



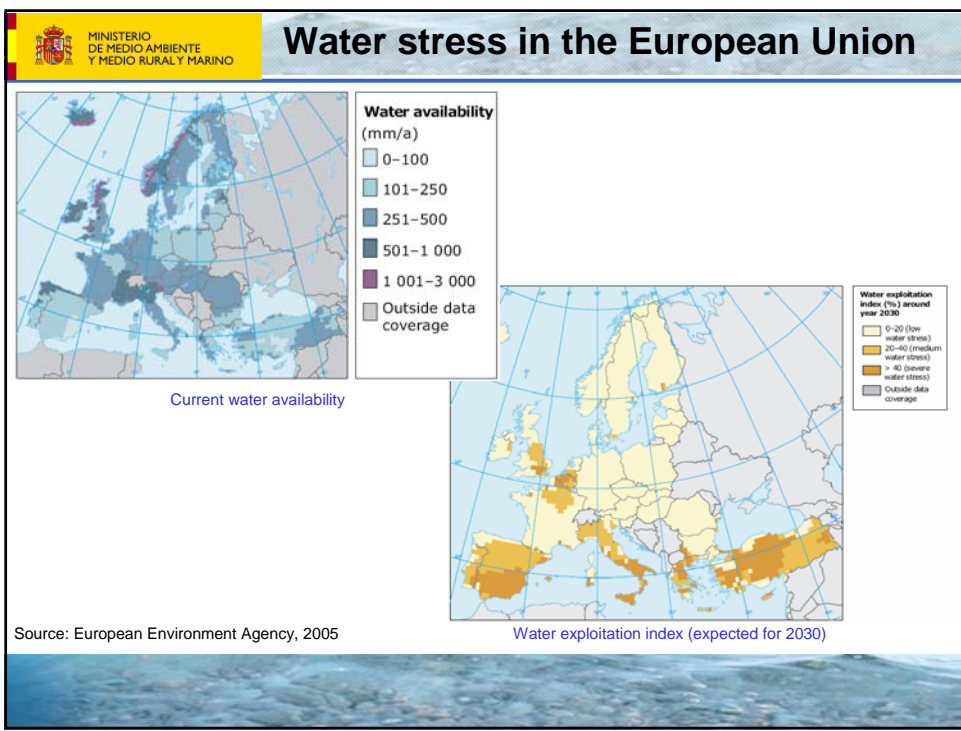
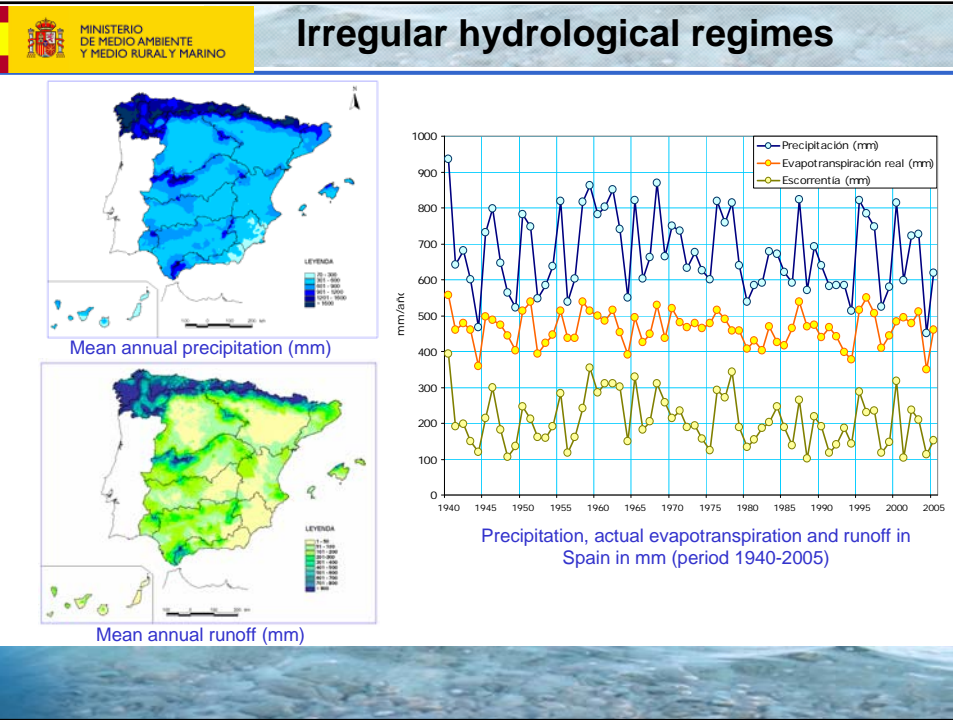
The management of water scarcity, droughts and climate change in Spain



