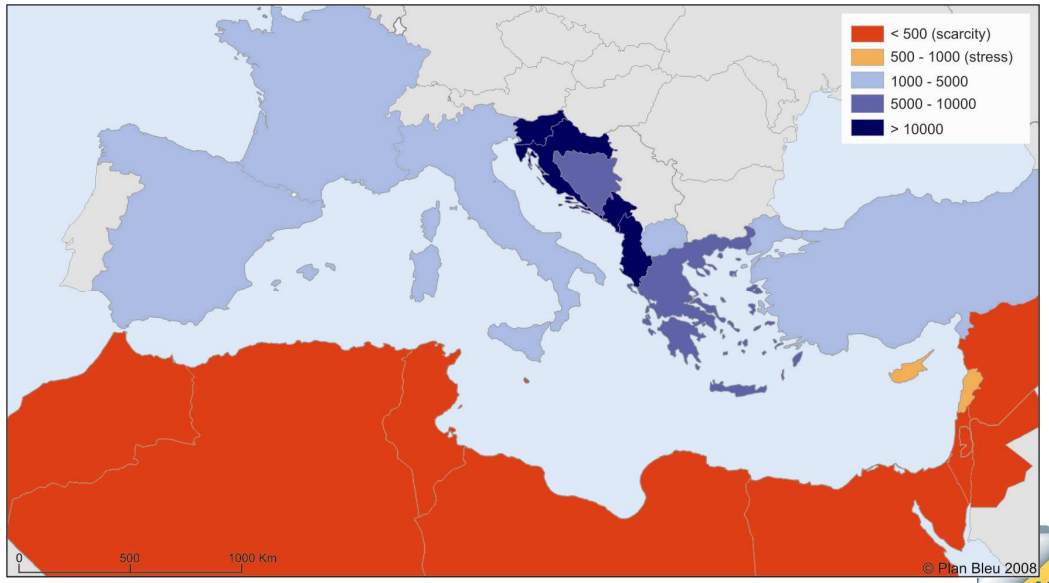
Increased water poverty and water scarcity

Renewable natural water resources per inhabitant per year in 2005



60 million Mediterranean people facing shortage conditions in 2005

290 million people would face shortage conditions in 2050 (scenario B1)



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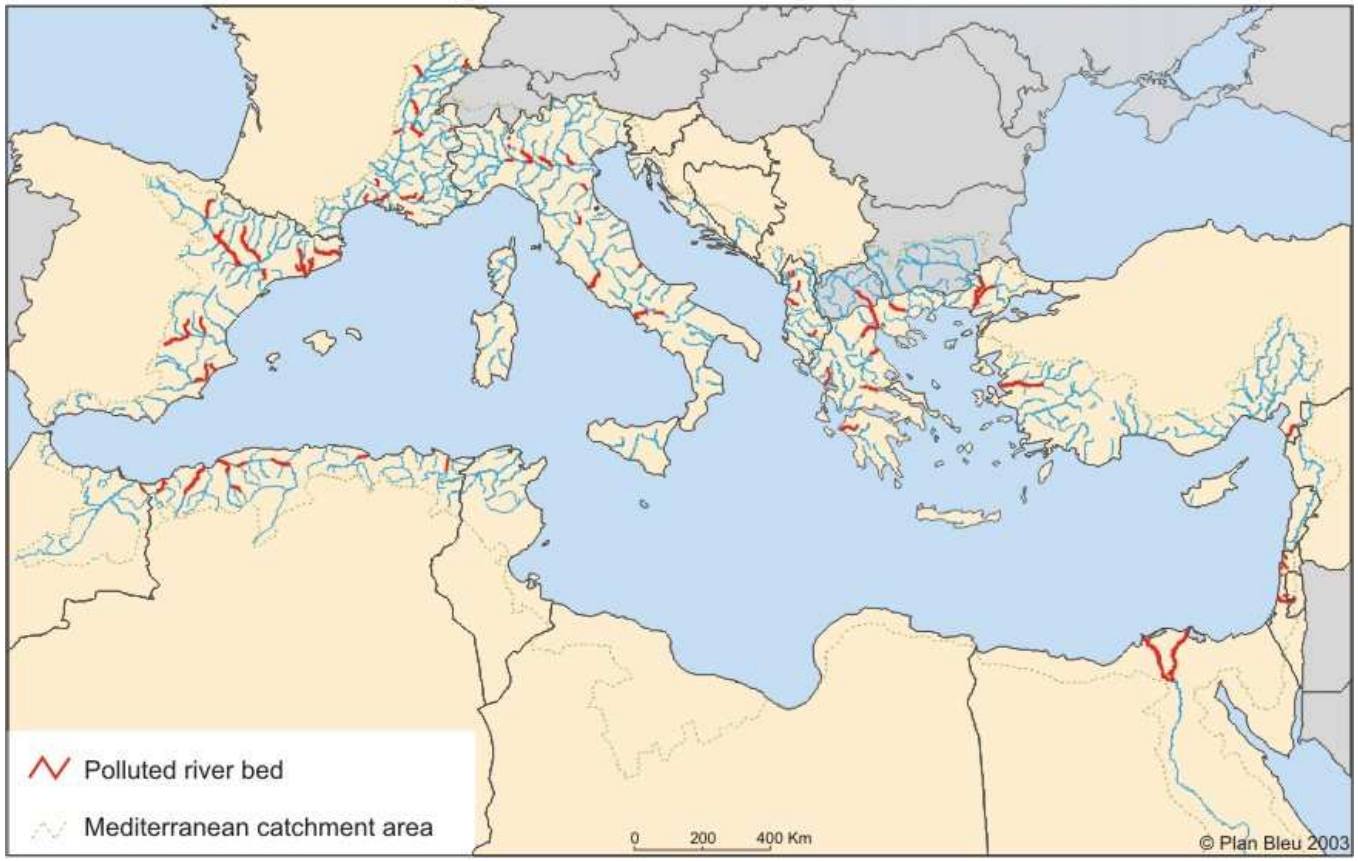
Pressures are also qualitative

