

JÚCAR RIVER BASIN AUTHORITY
HYDROLOGICAL PLANNING DEPARTMENT

*Experiences in the Júcar River Basin
Droughts*

Juan J. Moragues

Júcar River Basin Authority

President

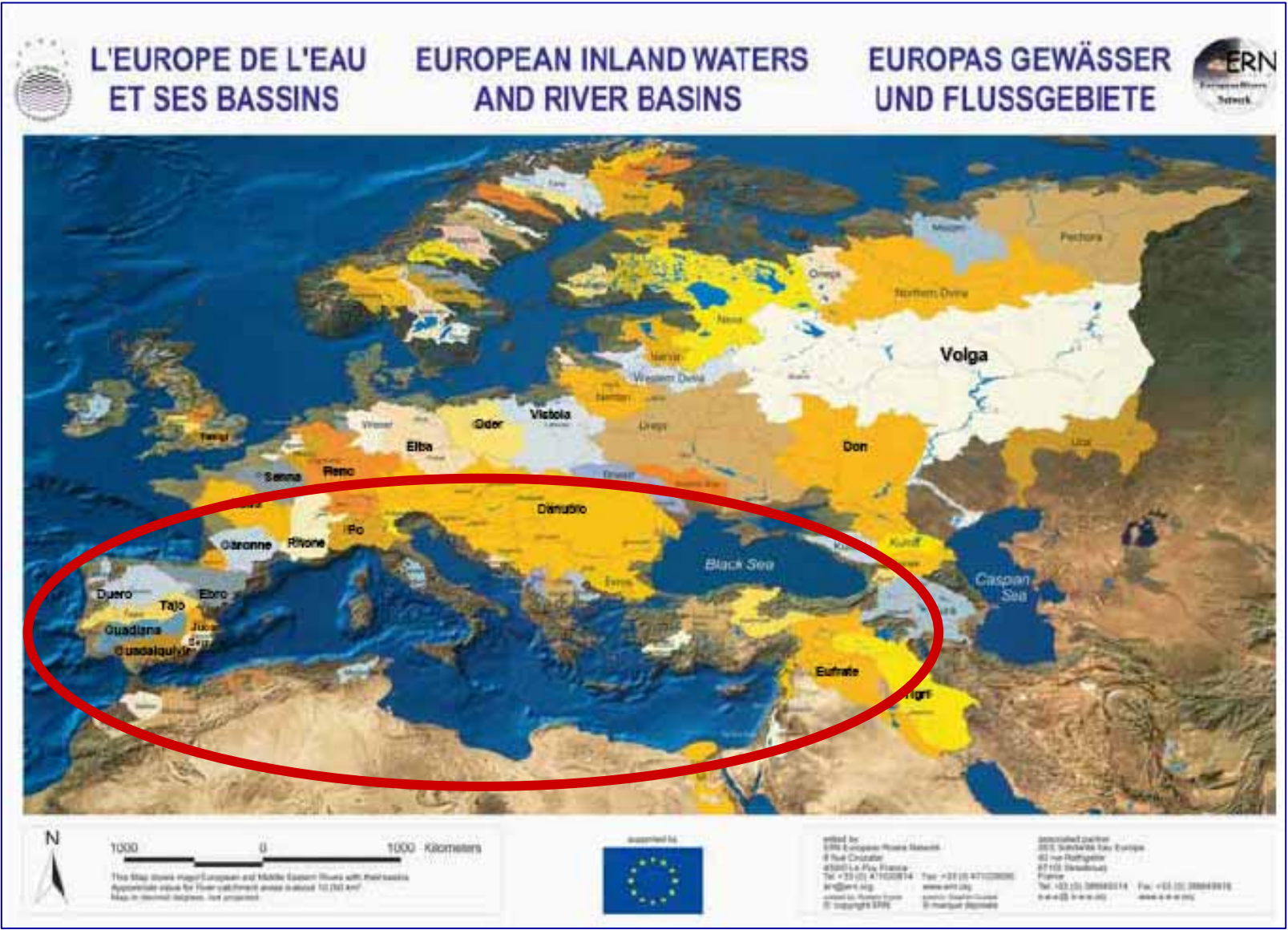
Moscow, 5 June 2008

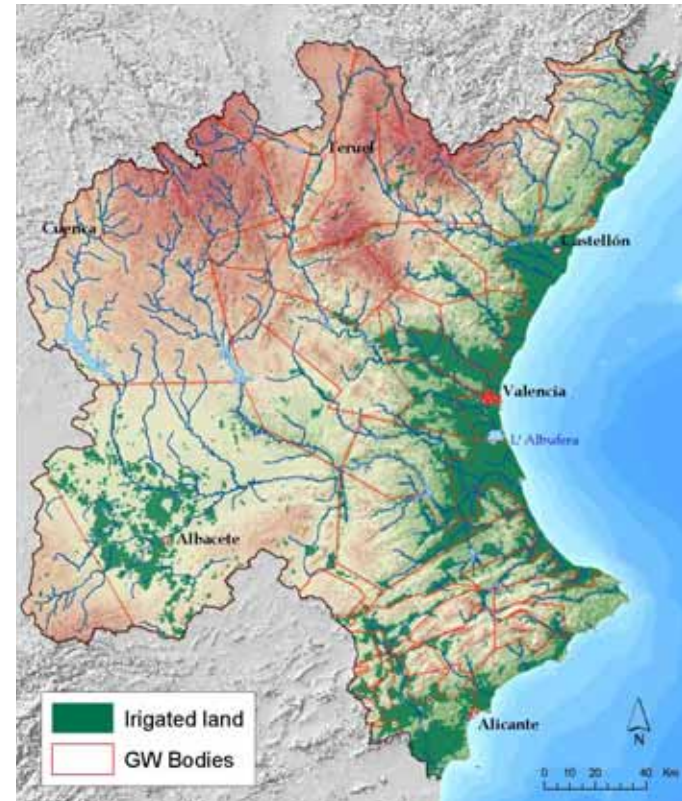
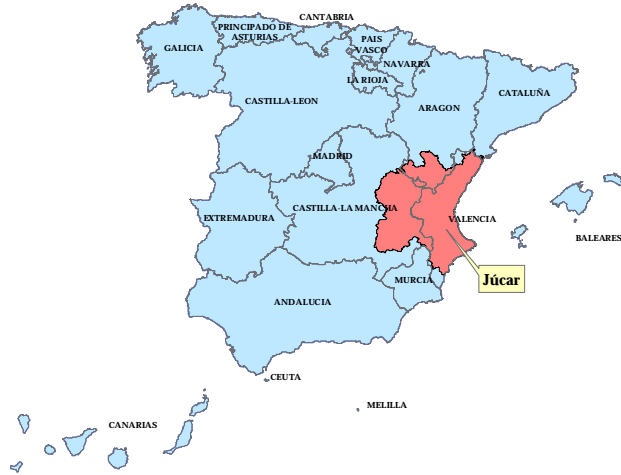
Ramiro Martinez