Teodoro Estrela
Deputy Water Director,
Spain



Water scarcity





Droughts



Policy bases for Drought Management Plans

Law 10/2001, July 5, of the Hydrological Water Plan, establishes the bases for the drought planned management.

Article 27. Drought management

Section 1. The Ministry of Environment, for dependent river basins, in order to minimize environmental, economic and social impacts of eventual drought situations, will establish a national hydrologic indicator system that will allow foreseeing these situations, and will serve as general reference for river basin authorities for the formal declaration of emergency situations and eventual drought. This declaration will imply the entry into force of Drought Management Plans (DMP).

Section 2. Basin Organizations will develop Drought Management Plans (DMP) for alert situations and eventual drought (exploitation rules and measures)



DMPs general characteristics

Entities in charge: River Basin Authorities

Objective: minimize environmental, social and economic impacts of drought situations

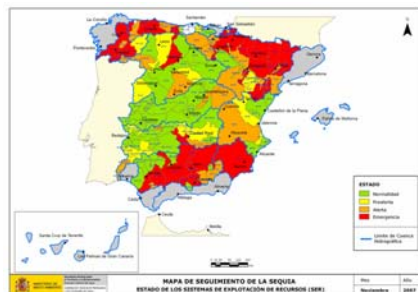
Contents: includes diagnosis of situation (historical droughts, vulnerability of basin), indicators system (precipitation, river inflows in natural regime, stored volume in surface reservoirs, water levels in aquifers), programme of measures to be applied in each drought phase according to the drought status, management and follow-up system.

Approval: River Basin Drought Management Plans were approved by Ministerial Order in March 2007



National hydrological indicator system

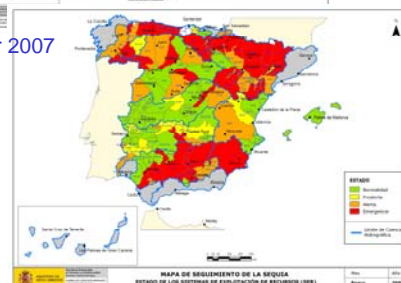
- National Hydrological indicator system has been developed
- Drought maps being developed since December 2005 and published in the web page of Spanish Ministry of Environment, Rural and Marine Affairs.