Main rivers subjected to chronic pollution



Many aquifers with high contents of pesticides/nitrates

Rivers subjected to chronic pollution (non treated discharges)

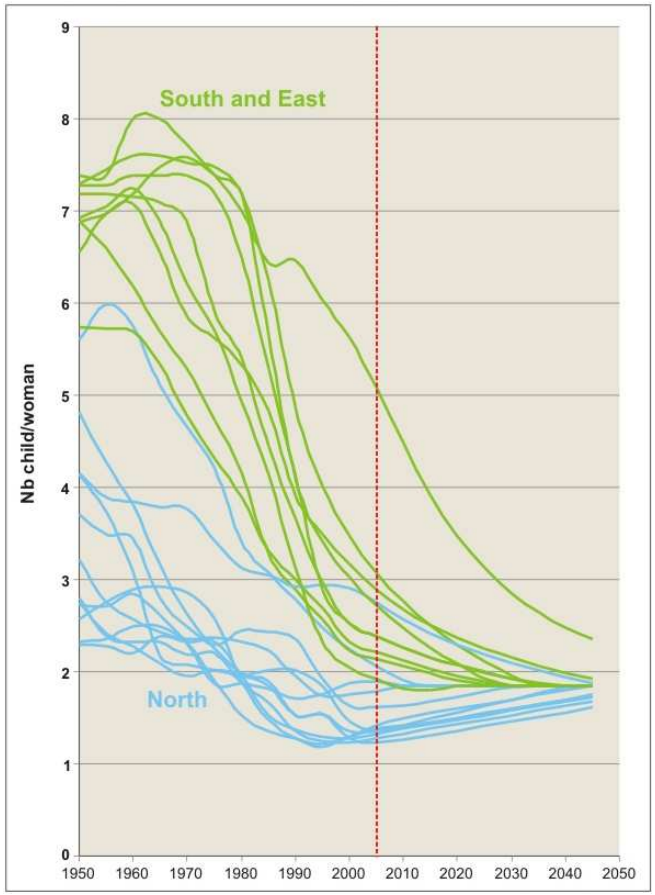
~ 45 million people with no access to sanitation

+100 million Mediterranean people by 2025

Population of Mediterranean countries
(Million inhabitants)

	1970	2000	2025
Northern Med countries	169	193	197
South Eastern Med countries	116	234	**327**
Total Med	285	427	524

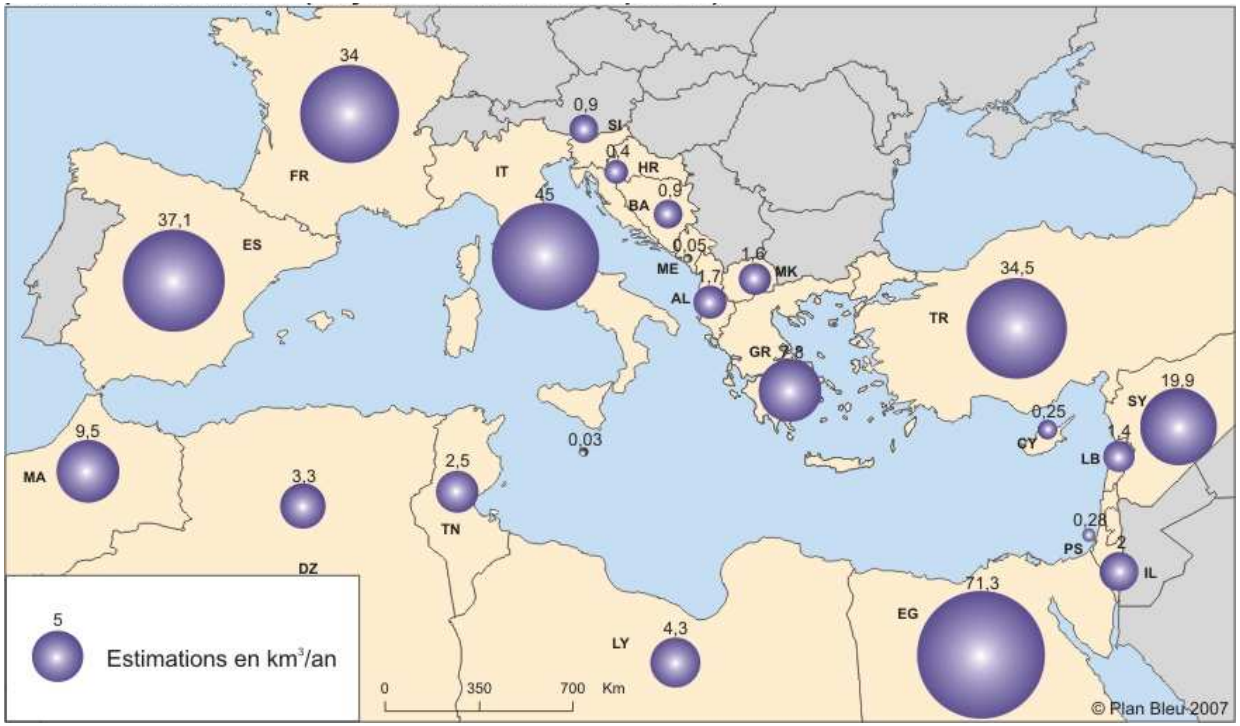
Fecondity index: developments since 1950 and projections



