



**Organization for Security and Co-operation in Europe  
Secretariat**

PC.DEL/306/07

3 April 2007

ENGLISH only

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## **Conference Services**

Please find attached "*Spanish Drought Management Plans Early Warning Systems National Drought Observatory*" by Dr Teodoro Estrela Monreal, Deputy Water Director Spanish Ministry of Environment, delivered to Session 5 of the Second Preparatory Conference to the 15<sup>th</sup> OSCE Economic and Environmental Forum "Key challenges to ensure environmental security and sustainable development in the OSCE area: Water Management", held in Zaragoza, Spain, 12 - 13 March 2007.

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**Spanish Drought Management Plans  
Early Warning Systems  
National Drought Observatory**  
Second Preparatory Conference  
to the 15th OSCE Economic and Environmental Forum  
Tuesday, 13 March 2007

Dr Teodoro Estrela Monreal  
Deputy Water Director  
Spanish Ministry of Environment

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**Drought Management Plans**

1. Legal Framework
2. Drought Management Plans (DMPs)

## **Management alternatives for droughts**

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a) As emergency situation

Considering it as a crisis situation, which has to be tackled using extraordinary resources.

b) Within the general planning framework

Making an analysis of the existing risk, and introducing droughts in the general planning strategies as a different scenario.

**In Spain, traditionally, droughts have been managed as emergency situations.**

## **Drought management as emergency situation**

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Spanish Water Law (TRLA), in **art. 58**, foresees in extraordinary drought situation the adoption, by the Government, of necessary measures to overcome these situations, related to the use of the public water domain.

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**Decrees of urgent extraordinary measures**

## Bases for drought planned management

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 the intercommunitary basins, in order to minimize environmental, economic and social impacts of eventual drought situation, will establish a **global hydrologic indicators system** that will **allow foreseeing these situations**, and will serve as general reference for river basin organizations for the **formal declaration of emergency situations and eventual drought**. This declaration will imply the entry into force of the Special Plan (DMP) referred in the following section.

## Bases for drought planned management

### Hydrological National Plan Article 27. Drought management

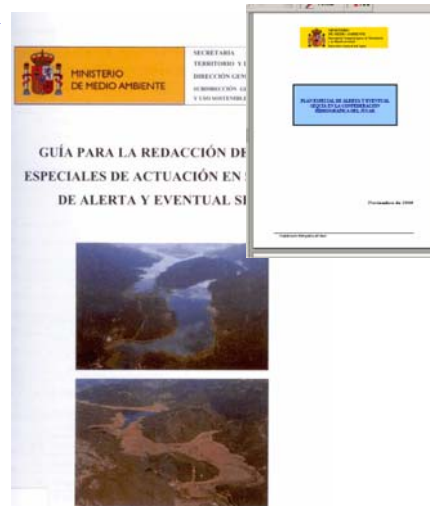
Section 2. **Basin Organizations** will develop (in 2 years) **special action plans (DMP)** for alert situations and **eventual drought** (exploitation rules and measures)

### Hydrological National Plan Article 27. Drought Management

Section 3. **Public Administrations responsible for public urban supplying**, for town of or above **20,000 inhabitants**, will provide: **Emergency Plan for drought** situations (taking into account rules and measures planned in Special Plans) to be applied within four years.

## Drought Management Plans (DMPs)

- Water Directorate elaborated a Guide Document for developing DMP
- Each river basin developed a plan
- Plans went through public consultation process (Official State Bulletin)
- Will be launched on March 22nd



## DMPs

**ENTITIES IN CHARGED:** River Basin Authorities

**LEGAL FRAMWORK:** Law 10/2001, of the Hydrological National Plan and Directive 2000/60/CE – Art. 4.6-

**OBJECTIVE:** Minimize environmental, social and economic impacts of drought situations

**PLACEMENT WITHIN THE PLANNING PROCESS:** It's a specific plan within the River Basin Management Plans.

# DMPs

## SUMMARY OF THEIR CONTENT

### DIAGNOSIS:

- Identify and characterize territorial and environmental elements. Zonification
- Analysis of historical droughts and drought characterization
- Definition of indicators, thresholds and drought phases

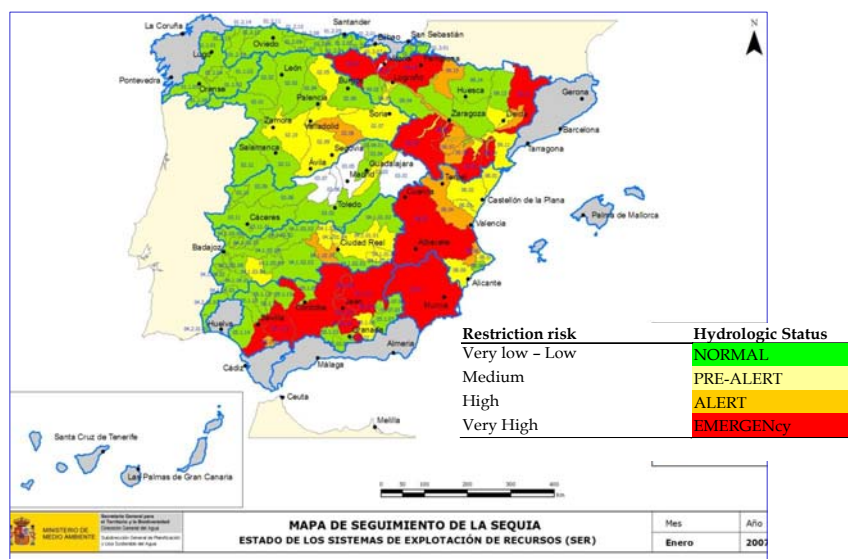
### PROGRAM OF MEASURES (POM):

