

DROUGHT MANAGEMENT: DESIGNING RULES FOR CONJUNCTIVE USE UNDER DROUGHT. THE ROLE OF GROUNDWATER SOURCES



GOBIERNO
DE ESPAÑA

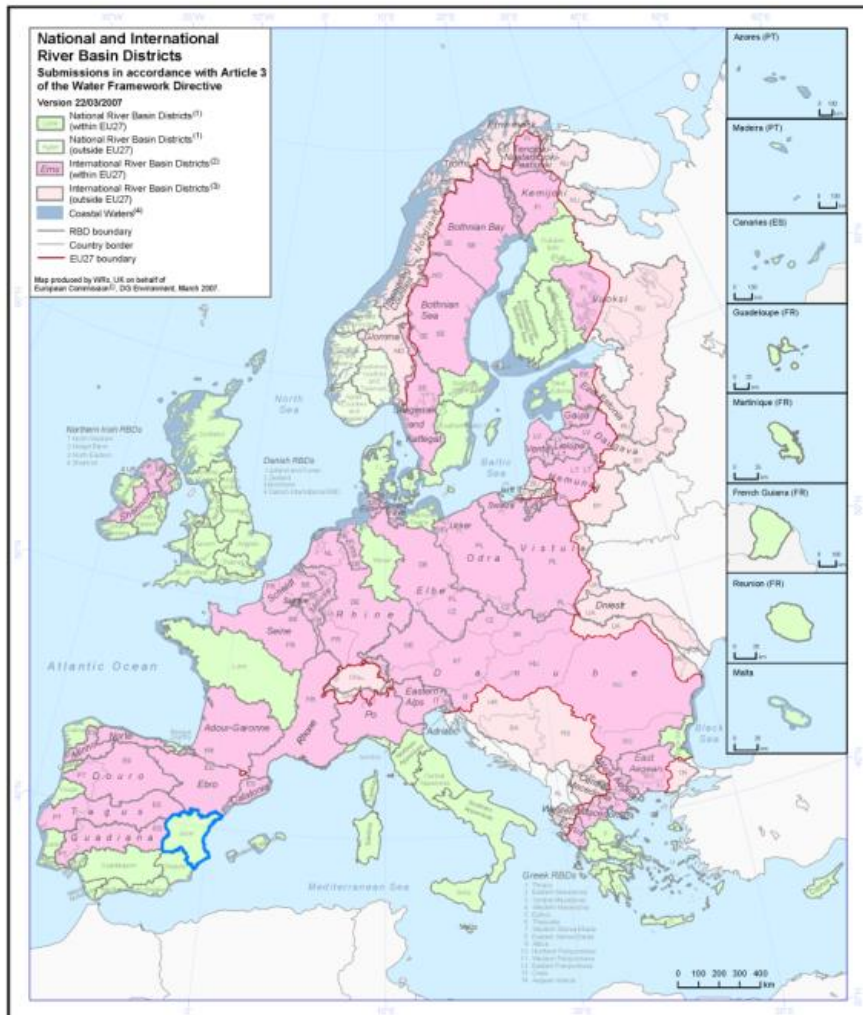
MINISTERIO
DE AGRICULTURA Y PESCA,
ALIMENTACIÓN Y MEDIO AMBIENTE

CONFEDERACIÓN
HIDROGRÁFICA
DEL JÚCAR, O.A.

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Hydrological Planning Office
Júcar River Basin Authority

The Jucar River Basin District context

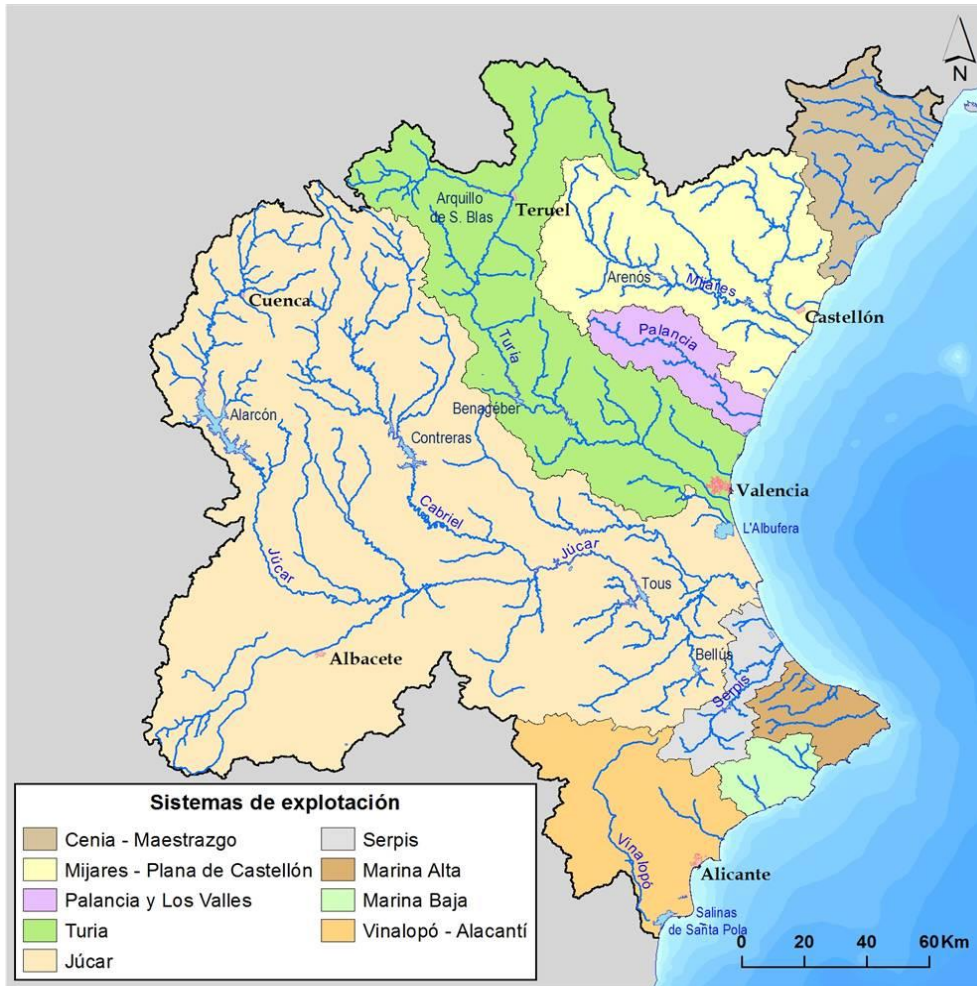
Where we are...



Footnotes:

- Map based largely on submissions of digital River Basin Districts (RBDs) from EU Member States and Norway.
- Some of the international RBDs shown on this map were not identified as being international by the Member States, i.e. the Adour-Garonne, Rhone and Seine in France, the Vistula in Poland, the Kenjoki and Vuoksi in Finland. Both the German Elbe and Schlei/Trave RBDs are shared with the Danish international RBD. Part of the Italian Eider and Sotchi/Trave RBDs is shared with the Slovenian Adriatic RBD. It is understood that the Torino/Alpi international RBD in Finland is shared with Sweden, most likely with part of the Bothnian Bay international RBD. As the Bothnian Bay covers several river catchments, the Torne/Sotchi and Bothnian Bay have been kept separate in this map. The delineation of the Finmark RBD between Norway and Finland is currently under review.
- These are the boundaries of the river catchments extending beyond the EU27 border. They have been derived from the Catchment Characterisation and Modelling (CCM) database, developed by the Joint Research Centre (JRC), except the boundaries for the Danube international RBD which were supplied by the International Commission for the Protection of the Danube River (ICPDR).
- Coastal waters are defined in the Water Framework Directive (WFD) as extending 1 nautical mile from the coastline. However, some Member States have included a larger part of their coastal waters within the RBD boundaries.

Description of the JRBD

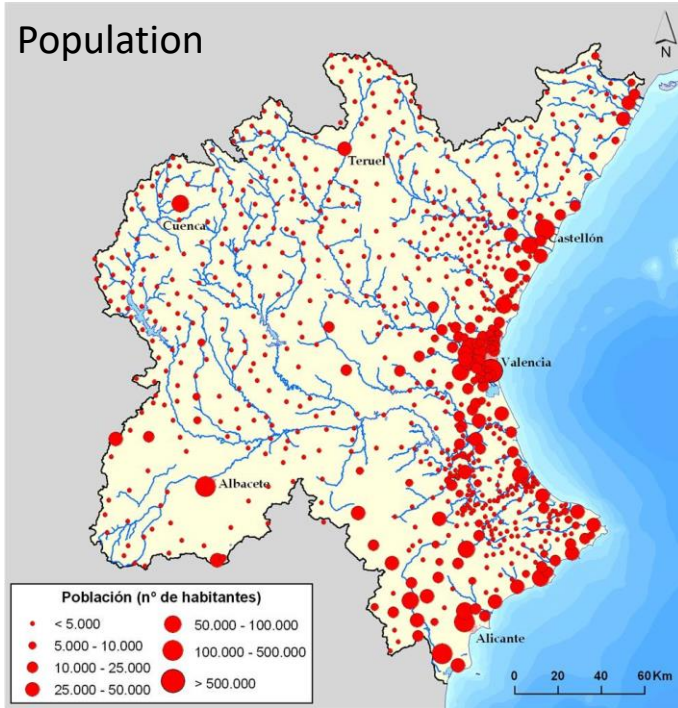


Surface (km ²)	42.735
Permanent population (2012)	5.178.000
Total equivalent population (2012)	5.697.000
Irrigated surface (ha)	390.000
Total inflow (hm ³ /year)	3.800
Total water demand 2012 (hm ³ /year)	3.240