november 2007

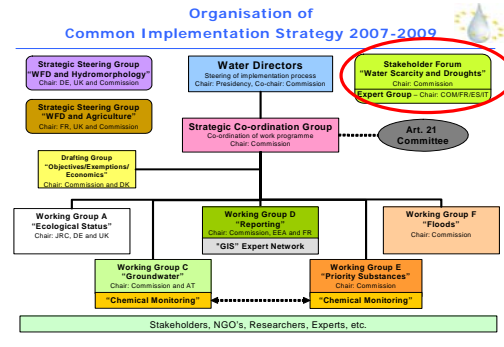


december 2007



january 2007

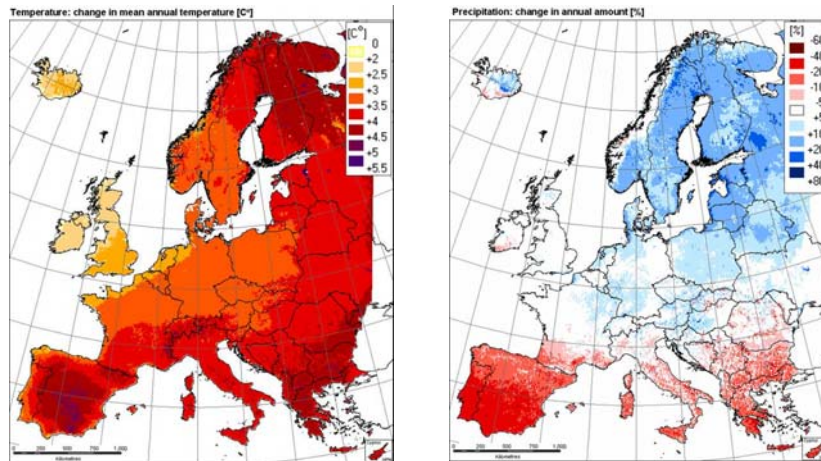
- Leading jointly with France and Italy the **WS&D Expert Network** of CIS
- Led the development of the **Drought Management Plans Report**, endorsed by EU Water Directors in November 2007



Climate change

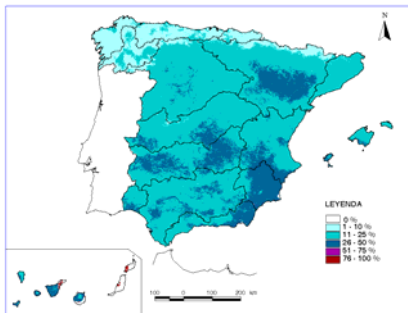
Impact of Climate Change

EC Green Paper. A2 scenarios. Climatic changes foreseen for 2071-2100

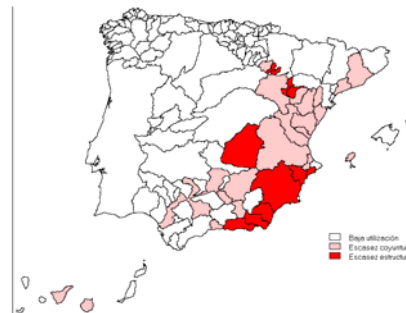


Change in mean annual temperature and precipitation

Impact on water resources and vulnerability



Impact on runoff reduction for a decrease of 5% in mean annual precipitation and an increase of 1°C in mean annual temperature (year 2030)



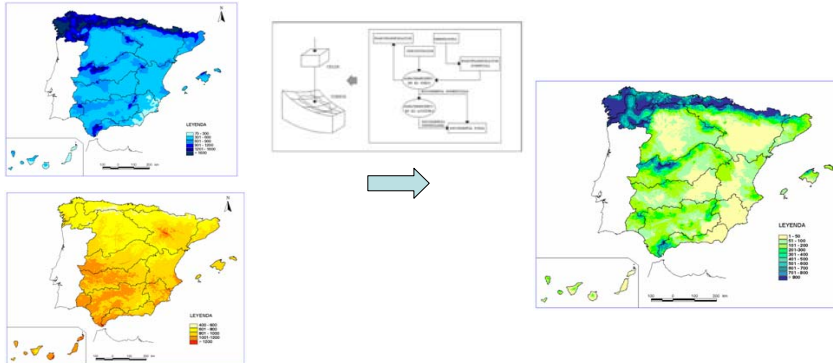
Vulnerability: water scarcity risk in water resource systems

Source: White Paper on Water in Spain, MMA (2000)



Climate Change

- National Adaptation Plan on Climate Change. Aim: Adaptation to climate change into the planning strategy of the different socio-economic sectors in Spain
- Water resources sector: assessment of impacts on natural resources, water demands, available resources and ecological status



Climate Change

- Royal Decree, RD 907/2007 regarding River Basin Management Plan Regulations was approved in July 2007.
- Mandatory to consider the effects of climate change on water resources and in the development of plans.