Source: UNDP

Increasing water demand in the South and East

Total water demand in the Mediterranean countries

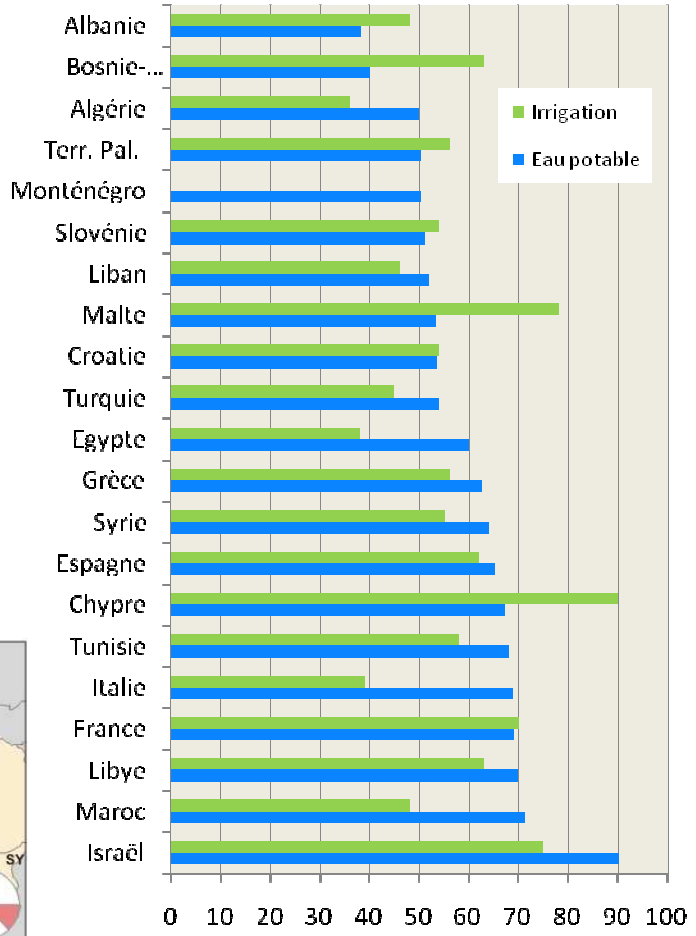


- Water demand has increased twofold during the 2nd half of the XXth century to reach 280 km³/year for all the Med countries
- Agriculture : ~ 65% of total demand (45% North, > 80% South & East)
- High seasonal peaks of drinking water demand (tourism)