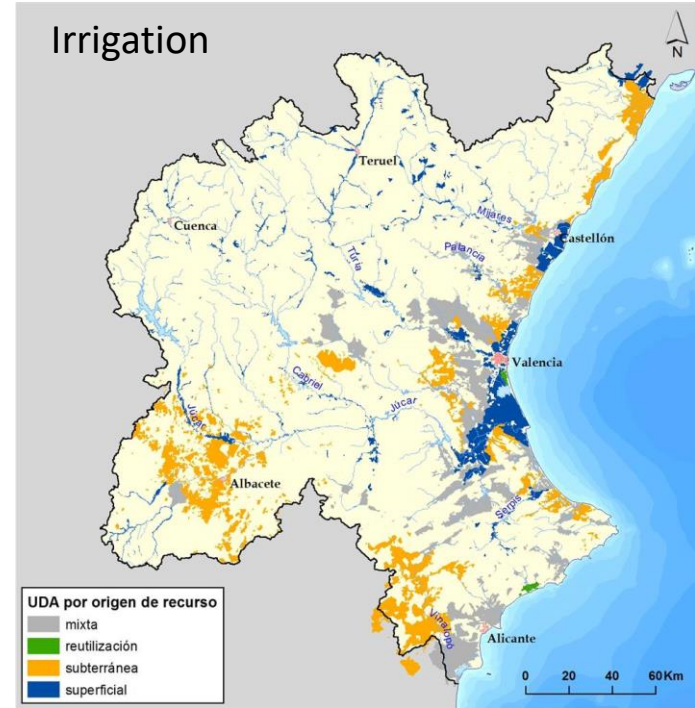
Water resources systems

Water demands in the JRBD

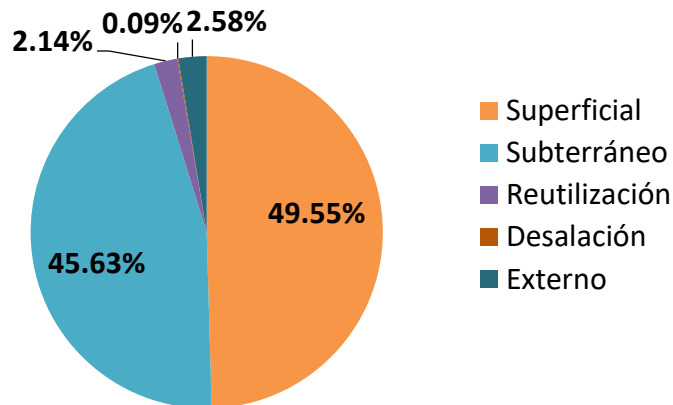
Population



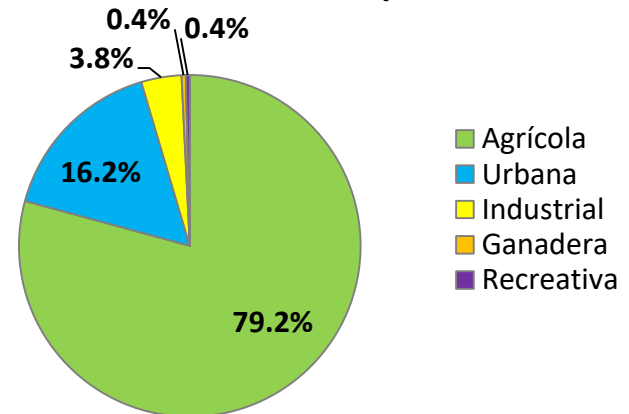
Irrigation



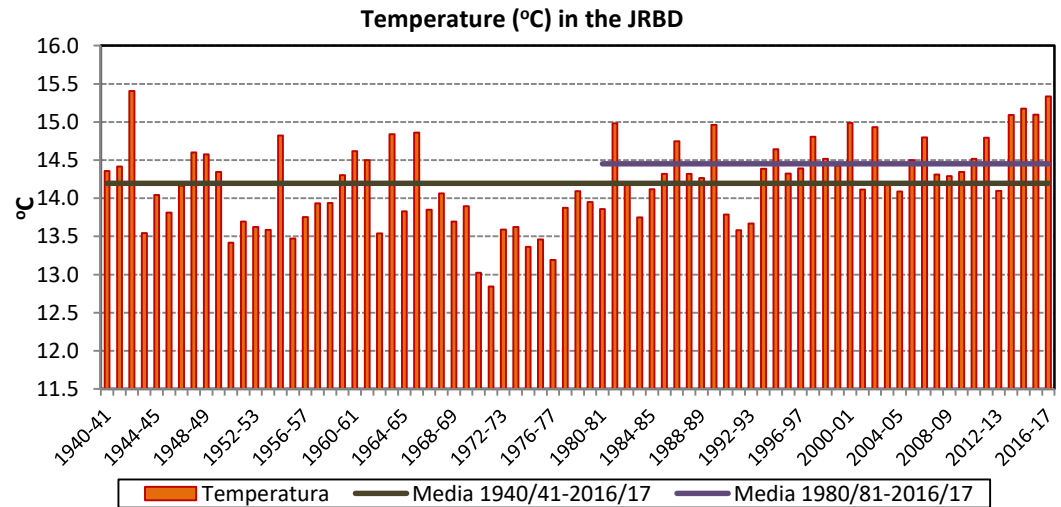
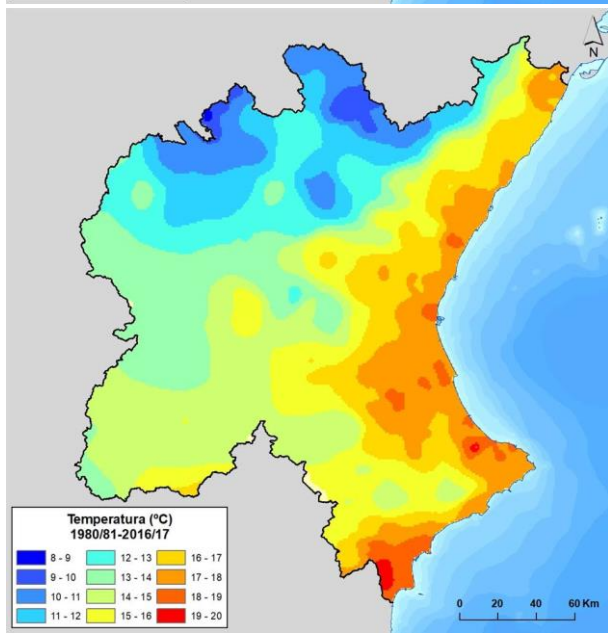
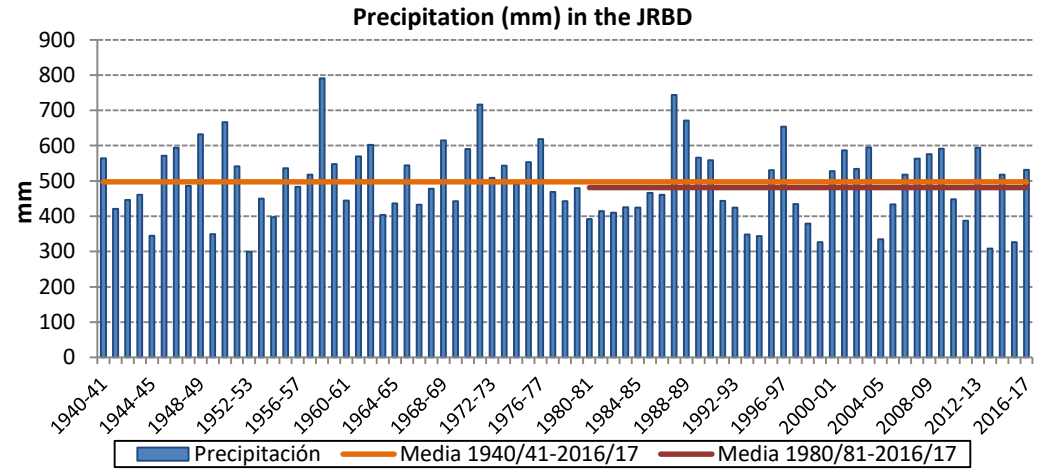
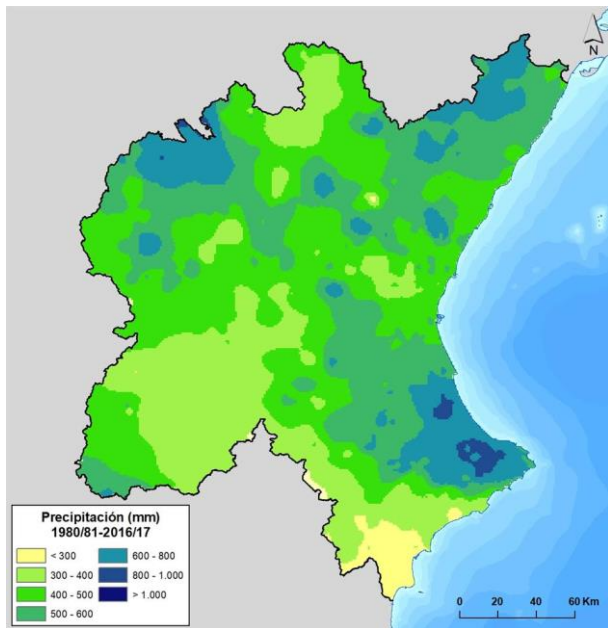
Total Demand per source



