



CREAF

Research and technology transfer
in Terrestrial Ecology

Foto: J. Coello & J. Losarcos

WATER AND GLOBAL CHANGE

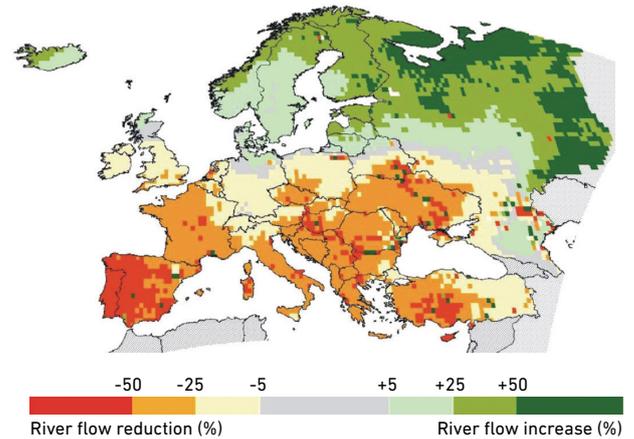
WATER: A SCARCE RESOURCE IN THE MEDITERRANEAN BASIN

The Mediterranean climate is characterized by the fact that the hottest and driest conditions of the year coincide in the same season (summer). Also, the diverse Mediterranean landscape causes very irregular and variable distribution of water, including that needed by natural ecosystems as well as for human activities. Periods of severe drought alternate with periods of intense torrential rains, which actually don't contribute to increasing water availability given that most of that water runs over the surface (not infiltrating into the soil), eventually ending up in the sea.

WE CANNOT CONTINUE TO CREATE MORE DEMAND THAN SUPPLY

Recent changes in land use have increased water demand in the Mediterranean region above actual supply. On one hand, the abandonment of agricultural areas in the 1960s increased the surface area occupied by young, dense forests, which consume a large amount of water through evapotranspiration. Paradoxically, at the same time the irrigated agricultural area has grown. Additionally, water demand associated with most other human activities has grown too. The result: many of our rivers don't even meet minimum ecological flows requirements, and they can't satisfy the variety of current demands.

River flow evolution in Europe predicted for 2070, following ECHAM4 Global Climate Model projections.



WITH GLOBAL CHANGE THERE WILL BE EVEN LESS WATER AVAILABLE

Experts in global change forecast an especially severe increase in temperatures in the Mediterranean area, and though they can't assure that it will rain less, they expect a decrease in those precipitations which are effective in increasing water availability. This is because the precipitation regime will change to the effect that droughts and torrential rains will be more extreme and more frequent. As a consequence, the minimum flows of rivers will decrease, along with our ability to use the water that they transport. If together we are not able to conceive policies and strategies for management of this vital resource that promote conservation and compatible uses, the risk of social conflict could escalate, having unpredictable consequences.