MENBO : Mediterranean Network of Basin Organisations

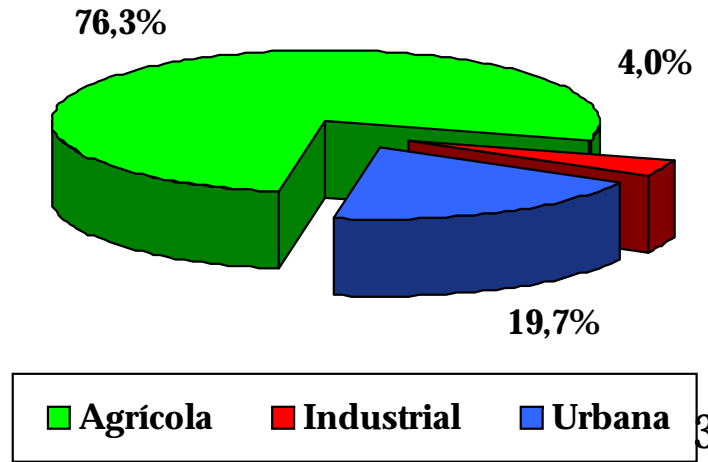
REMOC : Red Mediterranea de Organismos de Cuenca

REMOB : Reseau Mediterranéen des Organismes de Bassin



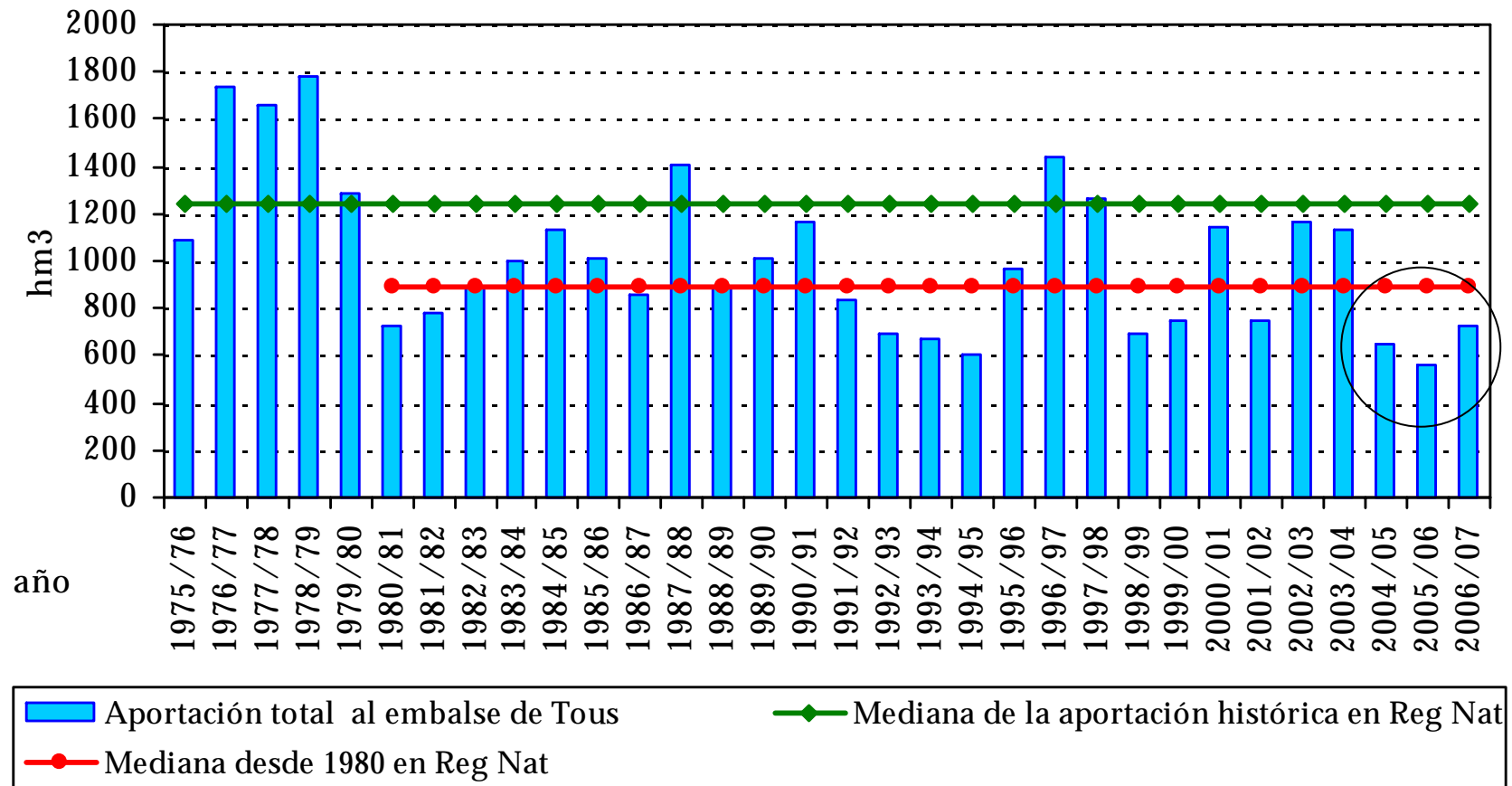


Area (km ²)	43 000
Population (inhabitants)	4 360 000
Equivalent population due to tourism (inhabitants)	1 400 000
Irrigated surface (ha)	370 000
Water demand (hm ³ /year)	3 600
Water resources (hm ³ /year)	3 200
Water resources origin	Superficial runoff 25% Groundwater Recharge 75%



Three consecutive years of intense drought

Annual natural inflows into the Tous reservoir



Year 2005/06 minimum historical from 1940/41

Júcar Drought Commission



Composition of the Commission: RD 1265/2005

Delegated administrative entity of the Council of Government for the follow-up and management of droughts

Take part and vote (13)

- Chairing: President of the Júcar River Basin Authority (C.H.J.)
- C.H.J (3) : Commissary, Technical Director, Head of the Hydrological Planning Department
- Ministries (2): Industry & Environment, Marine and Rural Affairs
- Autonomous Communities (4)
- Users (3):
 - Municipal Council of Valencia
 - Royal Supply Channel of the Júcar (Acequia Real)
 - Iberdrola, S.A.

