Works in Loriguilla Dam, www.chj.es

Kick-off Meeting of the 2013 Halting Desertification in Europe Pilot Projects

Results of the 2011 project: Halting Desertification in the Júcar River Basin (HALT-JÚCAR-DES)

Brussels, 4 February 2014

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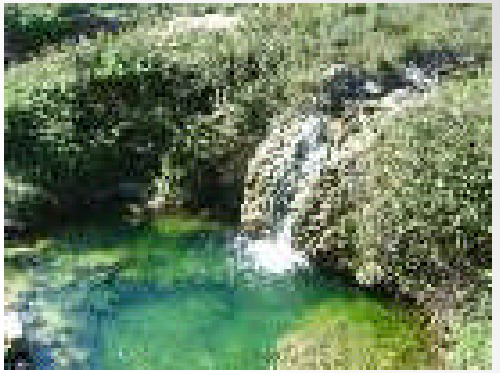
Introduction to the project



Júcar RBD

- Three partners were involved: EVREN (SME), EMWIS (International network), Júcar River Basin Authority (Gov.).

- Scale: Jucar River basin District, in the east of Spain (pilot RBD in the fist stage of the WFD implementation).
- Aim: obtain and assess environmental and climatic data, use systems/models and provide recommendations to save water resources.
  - **Water Accounts**
- Transfer results: dissemination to EU and non-EU countries through EMWIS.
- Duration: Dec 2011-March 2013

The Jucar RBD

- Surface: 42.851km^2. Population (2009): 5,1 million.
- Mediterranean climate (average temp. 14-16ºC; average annual rainfall 500 mm).
- High season variability.
- Relevant groundwater resources.
- Water scarcity & droughts.
  - Drought management plan since 2007.
- Desertification: overexploitation of aquifers and salinization of soils.
- Relevant demographic and touristic pressures.
- <u>A river basin facing most of the water resources challenges!</u>

Developed Tasks

1. Establishment of background and context.
2. Collection of data and contacts with administrations and other partners.
   - Data delivery feasibility, improvement of datasets. Collection from: Júcar RBA, Ministry of Agriculture, Food and Environment (MAGRAMA), National Statistics Institute (INE), National Meteorological Agency (AEMET), National Water System (SIA), CEDEX, IGN, ECRINS (EEA), EIONET, EUROSTAT…
3. Application of method by SEEAW and ECRINS specifications.
   - Disaggregation, detailed water resources balance, identification of measures. Preliminary water accounts.
4. Assessment and recommendations.
   - For data gathering, future projects, river basin authorities, implementation of water accounts tables…
5. Meetings and deliverables.
6. Dissemination and capacity building.
   - Web-site section EVREN, EMWIS e-bulletin and website, brochure, attended international events, workshop with the participation of non-EU countries.

Results

- Several technical **reports**: background report, 3 follow-up reports, recommendations report, FEC revision, Precipitation data & scale zones report, final report…
- Meetings results.
- Data feasibility table.
- Web-sites sections.
- **Water accounts SQL Data base.**
- **Water accounts** (balances) for the series 2001-2010, per month and at sub-basin scale, also as Excel pivot table. SEEA-Water tables VI.1, VI.2.
- Maps and graphs to represent gathered data (better way for presenting results to the public).