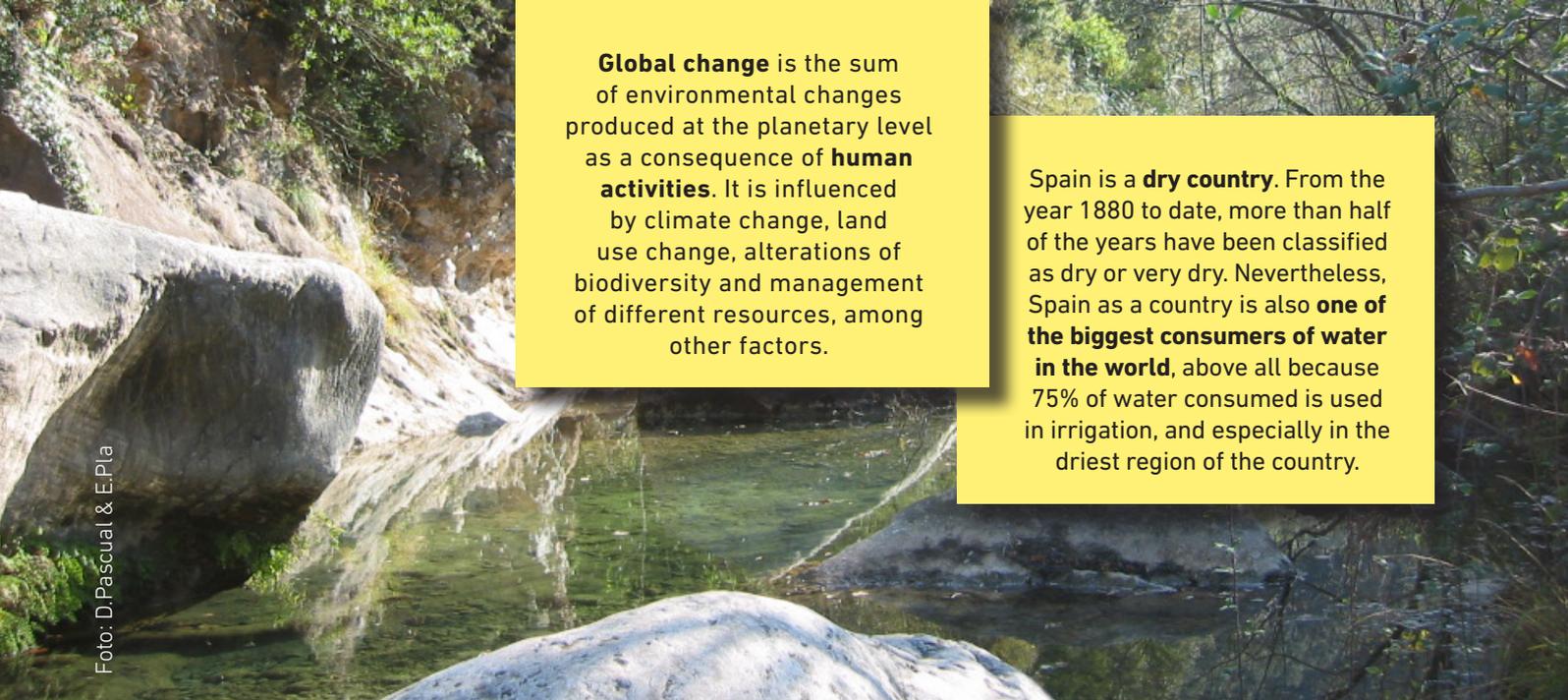


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Global change is the sum of environmental changes produced at the planetary level as a consequence of **human activities**. It is influenced by climate change, land use change, alterations of biodiversity and management of different resources, among other factors.

Spain is a **dry country**. From the year 1880 to date, more than half of the years have been classified as dry or very dry. Nevertheless, Spain as a country is also **one of the biggest consumers of water in the world**, above all because 75% of water consumed is used in irrigation, and especially in the driest region of the country.

■ AT CREAM WE HAVE SIX MAIN LINES OF WORK RELATED TO WATER AND GLOBAL CHANGE

- 1 Global change and its impact on water resources.** We study the effects of increased temperatures and changes in the cycle of precipitations on water availability for ecosystems and human activities.
- 2 Land use and its interaction with water demand and availability.** We analyze the role of land use and its recent changes in the availability of water resources.
- 3 A multidisciplinary and integrated approach to water use.** We calculate the water balance between inputs from the atmosphere and consumption, including the role of natural systems in the analysis.
- 4 Identification of social and territorial vulnerabilities.** We analyze what human activities and ecosystems in the territory run the greatest risk due to global change's impacts on water resources.
- 5 Design of adaptation measures.** We design strategies and adaptation measures for global change's effects on the availability of water resources, with attention to ecosystem and social vulnerabilities.
- 6 Participative processes for the design of management and planning strategies.** We have experience in social participation and science-society dialog in water-related themes. This is an essential factor for guaranteeing effective application of planned measures.

■ CREAM'S PROJECTS ON WATER AND GLOBAL CHANGE

- FP7 BeWater: Adapting society to global change using participative processes. www.bewaterproject.eu
- Life + MEDACC: Adapting the Mediterranean to climate change using modeling and demonstrative actions. www.medacc-life.eu
- ACCUA: Evaluation of the effects of global change on water availability in three catchments in Catalonia and design of adaptation strategies and measures. <http://www.cream.cat/accua/>

■ PLATFORM PARTICIPATION

- European Innovation Partnership on Water. <http://ec.europa.eu/environment/water/innovationpartnership/>
- European Water Platform (WssTP). <http://wsstp.eu/>

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