Take part without vote (4)

- Defending environmental interests: Agró
- Industrial representatives: AVA
- Representatives trade union: CCOO
- Local entities from Albacete

Special Action Plan for drought situations

Special Action Plan for alert and eventual drought situation

Approved by the National Government:

ORDER MAM/698/2007, 21 March, by which special action plans for alert and eventual drought situation are approved within hydrological plans for intercommunity basins.

Official web site www.chj.es

Confederación Hidrográfica del Júcar - Microsoft Internet Explorer

Archivo Edición Ver Favoritos Herramientas Ayuda

Atrás Búsqueda Favoritos

Dirección <http://www.chj.es/>

 MINISTERIO DE MEDIO AMBIENTE
 CONFEDERACIÓN HIDROGRÁFICA DEL JÚCAR
Adecuación ambiental y drenaje de la cuenca del POYO vertiente a la Albufera




Inicio Organismo Cuenca Comisaría de Aguas Dirección Técnica Secretaría General Oficina Planificación Hidrológica

Documento de referencia

Descripción	Fecha	Formato	Tamaño en bytes
<ul style="list-style-type: none"> Plan especial de alerta y eventual sequía (Memoria) 	Mar/2007	PDF	5.847.299
<ul style="list-style-type: none"> Plan especial de alerta y eventual sequía (Anejos) 	Mar/2007	PDF	2.109.039

NOVEDADES

Oferta Pública Adquisición Derechos de Agua

Seguimiento de sequías

Redes de

What is it?

Special Action Plan for drought situations

From



to



Mitigation measures:

Too late

Too cost

High Drought impact

Preventive measures

Alert system

Mitigate the impacts

*Act 10/2001, National
Hydrological Plan*

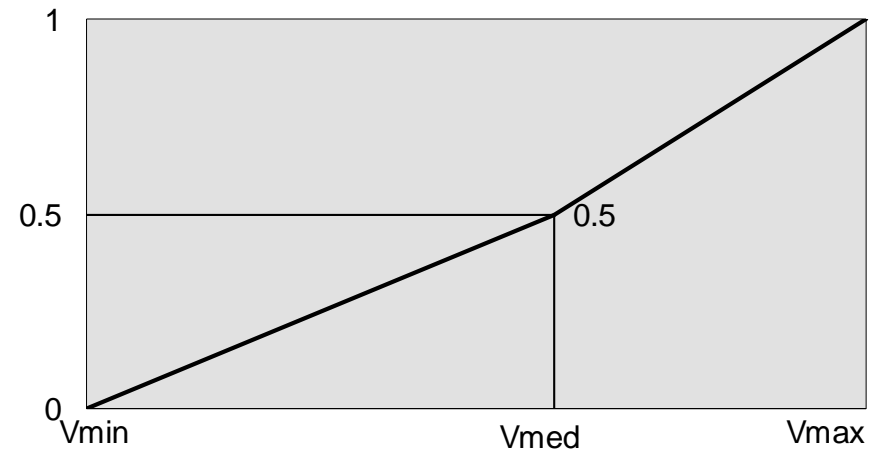
Main elements in the Special Drought Plans

- **OBJECTIVE:** To minimise environmental, economical and social impacts of drought situations.
- **DIAGNOSIS:**
 - Characterisation of territorial and environmental elements.
 - Analysis and characterisation of historical droughts.
 - Definition of **indicators**, threshold and drought periods.
- **PROGRAMME OF MEASURES:**
 - Definition of measures for each zone in every drought period.
- **MANAGEMENT SYSTEM:**
 - Organisation and management system: **Permanent Commission**.
- **ENVIRONMENTAL COMPATIBILITY**

Indicator Evaluation and Threshold Definition

Identify areas of origin of the water resource associated to the most significant demand units and selection of representative indicators:

- Pluviometry
- River discharge
- Stored volume in dams
- Piezometric levels in aquifers



Status Index Value	Status
0,75 – 1,00	NORMAL
0,50 – 0,75	
0,30 – 0,50	PREALERT
0,15 – 0,30	ALERT
0,00 – 0,15	EMERGENCY

Drought indicators CHJ (31 March 2008). SCENARIOS

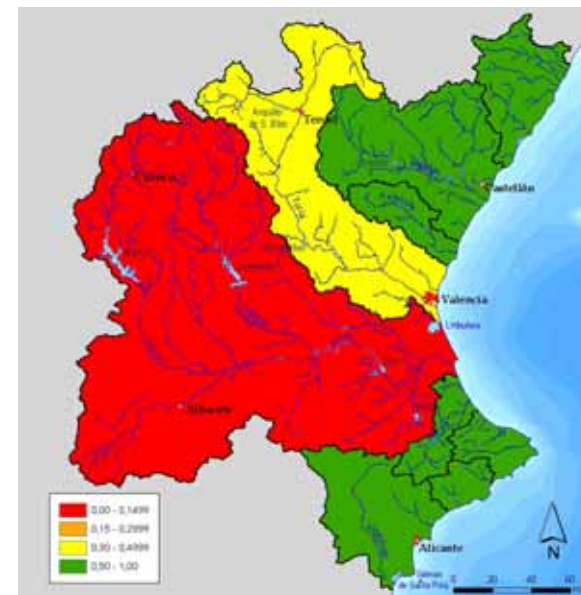
System	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Cenia-Maestrazgo	0,67	0,63	0,61	0,64	0,7	0,59	0,74	0,69	0,66	0,66
MijaresPlana de Castellón	0,66	0,66	0,65	0,72	0,73	0,66	0,68	0,67	0,66	0,67
Palancia-Los Valles	0,66	0,61	0,55	0,64	0,67	0,59	0,68	0,61	0,58	0,57
Turia	0,44	0,39	0,38	0,4	0,44	0,45	0,43	0,39	0,37	0,33
Júcar	0,29	0,26	0,23	0,23	0,22	0,19	0,16	0,14	0,14	0,14
Serpis	0,41	0,43	0,45	0,5	0,69	0,63	0,78	0,70	0,67	0,72
Marina Alta	0,51	0,51	0,55	0,69	1,00	0,92	0,96	0,89	0,90	0,82
Marina Baja	0,80	0,80	0,80	0,85	1,00	1,00	1,00	0,92	0,92	0,88
VinalopóAlacantí	0,74	0,73	0,83	0,95	1,00	0,86	0,87	0,80	0,82	0,73