Important losses and misuses

Losses & misuses in 2005: ~100 km³/y

i.e. 35% of total water demand

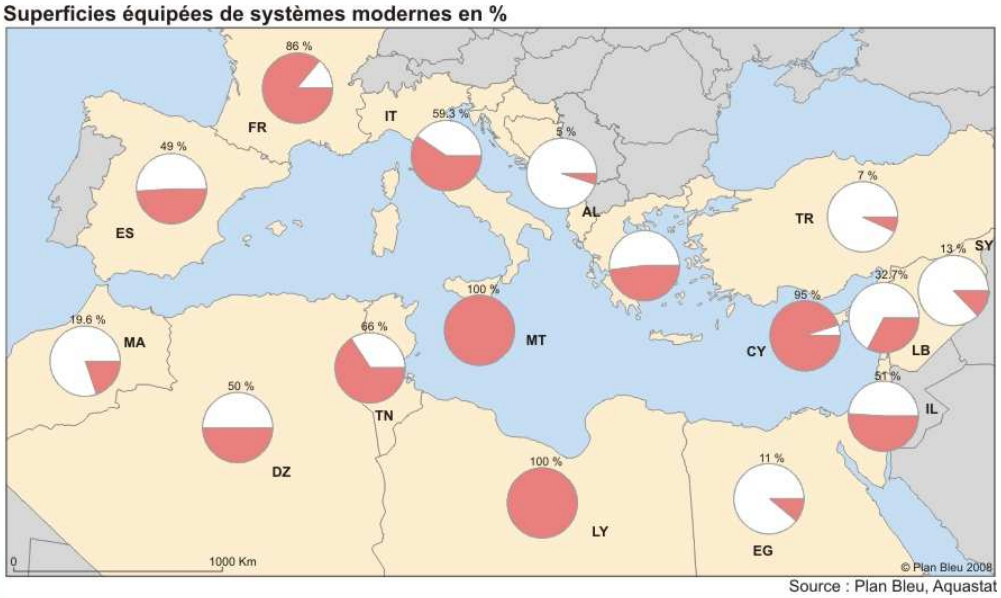


Water efficiency in 2005, national sources

Example for irrigation:

Plot irrigation efficiency: from 45 to 90%

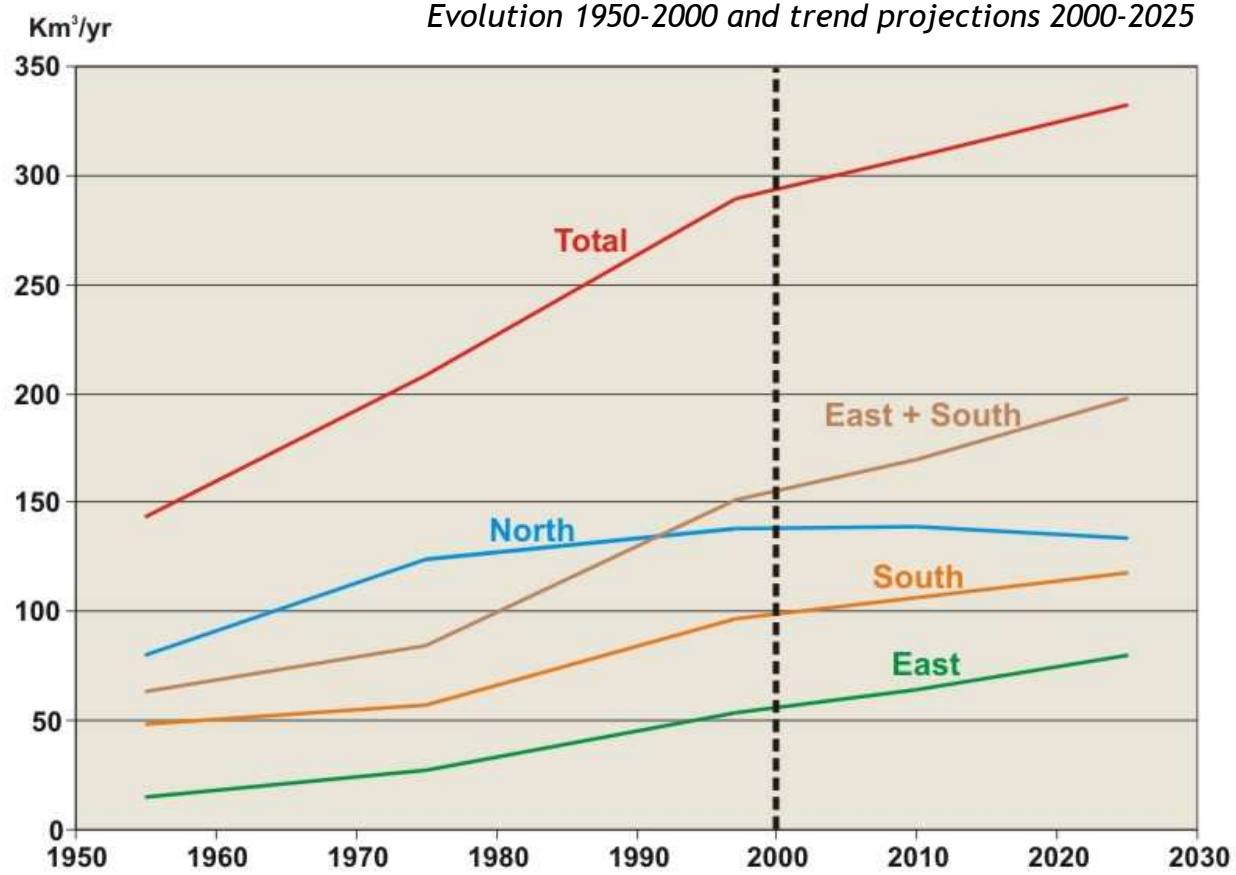
Water demand: from 1500 to > 15 000 m³/ha/yr



Source : Plan Bleu, Aquastat

High increase in water demand by 2025

Total water demand:
Evolution 1950-2000 and trend projections 2000-2025



+ 18% at country scale (330 km³/y by 2025)