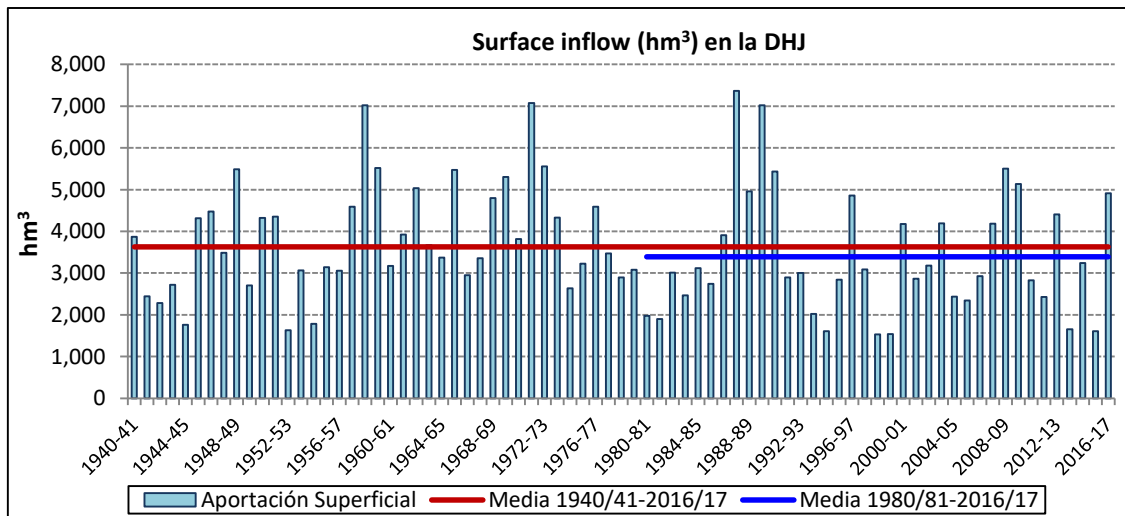
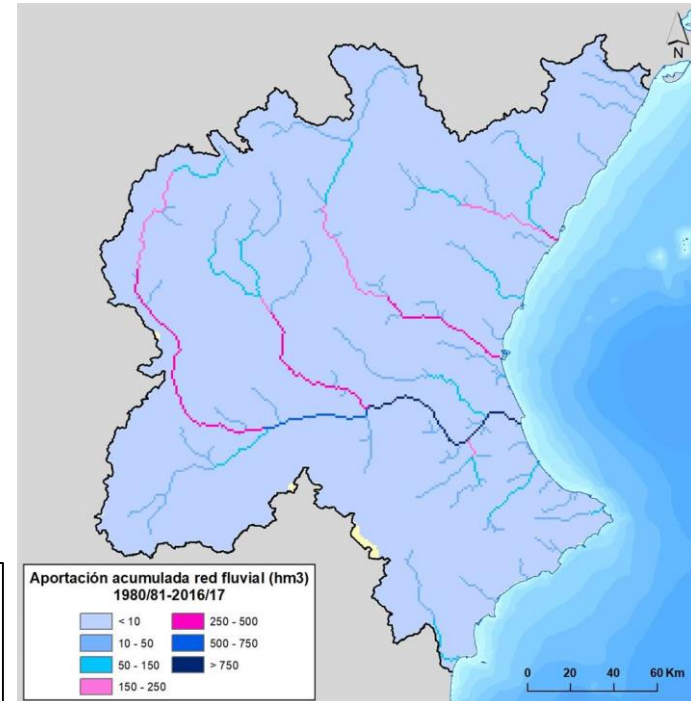
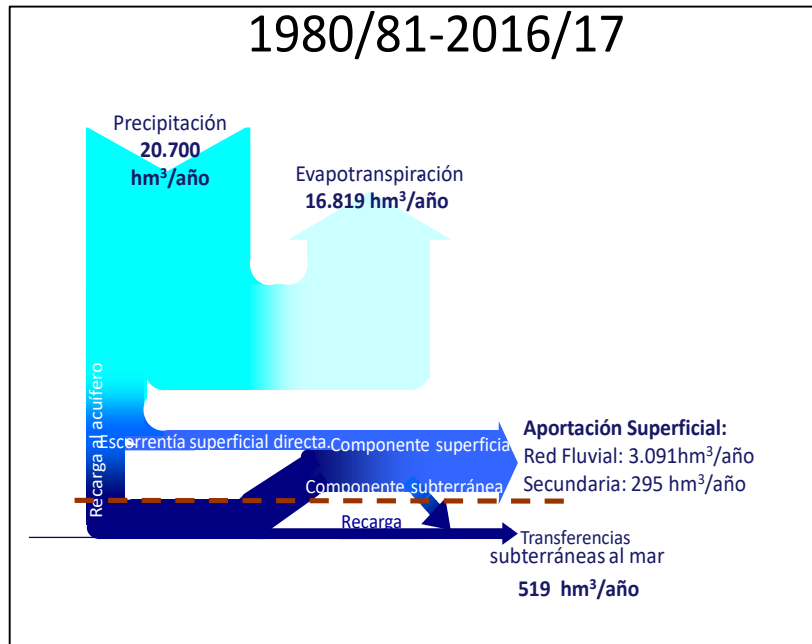
Total demand per use



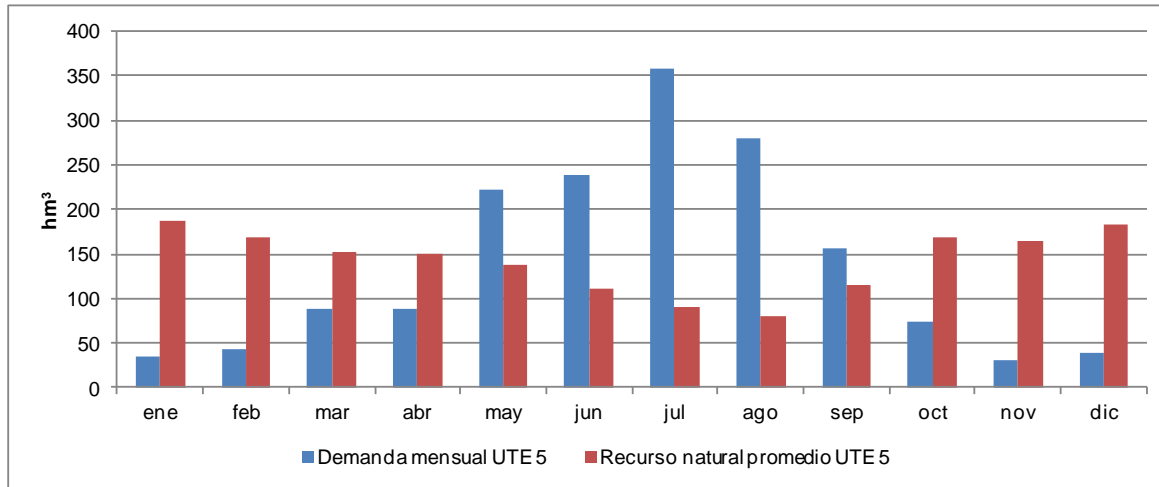
Water resources in the JRBD



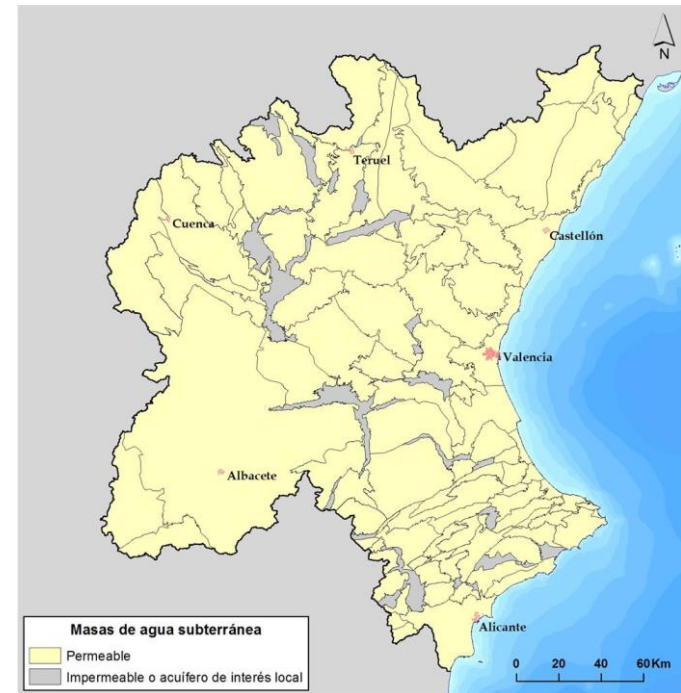
Water resources in the JRBD



Balance

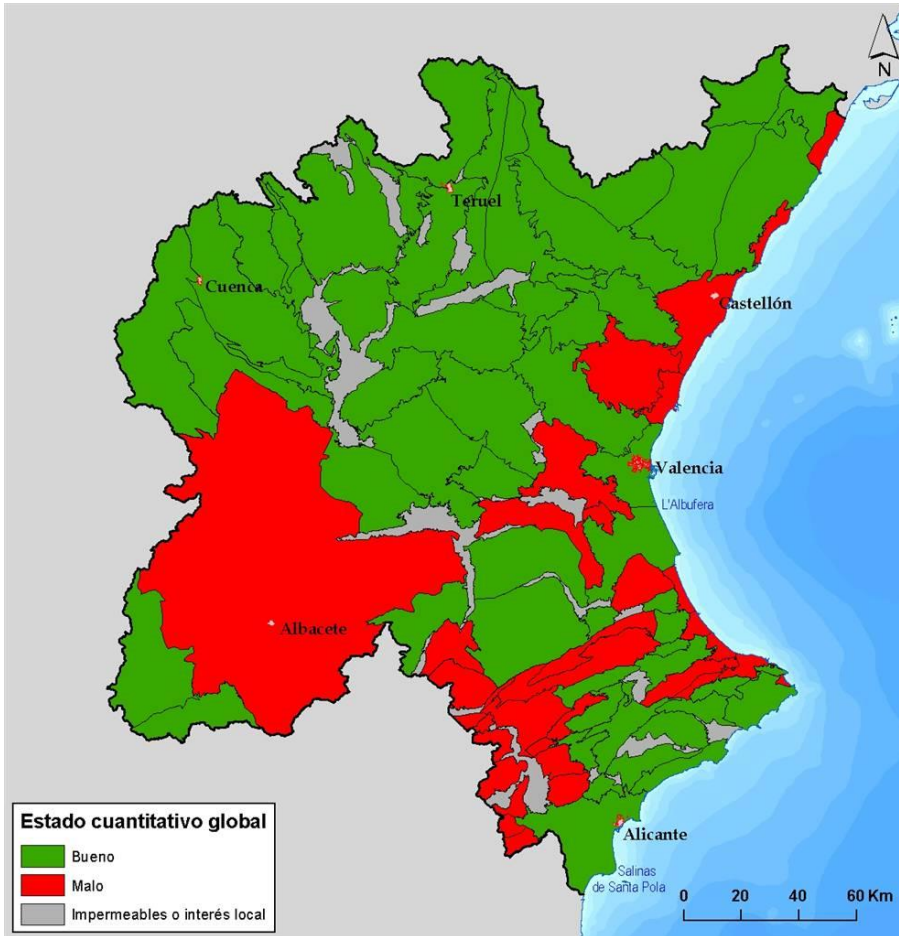


Reservoirs

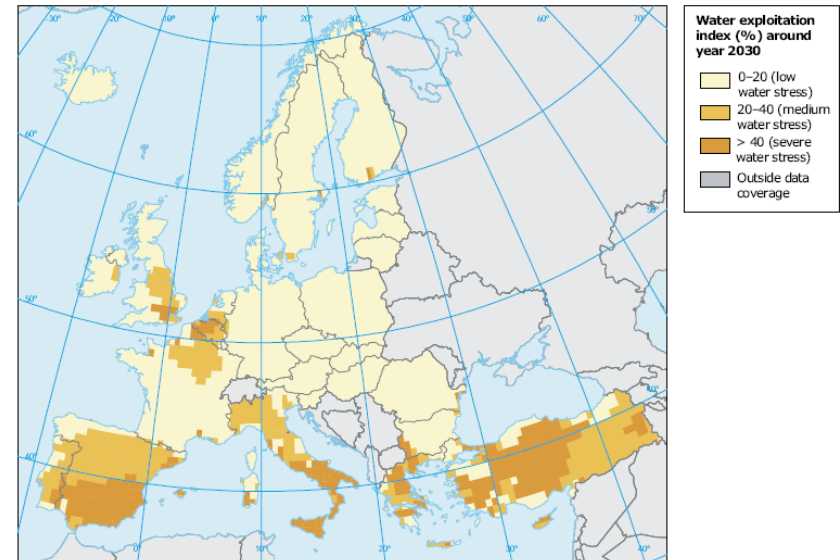


Groundwater bodies

It leads to...