System	Risk evaluation	Status
Cenia-Maestrazgo	LOW	NORMAL
Mijares-Plana de Castellón	LOW	NORMAL
Palancia-Los Valles	LOW	NORMAL
Turia	MIDDLE	PREALERT
Júcar	VERY HIGH	EMERGENCY
Serpis	LOW	NORMAL
Marina Alta	VERY LOW	NORMAL
Marina Baja	VERY LOW	NORMAL
Vinalopó-Alacantí	LOW	NORMAL

Drought indicator for the state of exploitation systems



	Values of the status indicator			
	Entry in the scenario		Exit of the scenario	
	Duration	Condition	Condition	Exit scenario
Normal	-	$\geq 0,50$	-	
Prealert	3 consecutive months	$]0,5 - 0,30]$	3 consecutive months with $I_e \geq 0,50$	Normal
Alert	2 consecutive months	$]0,3 - 0,15]$	2 consecutive months with $I_e \geq 0,50$ 6 consecutive months with $I_e]0,5 - 0,30]$	Prealert
Emergency	2 consecutive months	$< 0,15$	2 consecutive months with $I_e]0,5 - 0,30]$ 6 consecutive months with $I_e]0,3 - 0,15]$	Alert



Action Plan 2005/08....

Actions implemented to minimise environmental drought impact

Actions implemented to management and policy

Actions implemented to conservation, save water

Actions implemented to obtain other resources

Environmental measures

River flows maintenance

Wetlands control

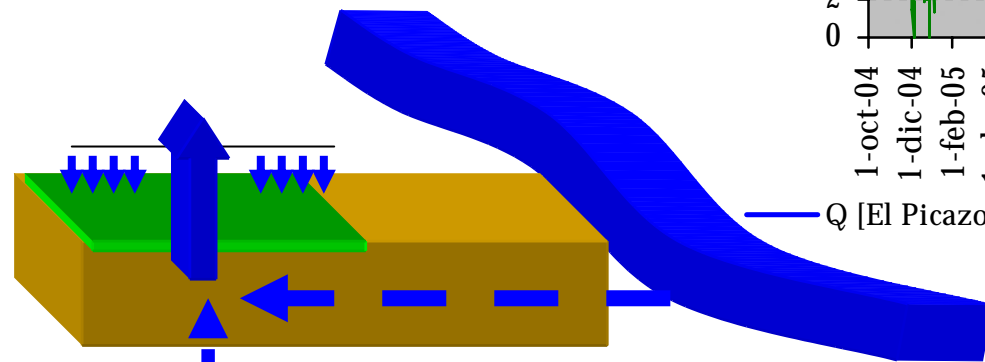
Environmental measures (1)

River flows maintenance



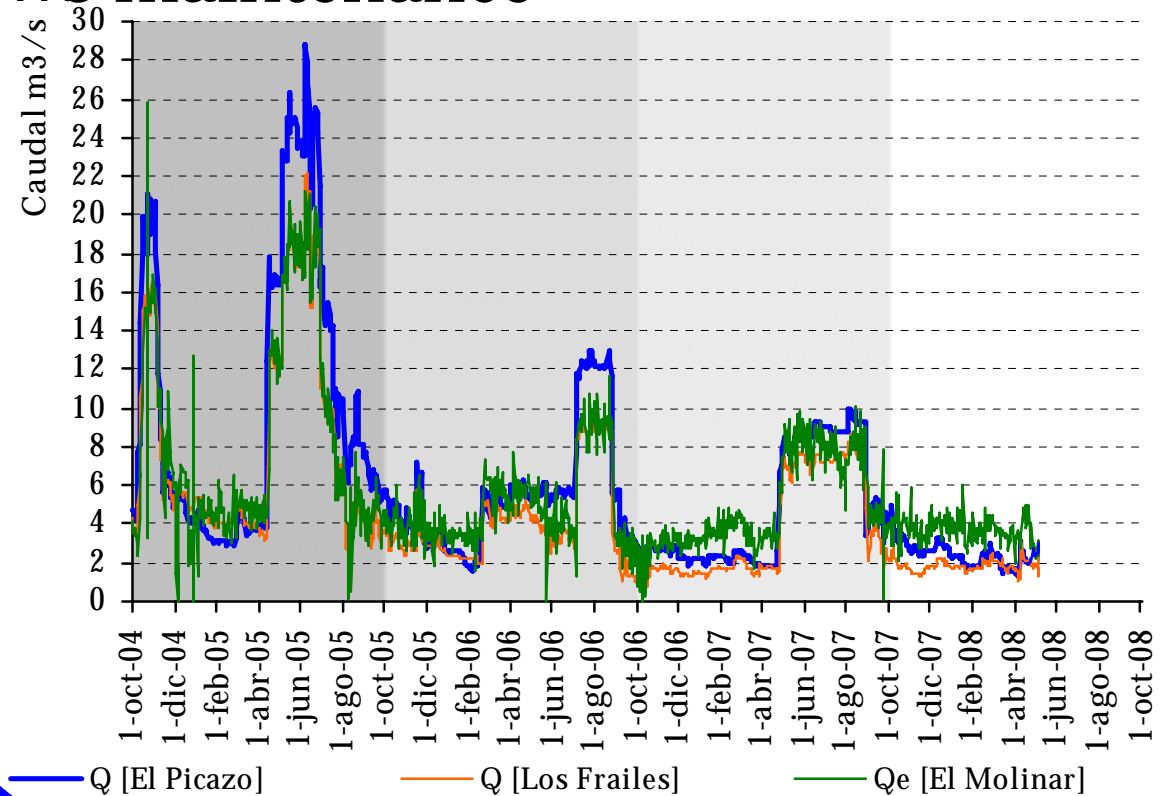
Irrigation

Júcar river



From aquifer

From Júcar river



Follow-up on the middle reach of river Júcar

Objective: Maintenance of a minimum flow in river Júcar, in the reach downstream the Alarcón reservoir



Júcar river during summer 1995



Júcar river during summer 2006 and
2007

Reduction of uses 2007-08

AGREEMENT FOR THE REALISATION OF A PUBLIC OFFER FOR THE AQUISITION (POA) OF WATER RIGHTS IN THE MIDDLE REACH OF THE JÚCAR RIVER BASIN DUE TO ENVIRONMENTAL REASONS

Objective: Reduction of water extractions in the middle reach of the Júcar River, both in the superficial water supplies and those groundwater supplies with a major effect on the river flow.