+ 25% in the South and East at catchment area level

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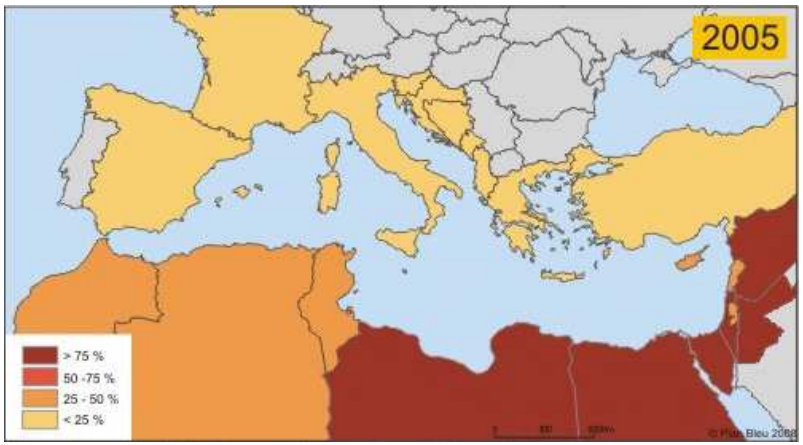
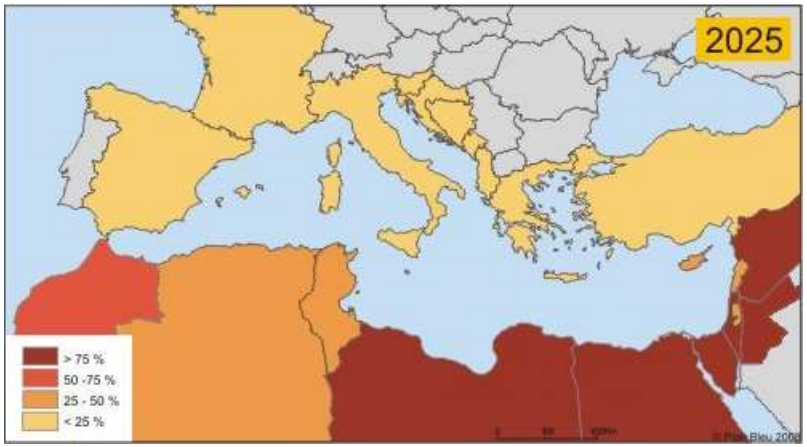
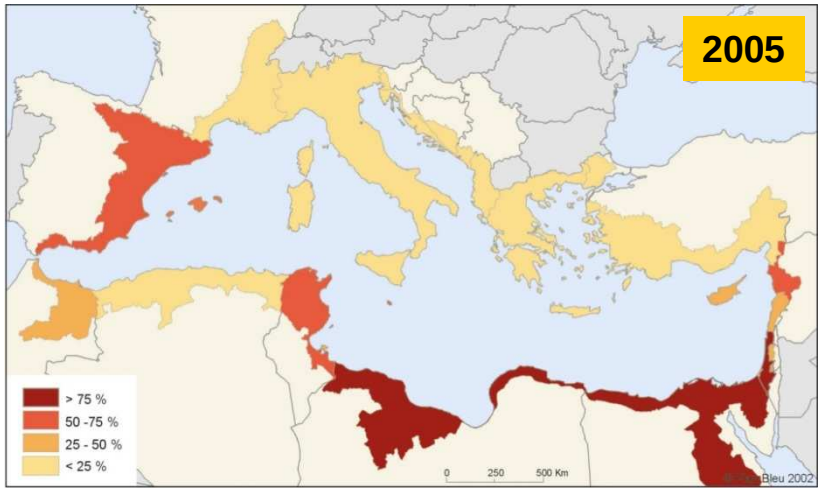
Overexploited resources

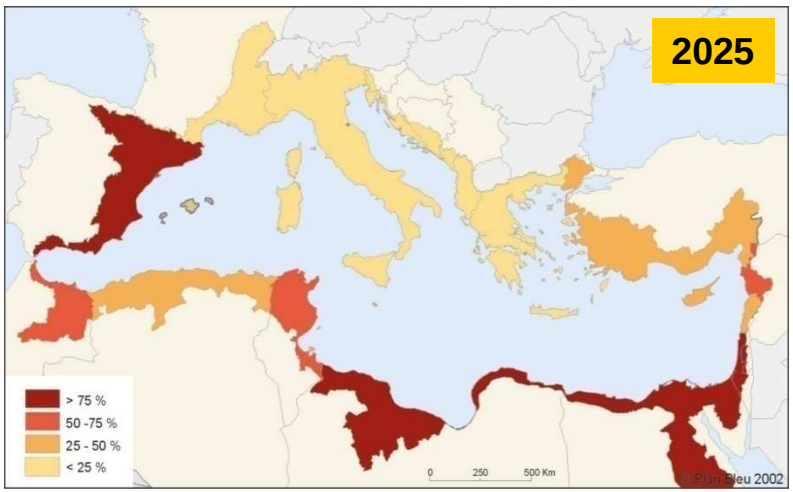
Exploitation index of renewable natural water resources