Quantitative groundwater status



Water Exploitation index in the EU (expected for 2030).
Source: EEA

Legal Framework for drought management in Spain

Drought management as emergency situation

- Spain has suffered important drought periods with severe impacts on water resources and water uses.
- Traditionally, droughts have been considered as an emergency situation to be restored with extraordinary water resources and measures.

Policy bases for Drought Management Plans

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

- The **Ministry of Environment** will establish a **global hydrologic indicator system** to foresee drought situations and to serve as general reference for the formal declaration of droughts.
- **River Basin Organisations** will develop **Drought Management Plans (DMP)**.
- **Public Administration in charge of public water supply** for population greater than **20.000 inhabitants** will develop an **Emergency Plan for Drought Situations**.

Drought Management Plans

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

Entities in charge: River Basin Organisations

Contents: includes diagnosis of situation, hydrological indicator system, programme of measures and management and follow-up system.

Approval: Ministerial Order in 2007 (*now under revision*)

A picture is worth a thousand words



Júcar river in summer 1995



Júcar river in summer 2006

A picture is worth a thousand words

Miércoles, 14 de julio de 1999
Levante - EL MERCANTIL VALENTINO - 35

La Marina Alta

Aumentan la explotación de los pozos para garantizar el suministro de agua en Xàbia

«habrá que esperar tres o cuatro días para que se regularice el servicio»

Jaume Benaloy es el primer cura que se ordena en Benidorm en 30 años

Alicia Masegosa



En Xàbia la población debe acudir a los depósitos para llenar las garrafas de agua potable. E. W.

El problema de presión en el suministro de agua que desde algunos días sufren algunas zonas de Xàbia comenzó a paliarse en la tarde de ayer con la entrada en funcionamiento de una nueva bomba que incrementa la explotación de las obras para aumentar la capacidad de explotación de los pozos en toda la red de abastecimiento de Amjasa (empresa municipal de aguas), explotada en el núcleo urbano del barrio de las áreas residenciales de Absudia y Balcón al Mar. En las zonas más elevadas del municipio, los cortes, que la semana ya había anunciado la empresa, se prolongaron desde las 22.00 horas. Sobre las restricciones que se aplicaron al cambio de bomba en el pozo de Piritis, el concejal de Obras, Jaime Sapena, advirtió que urgía realizar esas obras de mejora, porque «si no se hacen más en el verano, las metemos a las 15.30 horas alrededor de la nueva estación de extracción de ese municipio. Al aumentar, según comentó el edil, en un 30 por ciento el caudal que Piritis aporta a la red, la presión se fue regularizando y a las 20.00 horas ya había normalizado en todo el municipio. Sapena también anticipó que se van a entrar en funcionamiento los pozos de Bover y Pinets; una medida que respondía al mismo objetivo de aumentar los caudales que se inyectan a la red para, de este modo, garantizar el suministro. Además de las actuaciones para mantener el abastecimiento el nuevo equipo de gobierno

Jaume Benaloy Marco nació en la época del destape, del inicio de la movida y de las noches sin fin, y todo ello elevado a la enésima potencia, porque además lo hizo en Benidorm, cuando la ciudad gozaba de su máximo esplendor turístico y era sede de acogida de todo aquel deseoso de dar rienda suelta a su recién estrenada libertad. Hijo de madre murciana y padre benidormés, Jaume creció en el seno de una familia que se denomina a sí misma «católica, pero a la carta». Nada impidió que sintiera su vocación religiosa con tan sólo 17 años y, después de obtener unas excelentes notas en la selectividad, decidiera cambiar sus estudios por los de Teología. Ahora, con tan sólo 24 años se ha convertido en el primer sacerdote natural de Benidorm que ha sido ordenado desde hace más de tres décadas. Hace tan sólo unos días, el joven cantó su primera misa en la ciudad que le vio nacer, y poco después lo hizo en la Párrquia de la Inmaculada de Alicante, donde actualmente oficia. Cuando Jaime se decidió a comunicar a su familia lo que había estado meditando con respecto a su futuro, ya lo hizo a sabiendas de que les iba a desconcertar. «Nos hizo sentar en la mesa y nos dijo que nos iba a dar una noticia que nos sorprendería», dice su padre, Pep Benaloy, quien regenta un bar en Benidorm. A la gente que le rodea le costó entender su decisión, pero hoy su padre confiesa que «aunque entonces me desilusionó, ahora me estoy llevando las alegrías más grandes de mi vida».

Water shortage in Javea during the drought period in the 90's.

Main contents of the Jucar Drought Management Plan

Basic elements of the Special Drought Plan

- Drought characterisation and diagnose
- Indicator system in situations of prolonged drought and occasional water scarcity
- Measures and actions to develop during the different phases of drought and water scarcity
- Drought follow-up and post-drought reports. Assessment of socioeconomic and environmental impacts
- Reference framework for supply emergency plans

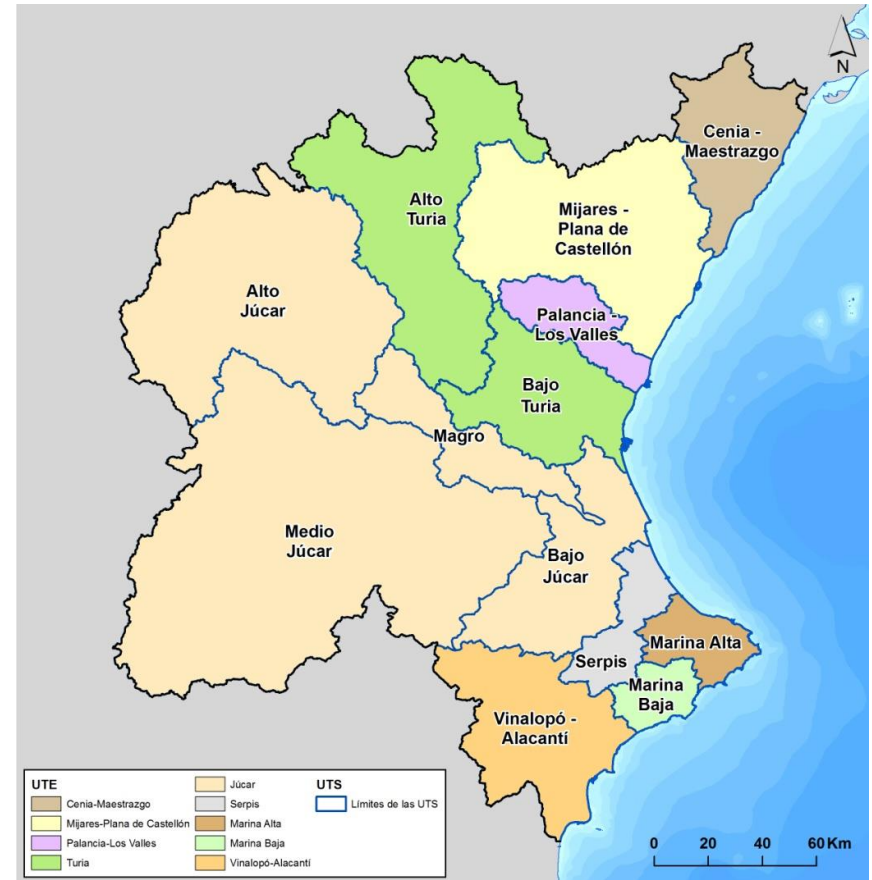
Indicators

Indicator system

Double system: indicators of prolonged drought and scarcity indicators

Indicators for prolonged drought: identify persistent and intense situations of decreased rainfall, reflecting contributions in natural regime (SPI12)

Indicators for scarcity: identify situations of difficulty to meet demands due to occasional shortage.