2007 Acquisition of the water rights due to the reduction of irrigated surfaces

2008 Acquisition of water rights due to the cultivation of crops which need less water

Environmental measures (2)

Albufera wetland
Ramsar site

Measurement network:

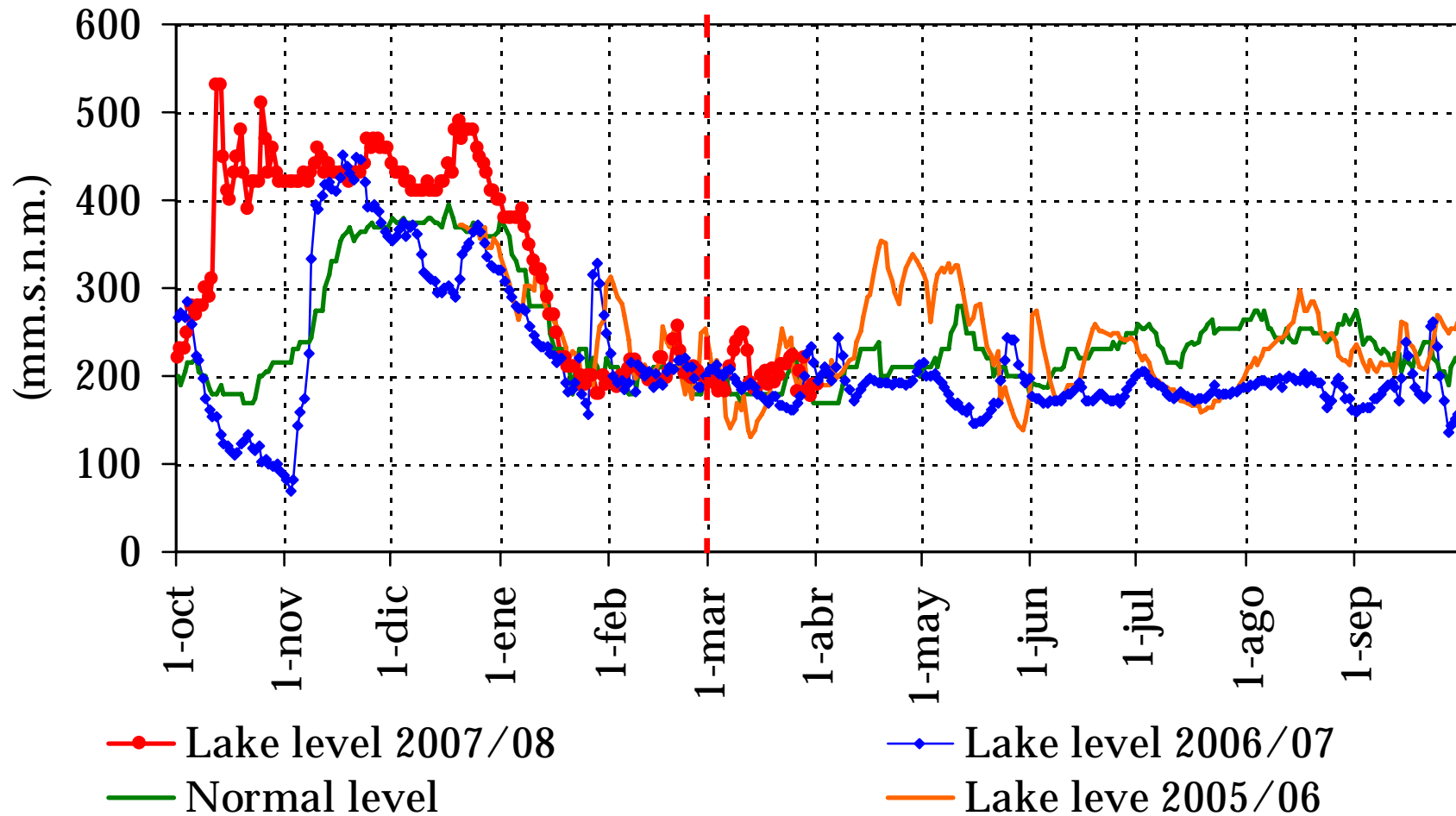
- Lake level
- Flows at 5 discharge points