- Definition of general measures and specific ones for each area in each drought phase

### MANAGEMENT AND FOLLOW-UP SYSTEM:

- Organization and management systems
- Definition of indicators for the implementation follow-up and effects

## Status of water resource systems in Jan. 2007

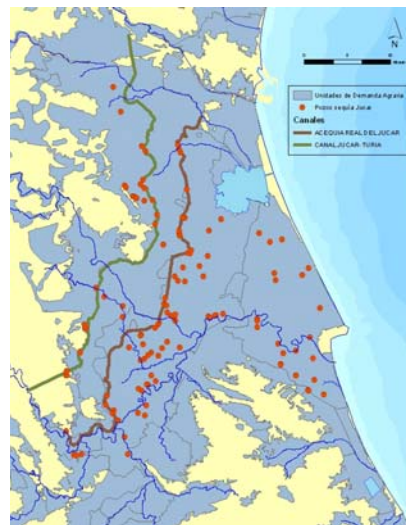


## Mitigation drought measures

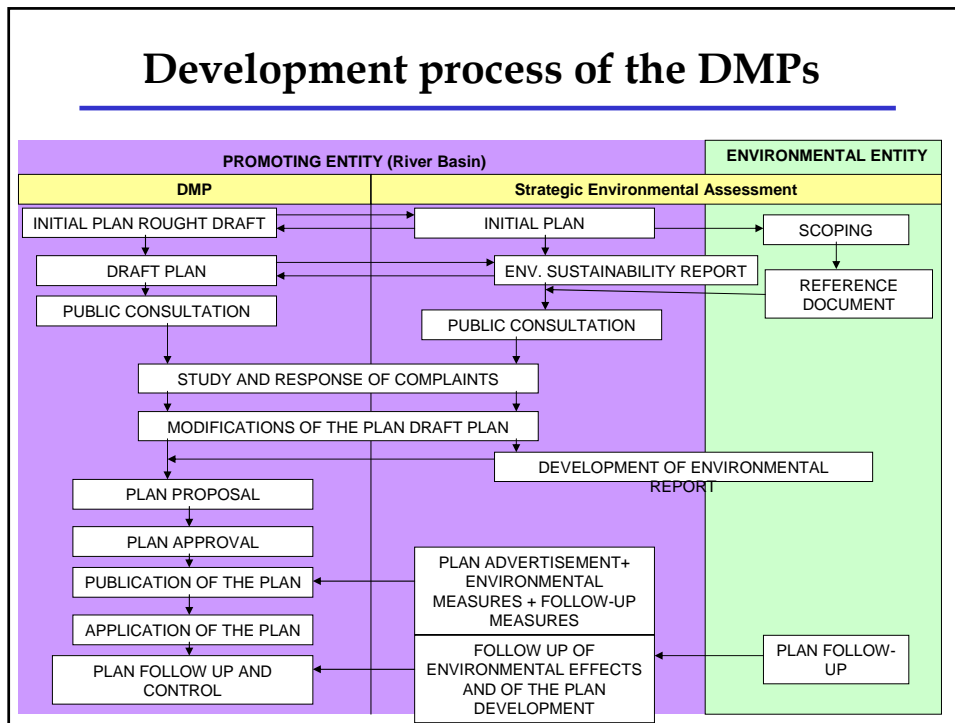
TYPES OF MITIGATION MEASURES							
Indicator	1-0.5	0.5-0.4	0.4-0.3	0.3-0.2	0.2-0.15	0.15-0.1	0.1-0
Status	Normal	Pre-alert		Alert		Emergency	
Objective	Planning	Information-control		Conservation		Restrictions	
Type of measure	Strategic			Tactics		Emergency	

## Main measures to apply during drought situation

- Management rules, savings and use restrictions
- Joint management of surface water and groundwater: drought wells
- Non-conventional resources: reuse of treated wastewaters in agriculture
- Water markets