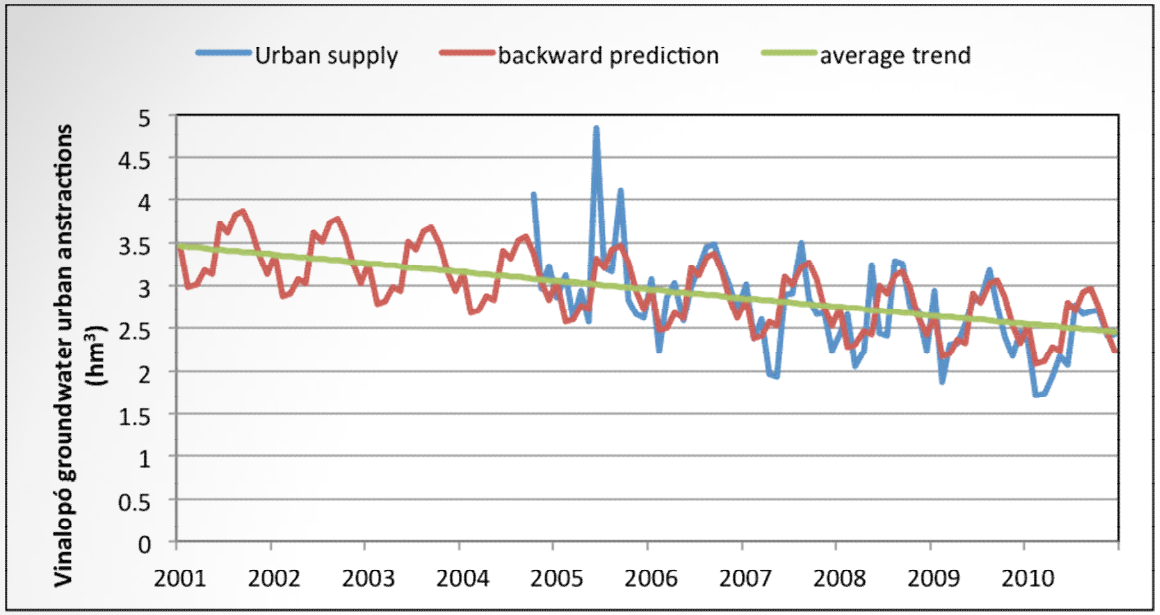
	Element					
Variable	1311 Reservoir	1312 Lakes	1313 Rivers	132 Groundwater	133 Soil	Total
StateInitial	**942**	**0**	**1 412**	**1 840**	**5 189**	**9 383**
ReturnHydropower			674			674
ReturnIrrigation			28	63		91
ReturnUrbanSupply			44			44
Precipitation	4	0	6		2 047	2 057
FromArtificialReservoirs			140			140
FromGW			202			202
FromRivers	128			53		181
FromSoilWater			44	159		203
Evapotranspiration	-4	0	-6		-1 452	-1 463
AbsHydropower			-674			-674
AbsIrrigation			-131	-155		-286
AbsRainFedAgr					-460	-460
AbsUrbanSupply			-3	-56		-59
ToArtificialReservoirs			-128			-128
ToGW			-53		-159	-212
ToRivers	-140			-202	-44	-386
ToSeaTotal			-122	-56		-178
OtherLosses			-17			-17
Final State	**929**	**0**	**1 417**	**1 645**	**5 121**	**9 112**

Example of water accounts table (Mijares-La Plana de Castellón WMS, year 2001)