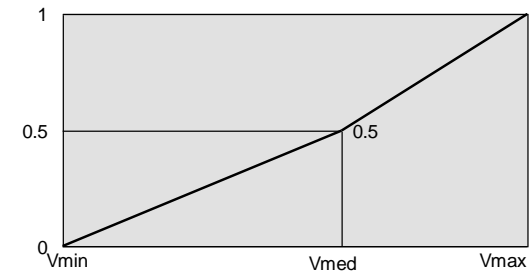
Water Scarcity Indicator System

Scarcity indicators: Based on rainfall data, piezometry, gauging and inflow to reservoirs and dammed volume



$$- Si V_i \geq V_{med} \Rightarrow I_e = \frac{1}{2} \left[1 + \frac{V_i - V_{med}}{V_{max} - V_{med}} \right]$$

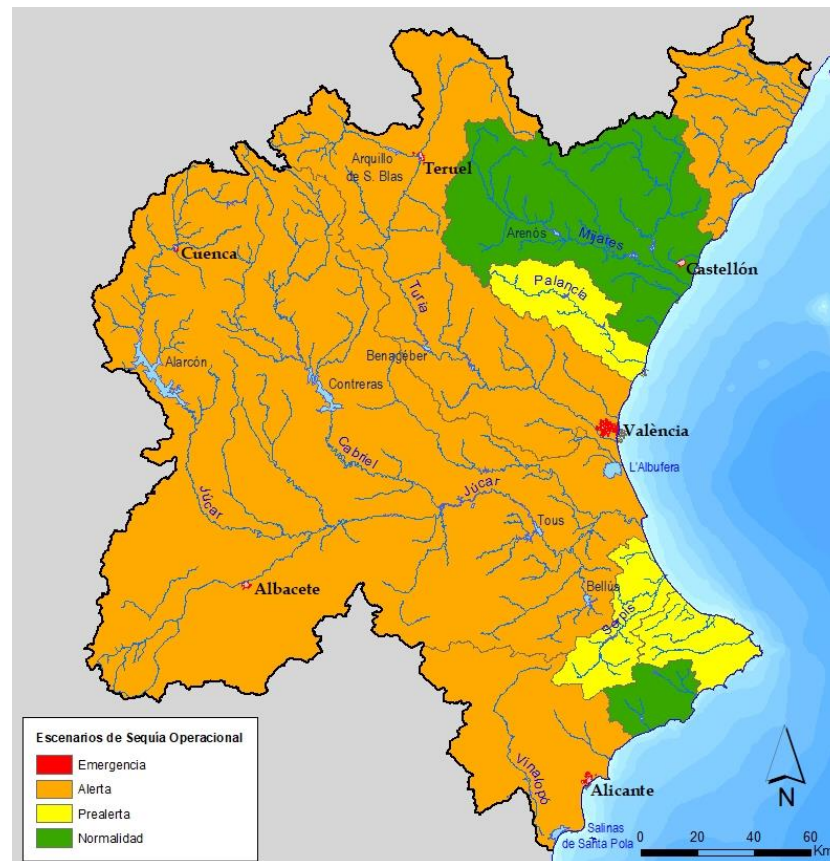
$$- Si V_i < V_{med} \Rightarrow I_e = \frac{V_i - V_{min}}{2(V_{med} - V_{min})}$$



Status Index	Status
0,75 – 1,00	NORMAL
0,50 – 0,75	
0,30 – 0,50	PRE-ALERT
0,15 – 0,30	ALERT
0,00 – 0,15	EMERGENCY

Aggregation per water resources system

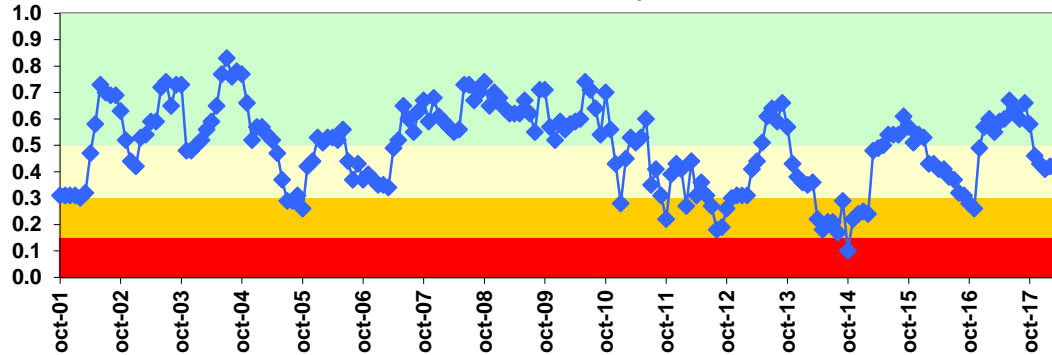
	WATER RESOURCES SYSTEM	Ind Estado 31/03/2018	Coefficiente Sist. Expl.	ÍNDICE SIST. EXPLOTACIÓN
1	Cenia-Maestrazgo	0,01	0,25	0,30
2		0,50	0,61	
3		0,00	0,14	
4	Mijares-Plana de Castellón	0,11	0,23	0,54
5		0,54	0,47	
6		0,88	0,30	
7	Palancia-Los Valles	0,17	0,28	0,42
8		0,49	0,44	
9		0,57	0,28	
10	Turia	0,30	0,12	0,28
11		0,06	0,07	
12		0,34	0,04	
13		0,25	0,16	
14		0,28	0,40	
15		0,38	0,10	
16	0,39	0,11		
17	Júcar	0,54	0,17	0,43
18		0,51	0,10	
19		0,52	0,01	
20		0,27	0,02	
21		0,57	0,10	
22		0,31	0,01	
23		0,28	0,12	
24		0,53	0,01	
25		0,22	0,01	
26		0,42	0,41	
27		0,53	0,02	
28	0,11	0,02		
29	Serpis	0,47	0,27	0,41
30		0,39	0,73	
31	Marina Alta	0,21	1,00	0,21
32	Marina Baja	0,47	1,00	0,47
33	Vinalopó-Alacantí	0,14	0,35	0,14
34		0,15	0,65	



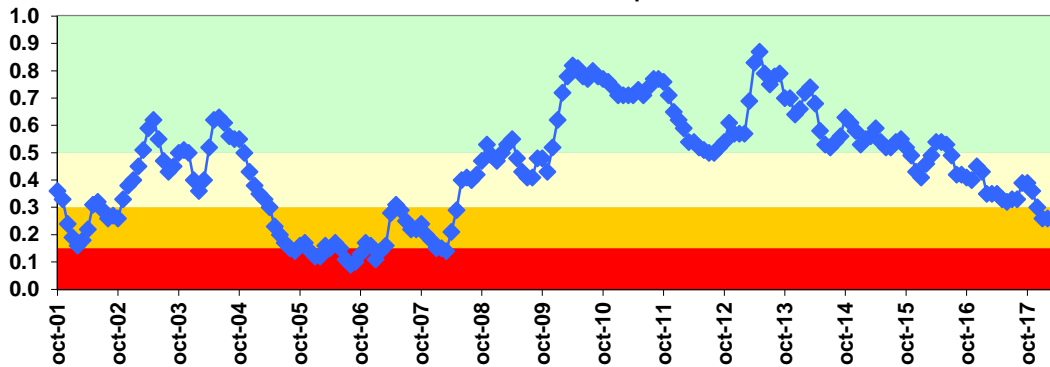
System	May	Jun	Jul	Ago	Sept	Oct	Nov	Dic	Ene	Feb	Mar
Cenia-Maestrazgo	0,51	0,49	0,48	0,48	0,50	0,42	0,35	0,30	0,29	0,29	0,30
Mijares-Plana de Castellón	0,77	0,76	0,73	0,71	0,74	0,74	0,62	0,60	0,42	0,54	0,54
Palancia-Los Valles	0,60	0,67	0,64	0,60	0,66	0,58	0,46	0,43	0,41	0,42	0,42
Turia	0,36	0,35	0,34	0,31	0,35	0,31	0,31	0,28	0,23	0,22	0,28
Júcar	0,40	0,38	0,39	0,40	0,39	0,40	0,36	0,30	0,26	0,26	0,43
Serpis	0,69	0,68	0,67	0,73	0,61	0,55	0,45	0,37	0,40	0,43	0,41
Marina Alta	0,67	0,69	0,69	0,74	0,75	0,74	0,72	0,43	0,27	0,30	0,21
Marina Baja	0,89	0,86	0,85	0,86	0,86	0,73	0,66	0,56	0,50	0,50	0,47
Vinalopó-Alacantí	0,62	0,63	0,64	0,67	0,68	0,64	0,57	0,34	0,23	0,29	0,14

Drought Management Plan in Júcar river basin: application of measures

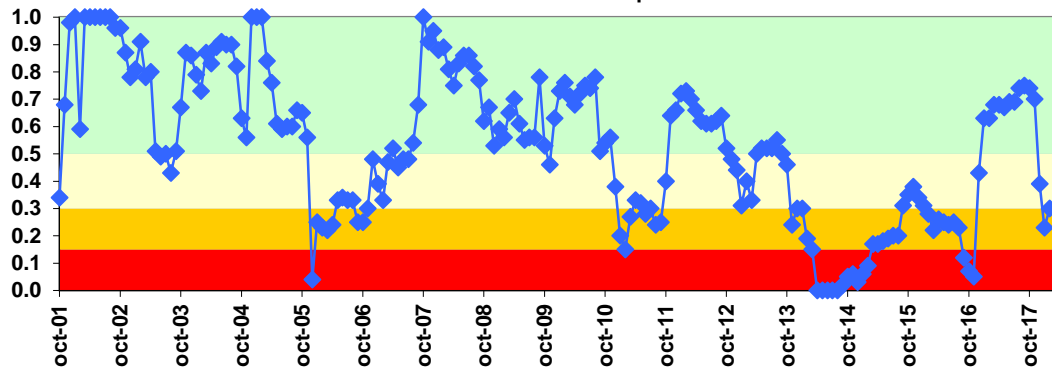
PALANCIA-LOS VALLES
Evolución Índice de sequía



JÚCAR
Evolución Índice de sequía



MARINA ALTA
Evolución Índice de sequía



Status Index	Status
0,75 – 1,00	NORMAL
0,50 – 0,75	
0,30 – 0,50	PRE-ALERT
0,15 – 0,30	ALERT
0,00 – 0,15	EMERGENCY

Drought indicator system is used to activate the measures to be applied.

Measures in the Drought Plan

Programme of Measures of the SPD

- The objective of the Special Drought Plan is to minimise the economic, environmental and social impacts of droughts.
- To this end, the SDP, in addition to making a spatial and temporal identification of droughts and water scarcity, programmes actions and measures that lead to mitigating their impacts.
- The SPD differentiates between:
 - Actions to implement in a prolonged drought scenario
 - Measures to apply in the occasional water scarcity scenarios (general and specific)

Type of measures in water scarcity

Scarcity scenarios				
Status situation	No scarcity	Moderate scarcity	Severe scarcity	Serious scarcity
Scarcity scenarios	Normal	Prealert	Alert	Emergency
Type of actions and measures activated	General hydrological planning and monitoring	Awareness, savings and monitoring	Management measures (demand and supply), and control and monitoring (Article 55 of the MTWA)	Intensification of measures considered on alert and possible adoption of exceptional measures (Article 58 of the MTWA)

Data sheets with specific measures for scarcity per UTE

The SDP includes data sheets with specific measures to deal with scarcity situations in each of the territorial units.