At national level



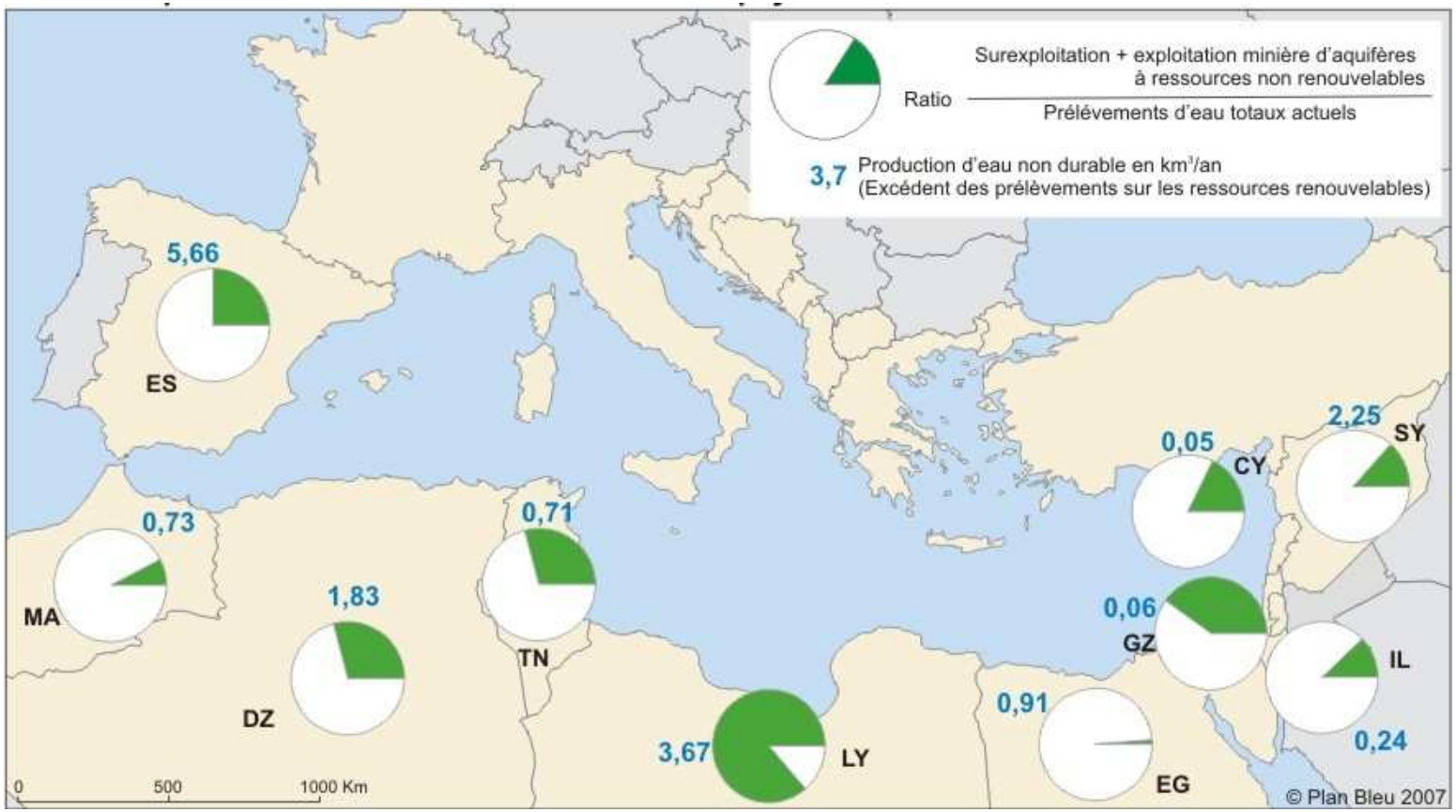


At catchment area level

Non sustainable water production…

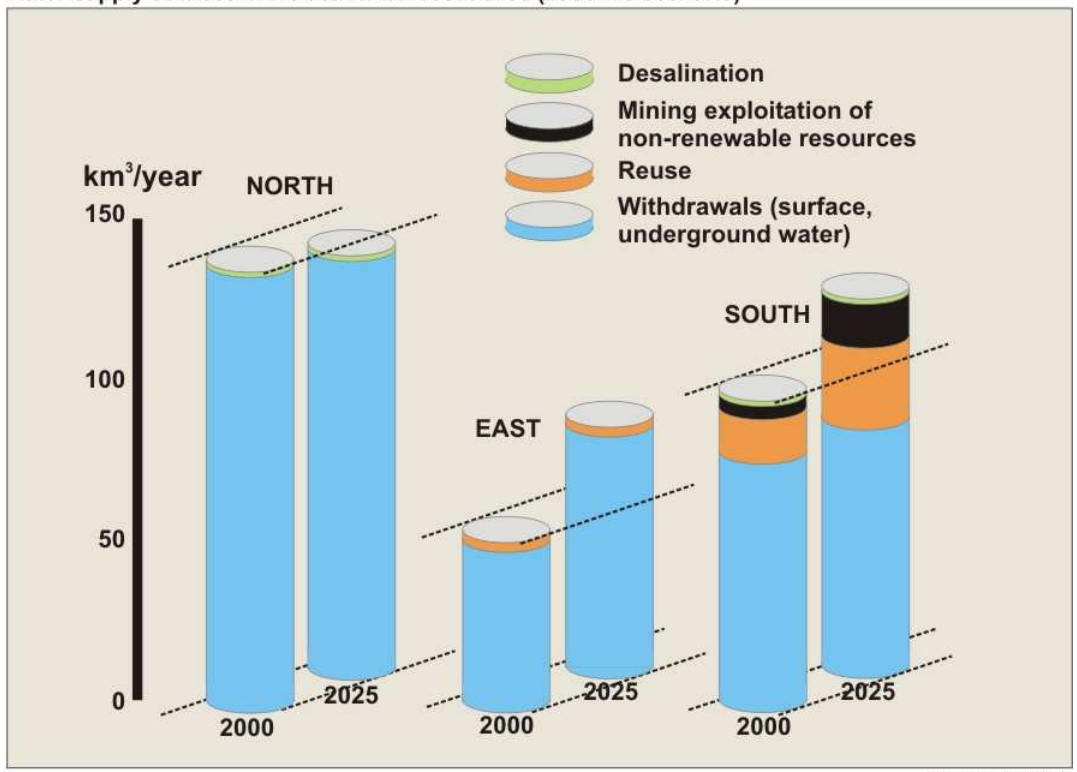
…estimated at 16 km³/y: 66% coming from fossil water withdrawals and 34% from overexploitation of renewable water

Non sustainable water production index



Water policies still too supply-focused