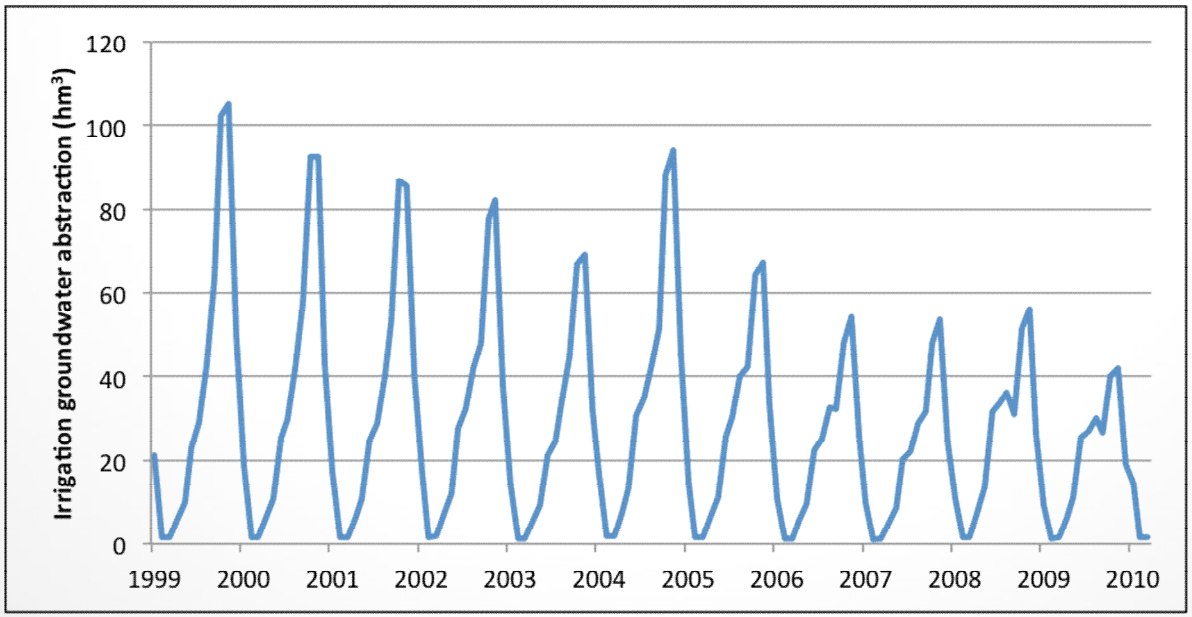
(Millions of cubic meters)						
	EA.1311 Artificial reservoirs	EA.1312 Lakes	EA.1313 Rivers	EA.133 Soil water	EA.132 Groundwater	Total
3. Precipitation	58	11	6	9 222		**9 297**
4.b. From other resources in the territory	2 566		4 574		629	**7 768**
5. Abstraction			-401	-2 536		**-2 937**
6. Evaporation/actual evapotranspiration	-53	-10	-6	-5 918		**-5 987**
7.a To other territories			-103			**-103**
7.c. To other resources in the territory	-2 645		-2 566	-629		**-5 839**
Total general	**-74**	**1**	**1 505**	**139**	**629**	**2 200**

Example of water account table for the whole basin, dry year (upper table) and humid year (bottom table)

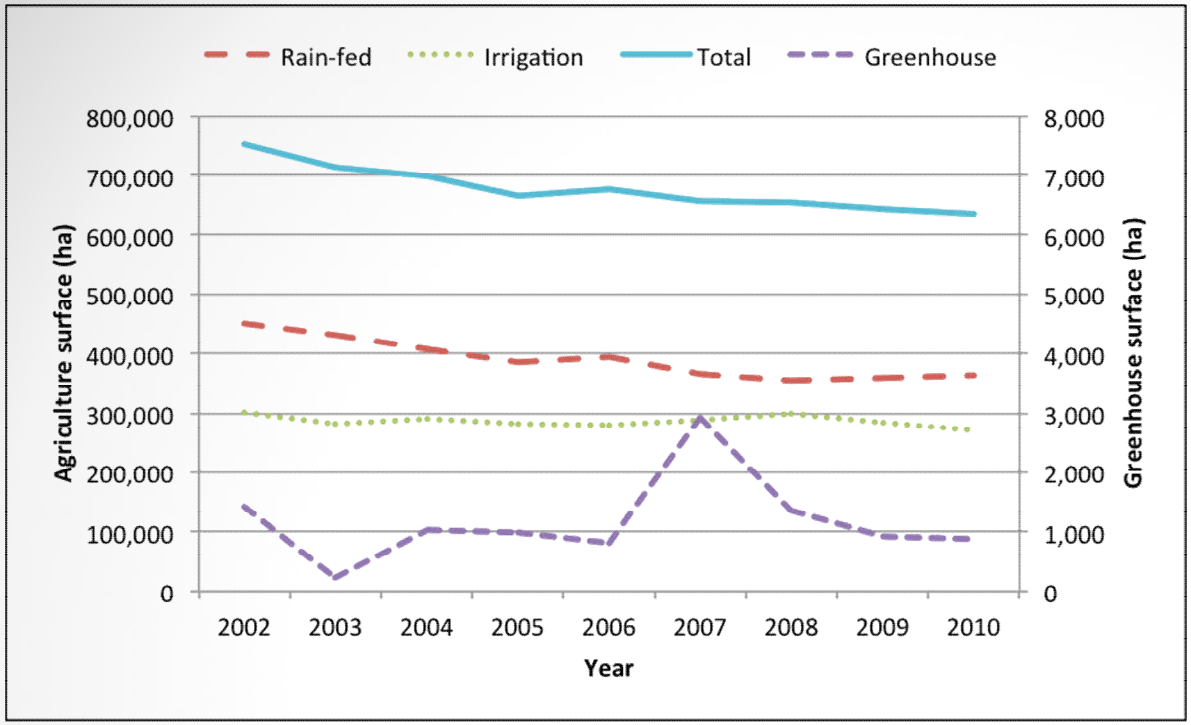
(Millions of cubic meters)						
	EA.1311 Artificial reservoirs	EA.1312 Lakes	EA.1313 Rivers	EA.133 Soil water	EA.132 Groundwater	Total
3. Precipitation	87	16	9	13 716		**13 827**
4.b. From other resources in the territory	2 826		6 155		1 573	**10 554**
5. Abstraction			-509	-2 960		**-3 468**
6. Evaporation/actual evapotranspiration	-62	-12	-6	-6 906		**-6 986**
7.a To other territories			-108			**-108**
7.c. To other resources in the territory	-2 634		-2 826	-1 573		**-7 033**
Total general	**216**	**5**	**2 716**	**2 277**	**1 573**	**6 786**