Follow-up measures in the Albufera lake in Valencia



Level follow-up in the Albufera lake



Management and policy measures

Water Quality Simulation Model
Júcar

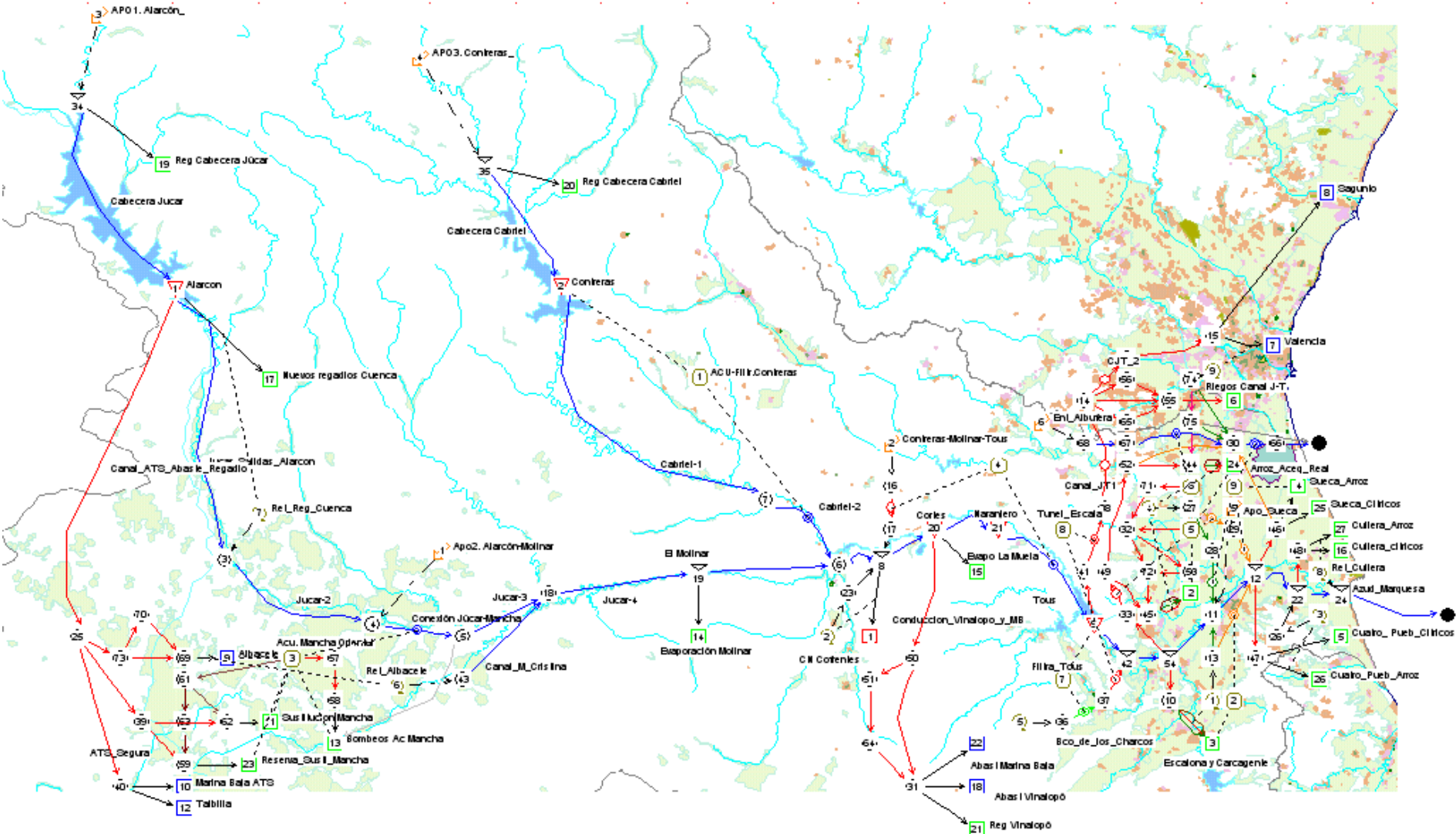
Mobil quality water station



Dissolve oxygen
Conductivity
Etc...



Júcar management Simulation model

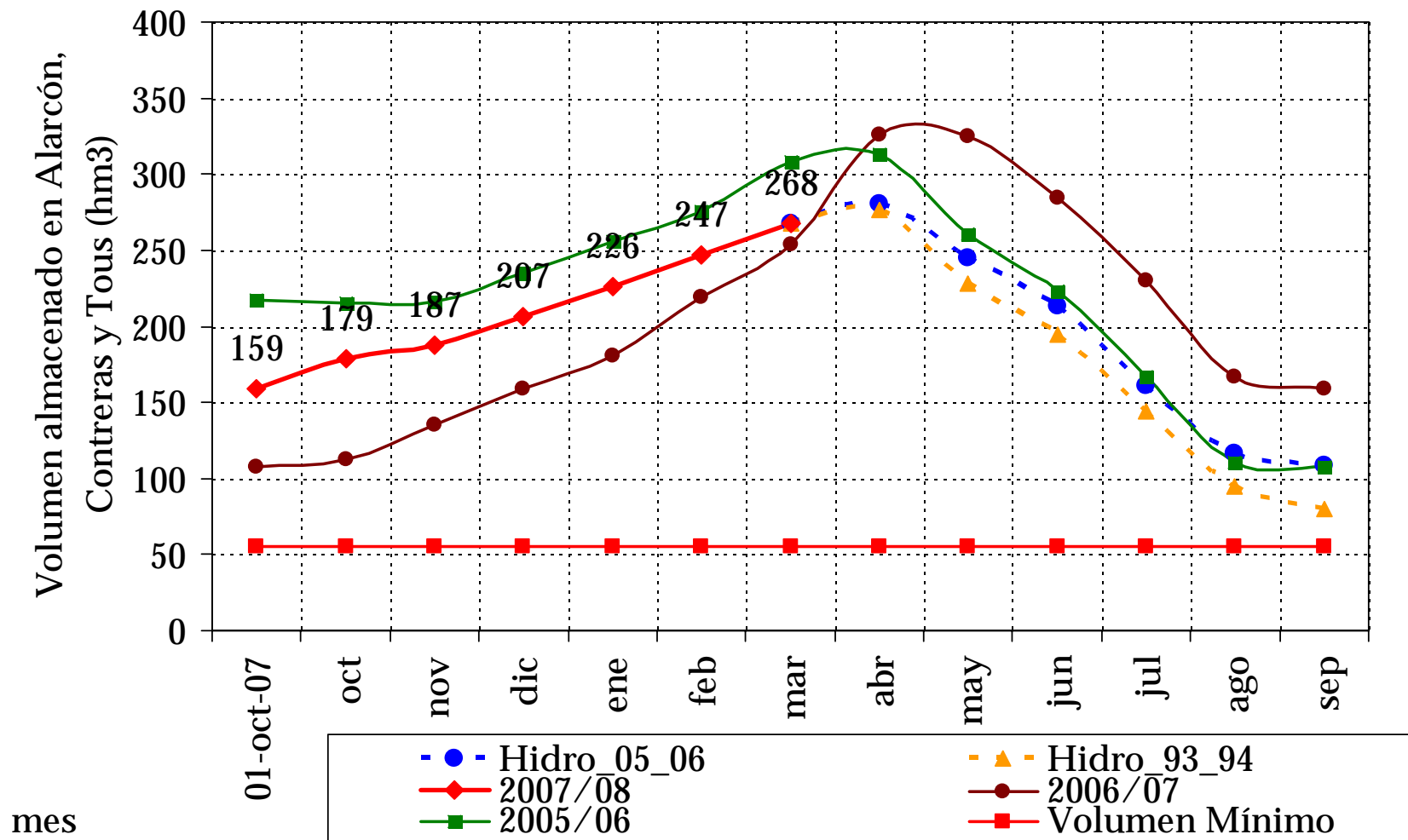


Forecast Campaign 2007/2008 (calculation 1 april 2008)