Water supply sources in Mediterranean countries (baseline scenario)



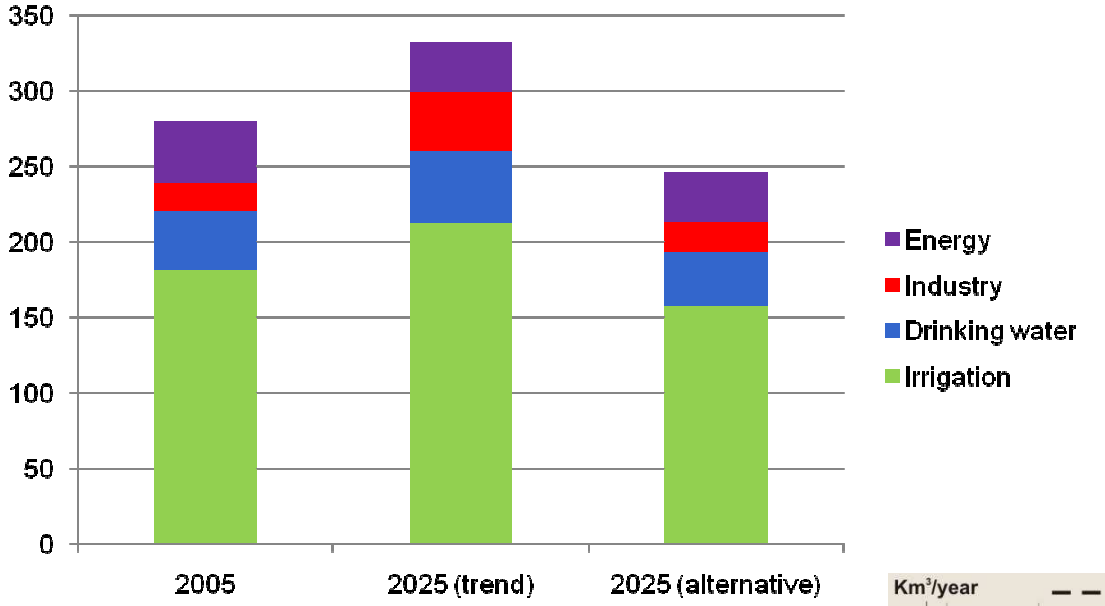
Source : J. margat

Risks in the long term:

- Depletion of some fossil resources
- Destruction of coastal aquifers (seawater intrusion)
- Degraded quality of water & aquatic systems
- Reduced flows & drying-up of wetlands…