UTE 2 Mijares-Plana de Castellón		
Status	Examples of specific measures to adopt	Competent Authority
Prealert	Activate emergency plans for the supply systems of Almassora, Burriana, Castelló de la Plana, Vall d'Uixó, Onda, Vila-real and Consortium of Aguas de la Plana as well as those systems that in the future reach 20,000 equivalent inhabitants	Relevant Municipalities
	Analysis of the possibilities of using new resources contributed by reuse from the WWTP of Almenara, Almassora, Borriana, Xilxes, Llosa, Moncofa, Vall d'Uixó and Castelló de la Plana.	CHJ y GV
	...	CHJ y GV
Alert	Materialisation of the possibilities of taking advantage of new resources contributed by desalination from the IDAM of Oropesa and Moncofa	CHJ
	Restriction of up to 100% of the surface supply to the mixed irrigations of the Mijares, with respect to its surface consolidated demand, taking into account the application of the Bases Agreement for the Regulation of the Mijares River.	CHJ
	Reinforcement of surveillance actions for the conservation and protection of the resource and aquatic ecosystems considering the protection of wetlands, the protection of fluvial species and the impact of other measures on the natural environment, with special attention to the Marjal d'Almenara.	CHJ y GV
Emergency	...	
	Intensification of the possibilities of using new resources contributed by desalination from the IDAM of Oropesa and Moncofa.	CHJ
	Start of the restrictions to protect the available surface resources: between 15 and 25% of the supply to the traditional irrigations of the Mijares with respect to its consolidated demand.	CHJ
	Restriction of up to 100% of the surface supply to the mixed irrigations of the Mijares, with respect to its surface consolidated demand, taking into account the application of the Bases Agreement for the Regulation of the Mijares River.	CHJ
	Start of saving measures to protect the underground resources available in bodies of groundwater in poor quantitative state, especially in Plana de Castelló: reduction of up to 15%.	CHJ y users
...		

Examples of specific measures: restrictions

Proposed reduction percentage to users from UTE 4 Turia

Demand Unit	Source	Porcentajes de reducción			
		Normal	Prealert	Alert	Emergency
Supplies	Surface	0%	0%	0%	0%
Real Acequia de Moncada	Surface	0%	10-20%	25-35%	35-45%
	Total		10-20%	15-25%	20-30%
Vega de Valencia	Surface	0%	10-20%	35-45%	45-55%
	Total		10-20%	15-25%	20-30%
Pueblos Castillo	Surface	0%	10-20%	15-25%	25-35%
	Total		10-20%	15-25%	20-30%
Irrigation of the main Canal in Camp de Túria	Surface	0%	10-20%	30-40%	45-55%
	Total		5-15%	10-20%	15-25%

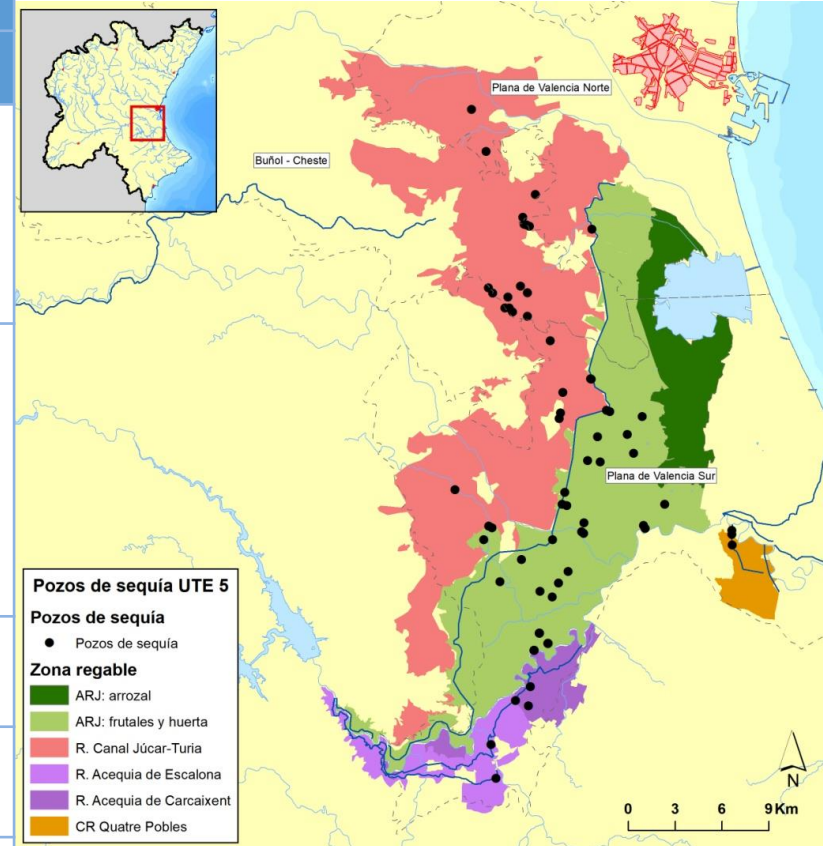
Examples of specific measures: restrictions on underground masses in poor quantitative state

- Initiation of saving measures to protect the resources available in groundwater bodies with poor quantitative status: general reduction up to 15% of abstractions for irrigation, depending on the territorial unit and the scenario.
- These restrictions will apply, especially in those groundwater bodies with significant abstractions for urban use or with special relation to surface water or protected natural spaces.
- This percentage of average reduction of 15% can be distributed spatially depending on the affection of groundwater abstractions to surface water or protected spaces.

Examples of specific measures: drought wells

Abstraction volumes through drought Wells according to scenario in UTE 5 Júcar

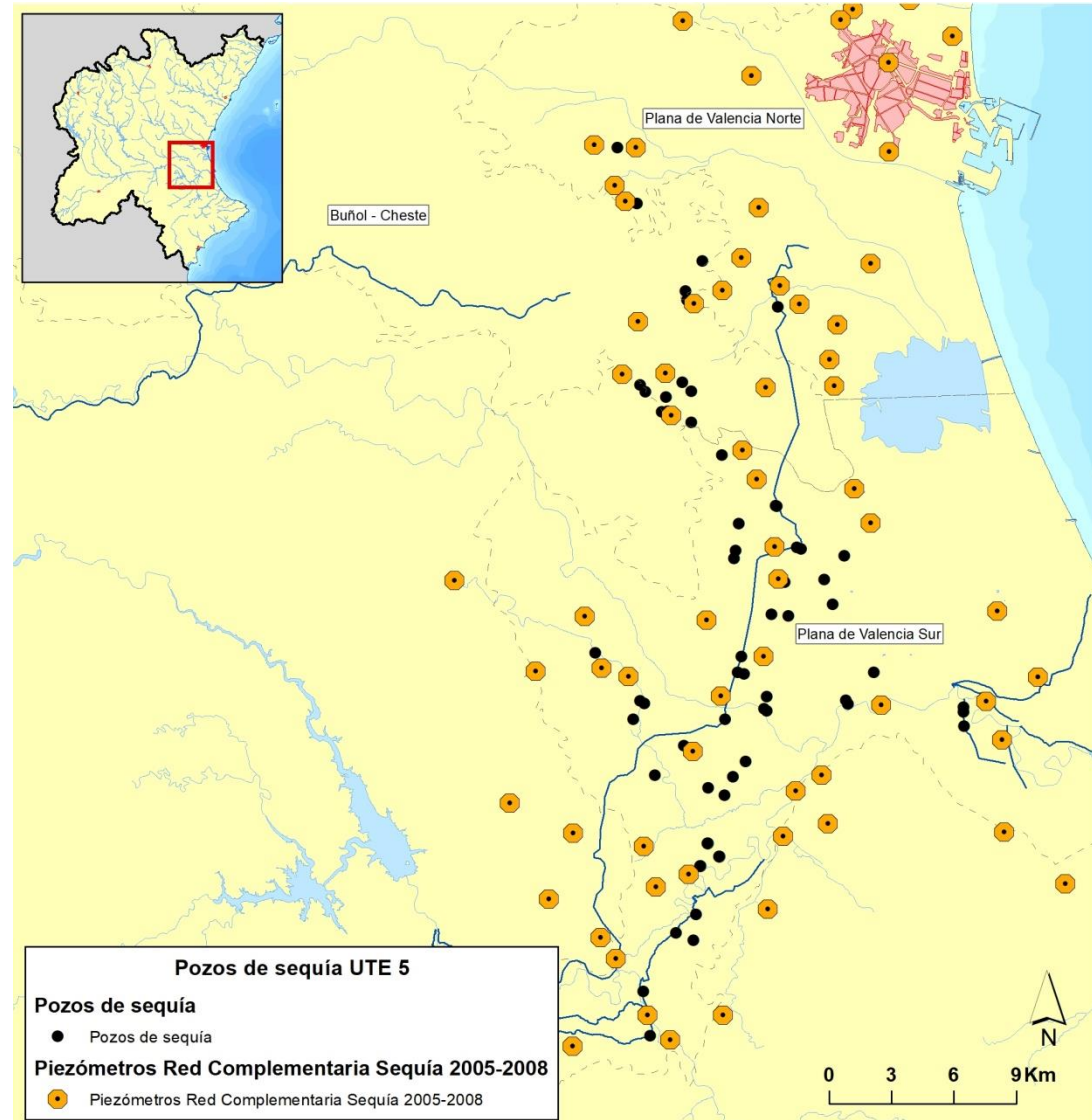
Irrigable area	Code	Name	Nº abstractions	Abstraction volumen according to scenario (hm ³ /year)			
				Total capacity	Prealert	Alert	Emergency
Acequia Real del Júcar	080.141	Plana de Valencia Norte	1	0,4	12,1	24,2	24,2
	080.142	Plana de Valencia Sur	37	23,8			
Canal Júcar-Turía	080.140	Buñol - Cheste	13	5,1	3,4	6,8	12,0
	080.141	Plana de Valencia Norte	5	2,3			
	080.142	Plana de Valencia Sur	9	4,6			
Real Acequia Escalona	080.142	Plana de Valencia Sur	2	2,0	1,0	2,0	2,0
Real Acequia Carcaixent	080.142	Plana de Valencia Sur	3	2,6	1,3	2,6	2,6
Acequia de Quatre Pobles	080.142	Plana de Valencia Sur	3	2,0	1,0	2,0	2,0
Total			73	42,8	18,8	37,6	42,8