## Development process of the DMPs



## Early warning systems

### Automatic Hydrological Information System (SAIH)



## Objectives and design criteria

### OBJECTIVES:

#### Direct:

- flood alert
- water resource management
- dam security

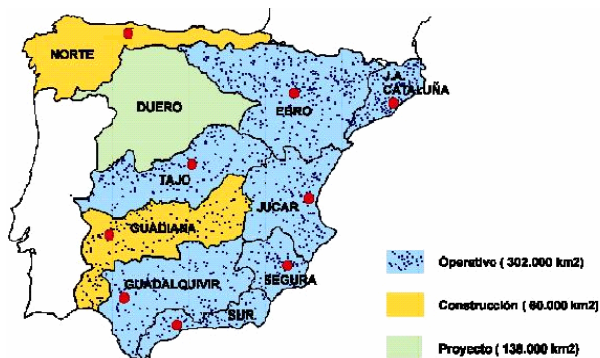
#### Indirect:

- processes modernization
- hydrological database improvement

### DESIGN CRITERIA:

- descentrilised (country) – centralised (basin)
- automatic
- real time
- maximum prevention

## SAIH Networks



1595 Control stations

#### Main types :

322 Dams  
388 River stations  
224 Channel stations  
416 Pluviometers  
245 Radio transmitters

## Elements of the system



Pluviometer



Channel control station



River control station



Radio transmitter



Control centre



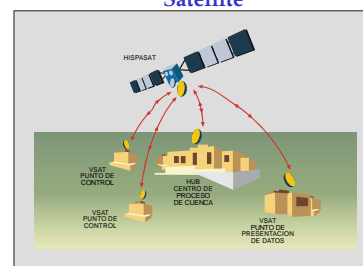
VSat

## Basic communication network scheme

### Terrestrial radio



### Satellite



### FUNCTIONS

- Data gathering : Sensors
- Data transfer : Telecommunication networks
- Data processing: Processing centers
- Support from models for decision making

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# National drought observatory (ONS)

## National drought observatory (ONS)

The screenshot displays the website for the National Drought Observatory (ONS). At the top, there is a navigation bar with the text "Bienvenidos | Benvinguts | Ongi Etorri | Benvidos | Benvinguts | Bienvenus | Welcome" and several menu items: "Press and Communications", "National Parks", "Water and Environment", and "Meteorology". Below this is the logo of the "MINISTERIO DE MEDIO AMBIENTE" and the "Observatorio Nacional de la Sequía". The main content area features a large image of a dry, cracked landscape with the text "www.mma.es" and "Observatorio Nacional de la Sequía". To the left of the main content is a vertical menu with various links such as "N.D.O. Menu", "News and press releases", "What is drought?", "Drought in Spain", "The status of resources", "Map and monitoring report", "Measures set up", "Commissions with users and experts", "Public environmental education", "Agriculture risk management", "Emergency works", and "Contact the National Drought Observatory (ONS)". To the right of the main content is a vertical list of "AREAS" including "Environmental Quality", "Coasts", "Hydric Resources", "Basin Agencies and others", "Nature Conservation", "Water Companies", "National Parks", "Climatic Change", and "Public Domain". At the bottom of the page, there is a "Novedades" section with the text "Encuentro Mediterráneo, Agua y Sequías (Madrid-Zaragoza)" and a brief description of the observatory's mission.

MINISTERIO DE MEDIO AMBIENTE

Bienvenidos | Benvinguts | Ongi Etorri | Benvidos | Benvinguts | Bienvenus | Welcome

Press and Communications | National Parks | Water and Environment | Meteorology

Observatorio Nacional de la Sequía

Recursos Hídricos | Observatorio Nacional de la Sequía

AREAS

- Environmental Quality
- Coasts
- Hydric Resources
- Basin Agencies and others
- Nature Conservation
- Water Companies
- National Parks
- Climatic Change
- Public Domain

www.mma.es

Observatorio Nacional de la Sequía

Novedades: Encuentro Mediterráneo, Agua y Sequías (Madrid-Zaragoza)

El Observatorio Nacional de la Sequía (ONS) es una iniciativa del Ministerio de Medio Ambiente y del Ministerio de Agricultura, Pesca y Alimentación que pretende aglutinar a todas las administraciones hidráulicas españolas con competencias en materia de

# Contents

- News, drought episodes in Spain, links to other experiences (Portugal, France)
- Broad information on water resources: precipitation, snow levels, surface, groundwater, wetlands... (links to the meteorological institutes, bulletins and reports)
- Maps and monitoring reports
- Information on legislation and international agreements
- Experts and technical commissions meetings
- Environmental education and public participation activities
- Agricultural risk management information
- Emergency works



Contact: [ons@mma.es](mailto:ons@mma.es)

Contents on Ministry's Web site:  
<http://www.mma.es/>



## Conclusions

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- Drought Management Plans: essential for water allocation, establish priorities under extreme situation, avoid social conflicts
  - Urban supply plans: ensure population access to quality water resources
  - Control sewage and water treatment: essential for public security
- Early-warning systems: avoid extreme phenomena emergencies (human and economic losses), allow planning measures, establish communication with civil protection services
- Drought observatory: appropriate tool for public availability information (monthly reports, and real time data)