Supply 2006/07

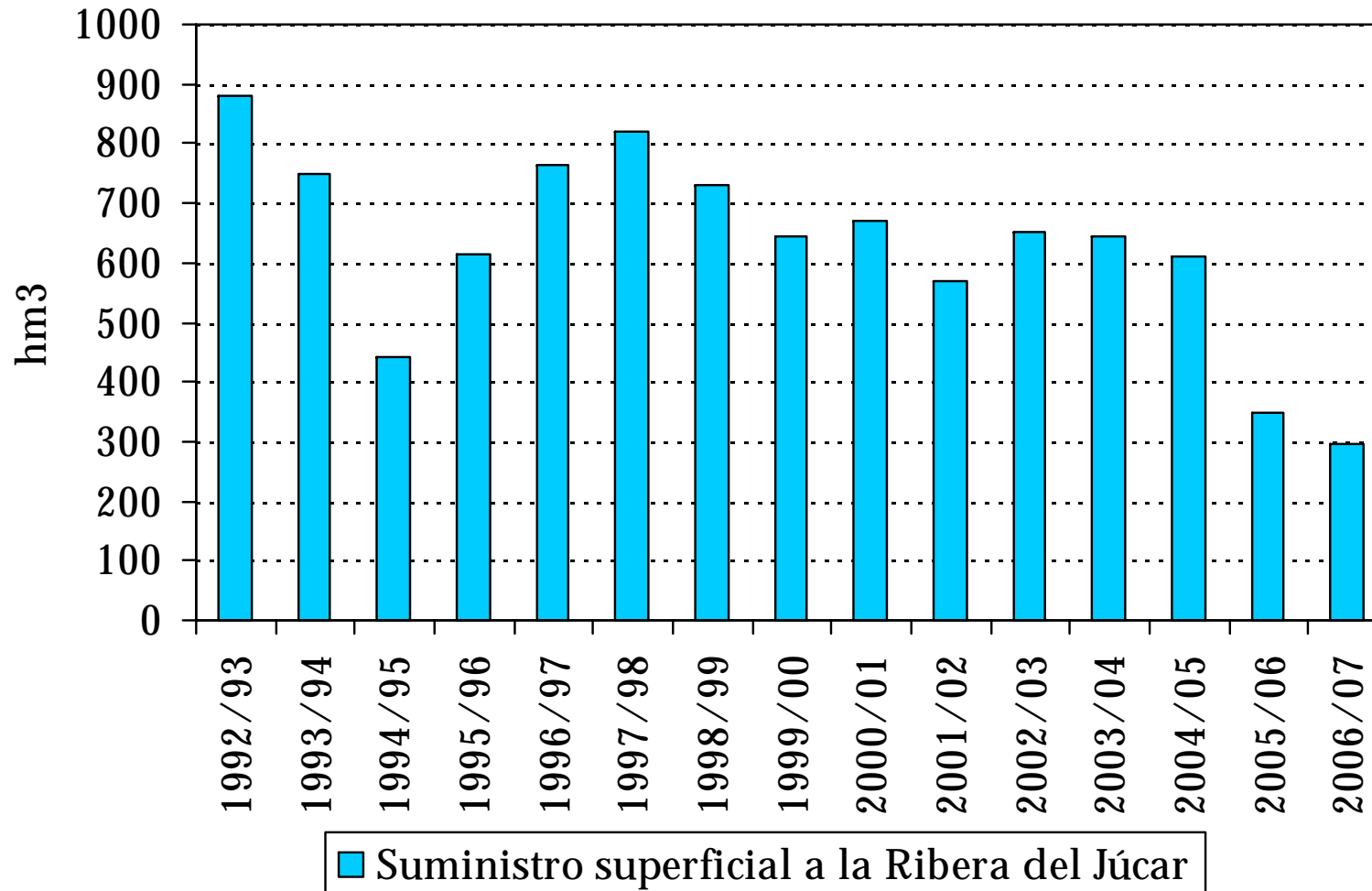
Inflows 2005/06 (blue)

Worst Inflows 1993/94 (orange)



Conservation, saving water measures

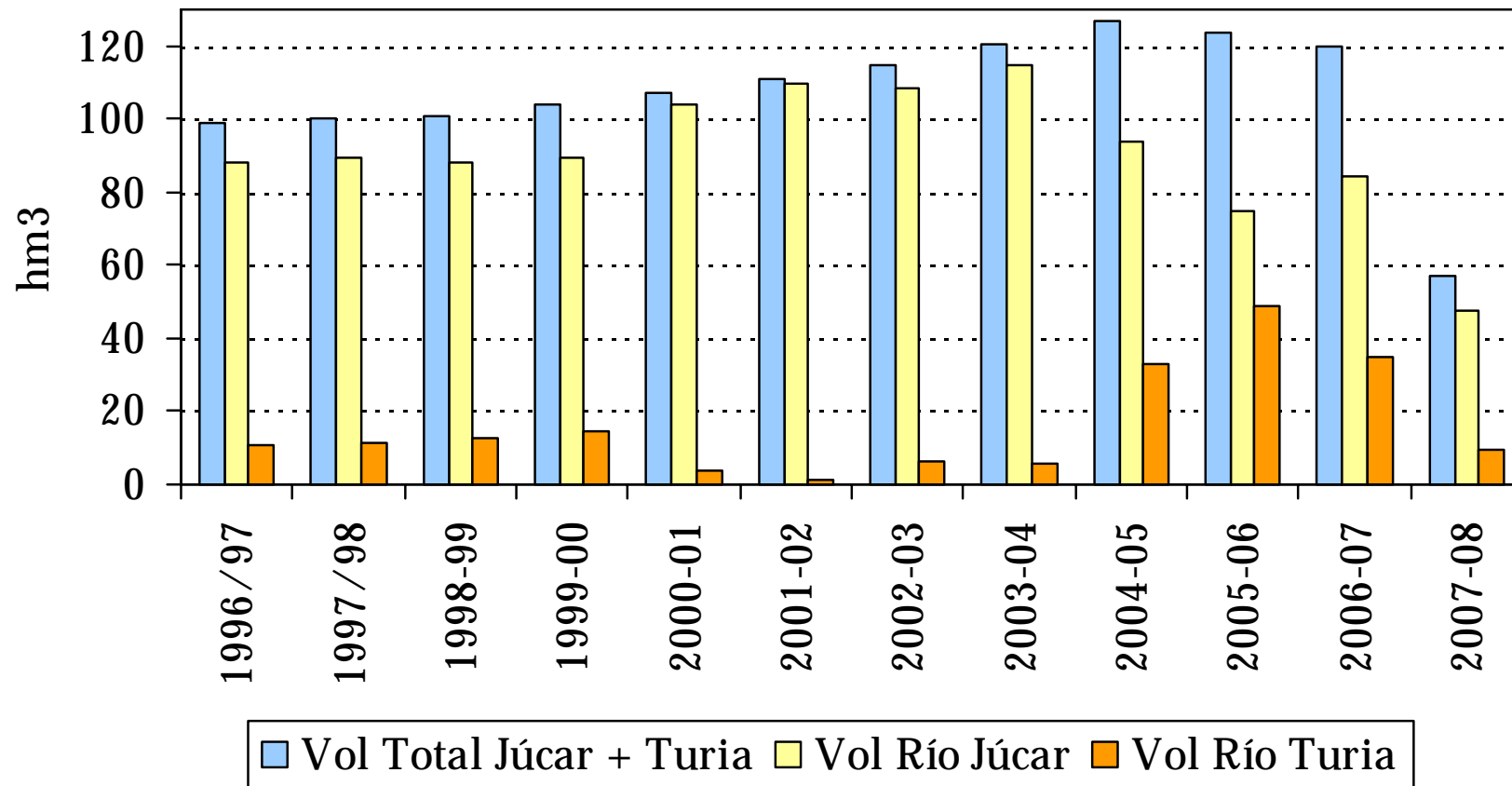
Historical analyses of water supply Superficial water volume diverted to irrigation from the Júcar river