Examples of specific measures: drought Wells monitoring

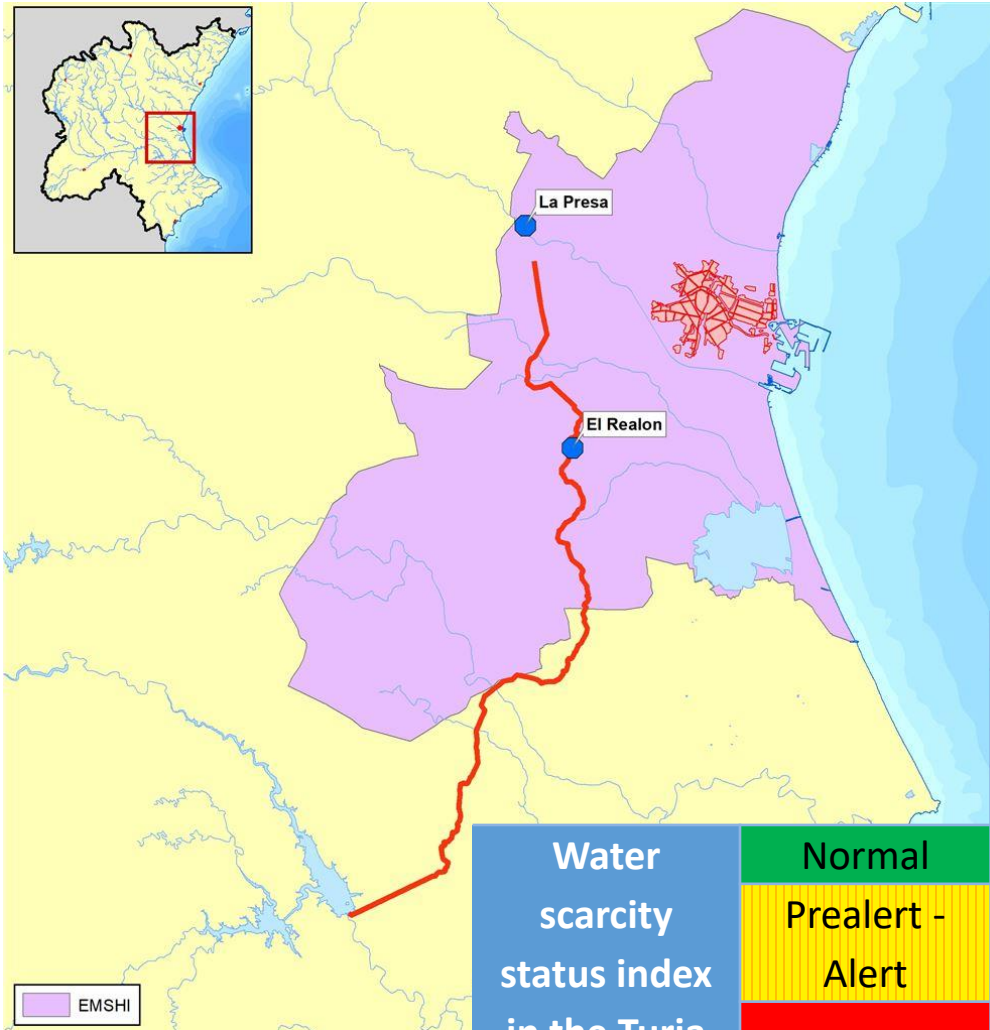
Control of abstractions in drought well extractions in UTE Júcar

- Improvement of the piezometric control in the areas of influence of the drought wells, especially in l'Albufera of València.



Examples of specific measures: changes in source

Percentage of distribution of the supply from the Turia and Júcar to the Metropolitan Area of Valencia.



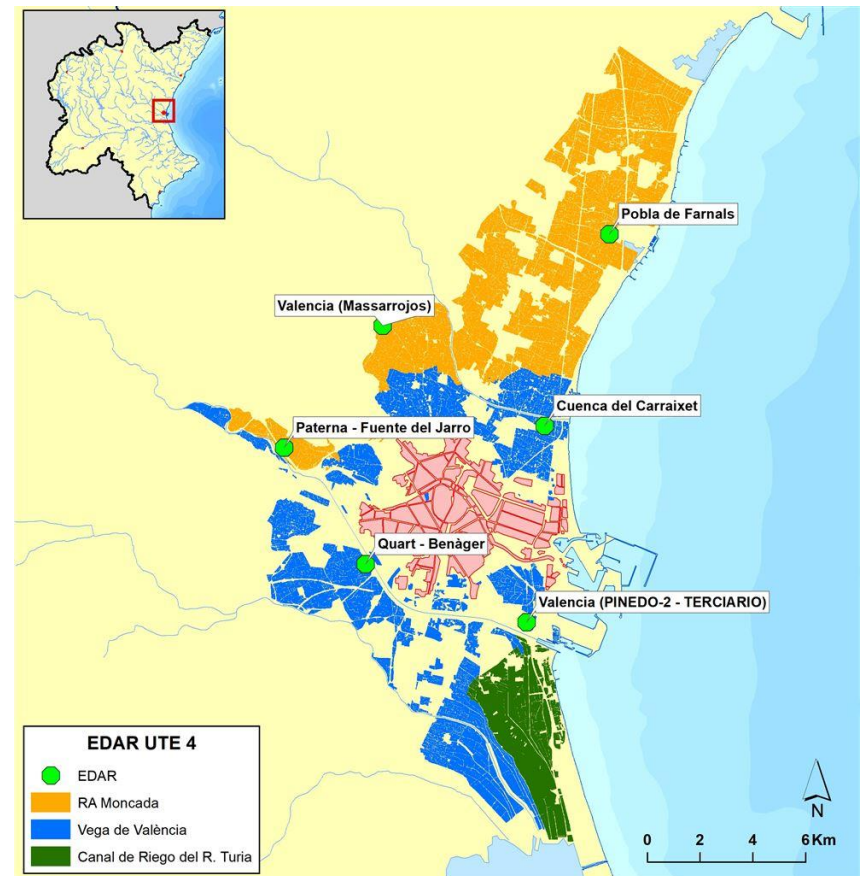
Water scarcity status index in the Júcar system

		Normal		Prealert -Alert		Emergency	
		Turia	Júcar	Turia	Júcar	Turia	Júcar
Water scarcity status index in the Turia system	Normal	20%	80%	35%	65%	50%	50%
	Prealert - Alert	10%	90%	20%	80%	40%	60%
	Emergency	0%	100%	10%	90%	20%	80%

Examples of specific measures: non-conventional resources

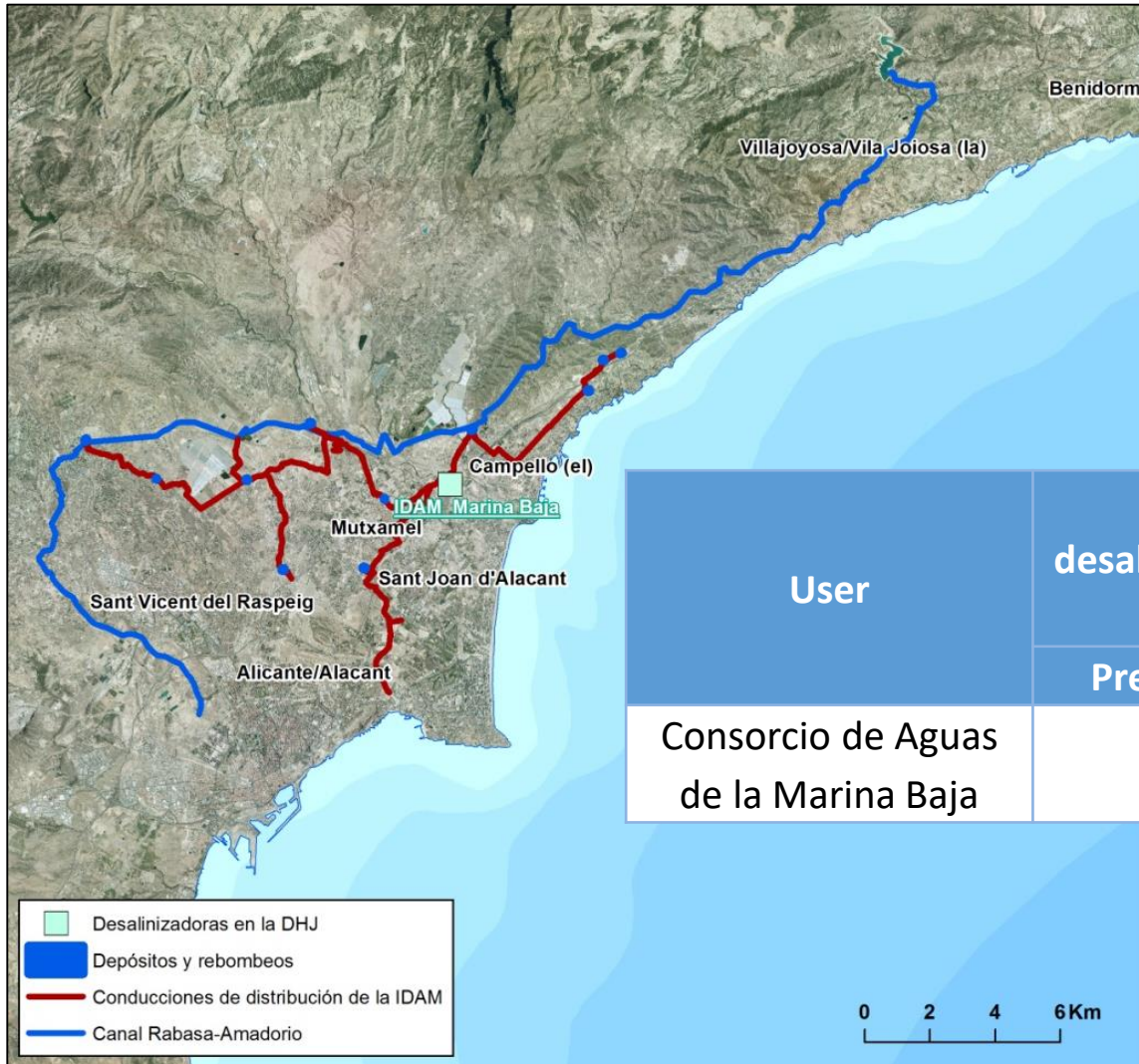
Intensification of the possibilities of using new resources contributed by reuse from the WWTP of the system, especially of the Carraixet Basin, Paterna-Fuente del Jarro, Pinedo, Pobla de Farnals and Quart-Benàger.