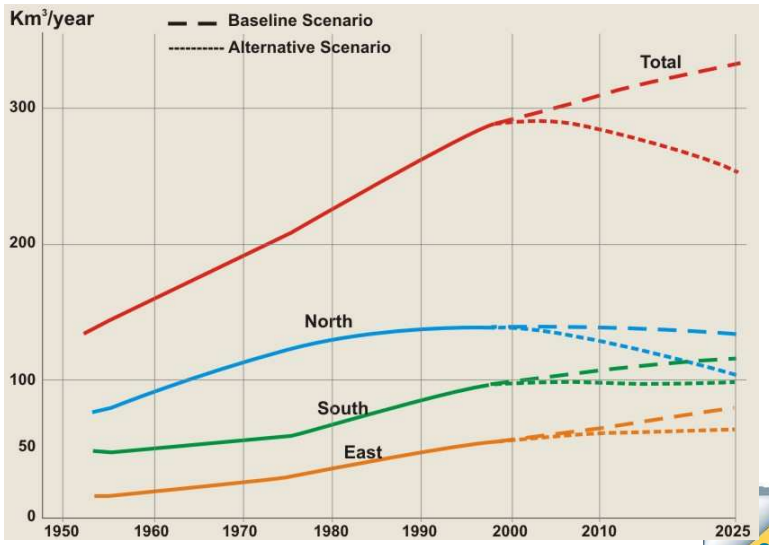
Saving 25% of water demand

Water demand per sector in 2005 & 2025 (trend and alternative scenarios)



Potential water savings in 2025: 85 km³/y

25% of total water demand



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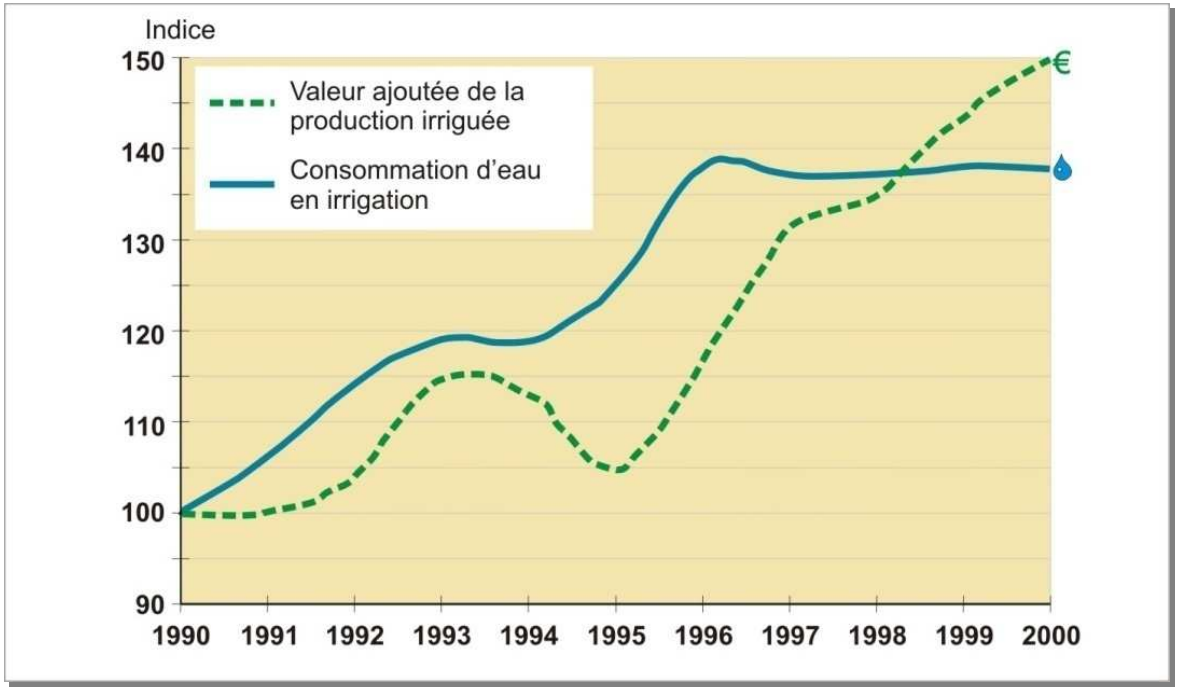
Tunisian national strategy for managing water demand



Water consumption and added value of irrigation, 1990-2000

Source: Hamdane, Plan Bleu, 2002

- National water saving programme for irrigation (1995)
- PISEAU (2001): water savings, pricing, participative approach
- Xth & XIth Plans (2007-2011): mobilisation of new water resources, modernisation of irrigated areas, improving resource management
- Long term: maintenance & modernisation of infrastructures, water demand management, unconventional resources

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Improving resource management

- **Combating pollution**
  - ⇨ Limitating the flows of pollutants and their impacts
  - ⇨ Treating polluting wastewater (sanitation)

- **Increase the exploitable potential in a sustainable way**

  Artificial replenishment of water tables,

  Dividing up regulatory works upstream of catchment areas,

  Water and soil conservation (re-vegetation, cultivation practices, works, biological processes)…

  Objective: ↗ rainwater infiltration and ground storage

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Managing water demand… and not only the supply

- Indispensable policy reforms posting clear integrated water resource management objectives in all policies,
- Strengthening management capacity (local level),
- The role of regional cooperation,
- Water component of the Mediterranean Strategy for Sustainable Development (2005): water efficiency, integrated management of watersheds, achievement of the MDG, promotion of participation & partnership,
- The Union for the Mediterranean & the future Strategy for Water

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