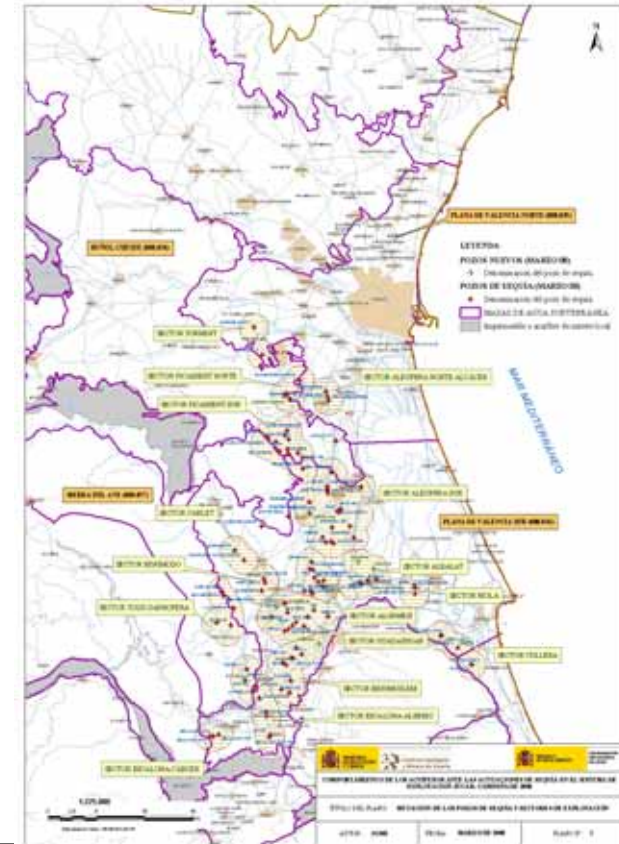
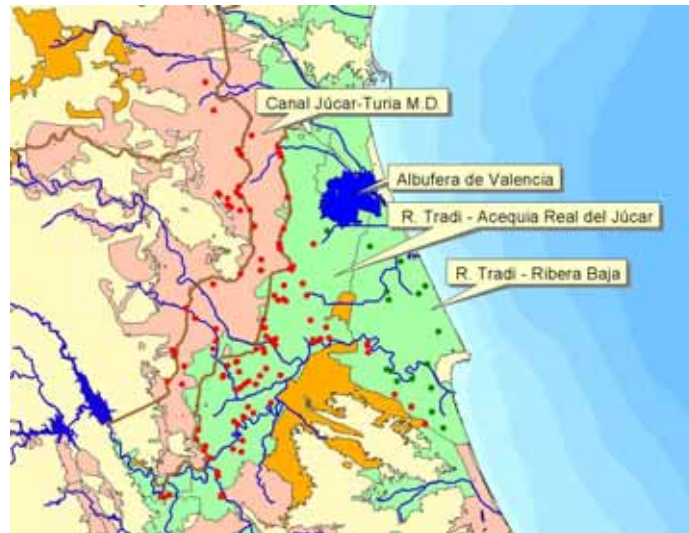
To obtain other water resources

- Supply from other rivers
- Use of drought wells (conjunctive use)
- Waste water Reuse

Historical analyses of water supply Supply for metropolitan area of Valencia with superficial water from Júcar and Turia



Drought wells and pumping stations in irrigation networks



2008	Pozos	Rebombeos	Total instalaciones
Acequia Real del Júcar	64	1	65
Real Acequia de Escalona	7		7
Real Acequia de Carcaixent	3		3
Sindicato de Riegos de Sueca		13	7
Sindicato de Riegos de Cullera	6	8	14
Acequia Mayor de la Villa y Honor de Corbera	3	1	4
Comunidad General del Canal Júcar-Turia	37		37
Total	120	23	146

Monthly control Albufera lake

Drought well data:
Volume and level



Pumping station in
irrigation network



Waste water reuse (with remove nutrients)

Joint between Pinedo
treatment plant and
Oro irrigation
network



EDAR	Pinedo II. Ampliación		Carraixet	Paterna-Fte. del Jarro	
Año	Acequia Favara (m ³)	Acequia del Oro (m ³)	Acequia de Rascanya (m ³)	Acequia de Tormos (m ³)	Acequia de Moncada (m ³)
2006/07	6.780.615	50.153.225	3.791.400	603.004	828.506
2007/08 *	1.478.523	29.609.135	1.450.000	144.347	338.488

Emergency Works 2005-08

Emergency works

Main investment in:

- Improvement of the water supply guarantee for municipalities and alternative sources of resources.
- Improvement of the treatment system of potable water
- Improvement of the effectiveness of the irrigation systems

Emergency work	Budget (thousand €)
Emergency works 2005	19.285,0
Emergency works 2006	35.286,0
Emergency works 2007	15.350,0
Emergency works 2008 (still ongoing)	4.940,0
Total	74.861,0

Experiences in the River Basin Droughts Plans

.. EWFD

Thank you for
your
attention!