- As established in the regulations, the River Basin Management Plan, in situations where the scarcity index reaches the pre-alert status, will encourage the use of these resources by the irrigation system according to their current licences.



Examples of specific measures: non-conventional resources

Volumes from desalination according to scenario in UTE 8 Marina Baja.



User	Volume from the Mutxamel desalination plan according to scenario (hm ³ /year)		
	Prealert	Alert	Emergency
Consorcio de Aguas de la Marina Baja	0	2-5	6 - 11,5

Examples of specific measures: environmental impact reduction

Specific environmental measures in the emergency scenario in UTE 5 Júcar

Status	Measures to adopt	Competent Authority
Emergency	Reinforcement of surveillance actions for the conservation and protection of resources and aquatic ecosystems considering the protection of wetlands and fluvial species and the impact of other measures on the natural environment with special attention to L'Albufera of València, the middle stretch of the Júcar as it passes through La Mancha plain and the final stretch of the river, downstream of the Tous dam, including the Massalavés spring.	CHJ, GV y JCCLM
	Application of specific monitoring programmes to record the environmental impacts associated with critical episodes, with special attention to L'Albufera of València, the middle section of the Júcar as it passes through La Mancha plain and the final section of the river, downstream of the Tous dam, including the Massalavés spring.	CHJ, GV y JCCLM

In order to safeguard environmental conditions, a minimum volume is set for exploitation purposes, and in all cases environmental management measures must be initiated as volumes close to the indicated value are reached.

Dam	Minimum volume (hm ³)
Alarcón	30
Bellús	6
Contreras	15
Forata	0,75
Tous	39

**EMERGENCY PLANS FOR URBAN
SUPPLIES WITH MORE THAN
20,000 INHABITANTS**

Emergency plans for urban Supplies > 20.000 inhabitants

Article 27 of *Law 10/2001, of July 5, of the National Hydrological Plan*, dedicated to drought management, establishes the following in its section 3 :

“Public administrations responsible for urban supply systems that attend, **singularly or jointly, a population equal to or greater than 20,000 inhabitants** must have an **Emergency Plan in the event of drought**. Said Plans, which will be informed by the basin organisation or corresponding water administration, **must take into account the rules and measures provided for in the special plans** referred to in section 2, and must be operational within a maximum period of four years. ”

In the JRBD, **72 supply systems** have been identified: 65 municipalities with more than 20,000 inhabitants and 7 associations or consortiums that supply groups of municipalities with more than 20,000 inhabitants.

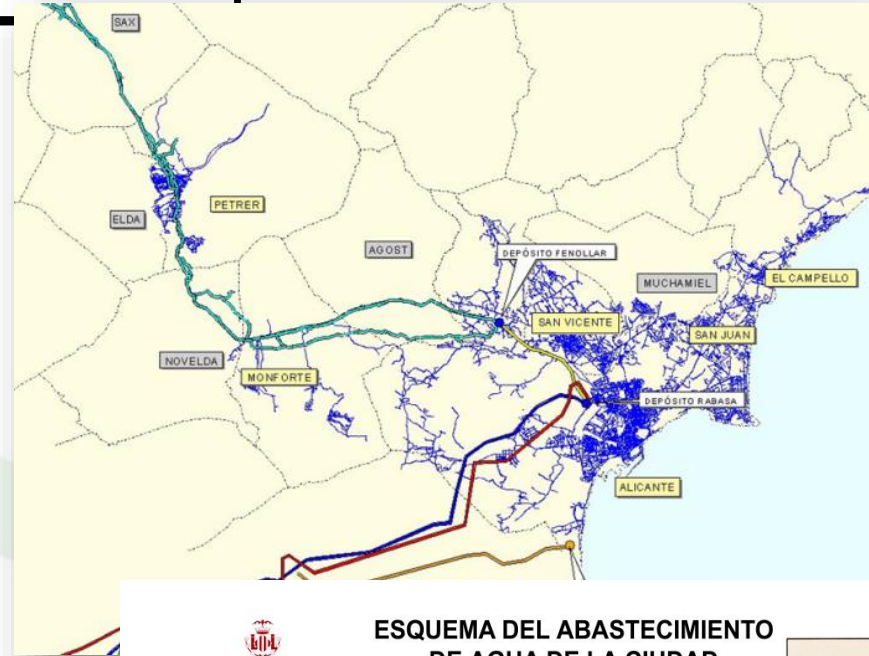
Despite it is not obligatory, it is recommended that municipalities with less than 20,000 inhabitants write EPs, as it is a useful tool to anticipate problems.

Basic contents of EPs according to the Instruction

The SDP establishes that the **basic contents of the Emergency Plans (EPs)** must include the following aspects:

- a) Regulatory and institutional framework applicable to the supply system.
- b) Identification and description of the set of elements and infrastructures that supply the urban nucleus.
- c) Definition and description of available resources.
- d) Definition and description of demands.
- e) Rules of operation and supply areas of the system.
- f) Identification and analysis of the greatest risk areas and circumstances.

Some examples



Basic contents of EPs according to the Instruction

- g) Definition and description of short-term EP scenarios.
- h) Analysis of the coherence between EP and SDP:
 - I. Correspondence of the indicators, thresholds and shortage scenarios adopted in the Emergency Plan with those defined in the Special Drought Plan.
 - II. Coherence of the measures proposed in the Emergency Plan with those in the Special Drought Plan. In particular, the Emergency Plan will define both the reductions with respect to the total demand in Normal scenarios, and the alternative resources considered, for the different occasional scarcity scenarios.
 - III. Consistency with the environmental conditions of the River Basin Management Plan of the district and the Special Drought Plan, especially those referring to scarcity scenarios. Establishment of actions and necessary measures to mitigate the effects of scarcity on the environment, ensuring - within the framework of its obligations and competences - compliance with these environmental conditions.
- i) *Economic analysis of cost of measures and impacts*

Relationship of indicators of SDP and EP

Supply system	Reference indicator proposal	
	Code	Name
Albacete	VE07	Volumen embalsado en Alarcón, Contreras y Tous
Alcoy/Alcoi	VE08	Volumen embalsado en Beniarrés
Alicante/Alacant	IEE UTE 9	Índice de estado de escasez de la UTE 9 Vinalopó-Alacantí
Almansa	IEE UTE 5	Índice de estado de escasez de la UTE 5 Júcar
Altea	VE09	Volumen embalsado en Amadorio y Guadalest
Bétera	IEE UTE 4	Índice de estado de escasez de la UTE 4 Turia
Calp	PL05	Pluviómetros Marina Alta
Campello, el	PL07	Pluviómetros Medio Vinalopó
Castelló de la Plana	PZ03	Piezómetro 08.12.014 Betxí
Cuenca	EA03	Estación foronómica 08032 Cuenca
Gandia	PZ14	Piezómetro 08.38.019 Gandia
Jávea/Xàbia	IEE UTE 7	Índice de estado de escasez de la UTE 7 Marina Alta
Llíria	PZ08	Piezómetro 08.19.004 Lliria
Ontinyent	PL04	Pluviómetros zona l'Olleria
Requena	PZ11	Piezómetro 08.24.005 Utiel
Sagunto/Sagunt	VE07	Volumen embalsado en Alarcón, Contreras y Tous
Sueca	IEE UTE 5	Índice de estado de escasez de la UTE 5 Júcar
Teruel	VE04	Volumen embalsado en el Arquillo de San Blas
Torrent	PZ10	Piezómetro 08.25.010 Aldaia
València	VE05	Volumen embalsado en Benagéber y Loriguilla
	VE07	Volumen embalsado en Alarcón, Contreras y Tous
Vila-real	PZ03	Piezómetro 08.12.014 Betxí
Villena	PL06	Pluviómetros Alto Vinalopó
Vinaròs	IEE UTE 1	Índice de estado de escasez de la UTE 1 Cenia-Maestrazgo
Consorcio de Aguas de la Marina Baja	IEE UTE 8	Índice de estado de escasez de la UTE 8 Marina Baja
Consorcio de Aguas del Camp de Morvedre	VE07	Volumen embalsado en Alarcón, Contreras y Tous
	PZ05	Piezómetro 08.20.014 Sagunto
	PZ06	Piezómetro 08.21.005 Sagunto
Consorcio de Aguas de la Marina Alta	IEE UTE 7	Índice de estado de escasez de la UTE 7 Marina Alta
Entidad Metropolitana de Servicios Hidráulicos	VE05	Volumen embalsado en Benagéber y Loriguilla
	VE07	Volumen embalsado en Alarcón, Contreras y Tous
Mancomunidad de los Canales del Taibilla	IEE UTE 9	Índice de estado de escasez de la UTE 9 Vinalopó-Alacantí
Mancomunitat de Municipis de La Safor	PZ14	Piezómetro 08.38.019 Gandia
Comunidad de Usuarios de la Ribera del Júcar	VE07	Volumen embalsado en Alarcón, Contreras y Tous

Main measures

- Act during normal status:
 - Avoid leaks in supply networks
 - Diagnose of supply weaknesses
- During drought:

DEMAND MANAGEMENT	SUPPLY MANAGEMENT
-Customer management: fraud search,...	-Put into operation emergency wells
-Rationalization of uses: information on invoices, web, customer service,...	-Negotiation of temporary rights or exchanges of rights
-Information campaigns	-Increase use of reuse water
-School Campaigns	-Increase use of desalinated water
-Adaptation of tariffs by sections of consumption	-Increase pumping rate
-Restrictions on secondary uses	-Increased efficiency, reduce pressure,...

Awareness campaigns

AJUNTAMENT DE VALÈNCIA
REGIDORIA DEL CICLE INTEGRAL DE L'AIGUA

Unió de Consumidors i Consumidores de la Comunitat Valenciana
global omnium
aigua de valència

No deixes córrer l'aixeta

Cada gota és vida

Campanya de Sensibilització sobre Estalvi d'Aigua

Il·lustrador col·laborador: Vicenç Ramires

**IT'S RUNNING OUT
SAVE WATER**

"Cada gota cuenta"

"Repara las goteras"

**SAVE WATER,
SAVE THE LIFE ON EARTH**

Thank you for your attention!