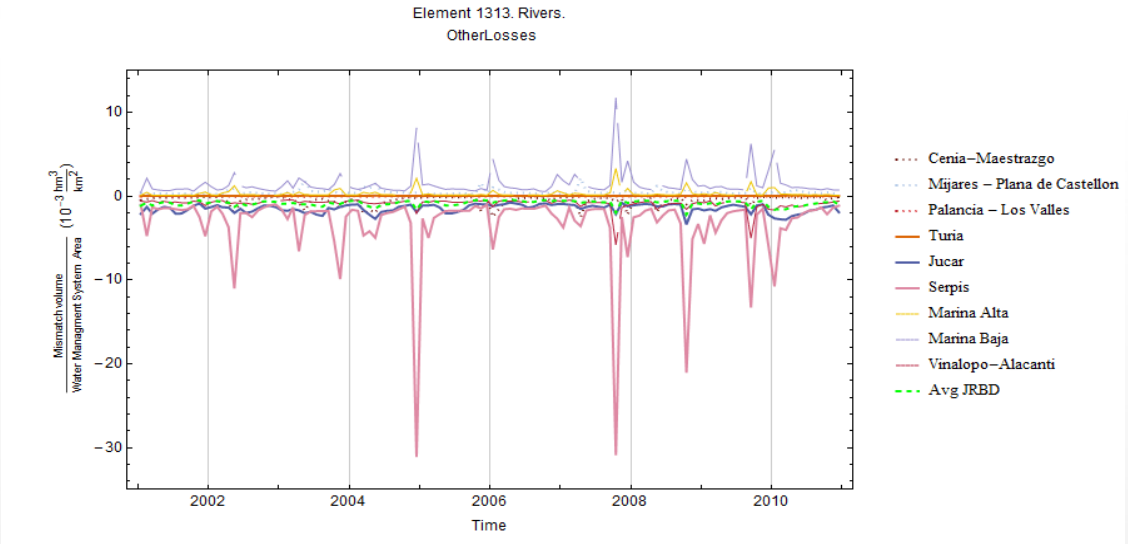
Estimated evolution of groundwater withdrawals for urban supply and backward forecast for nonexistent data at the beginning of the period.



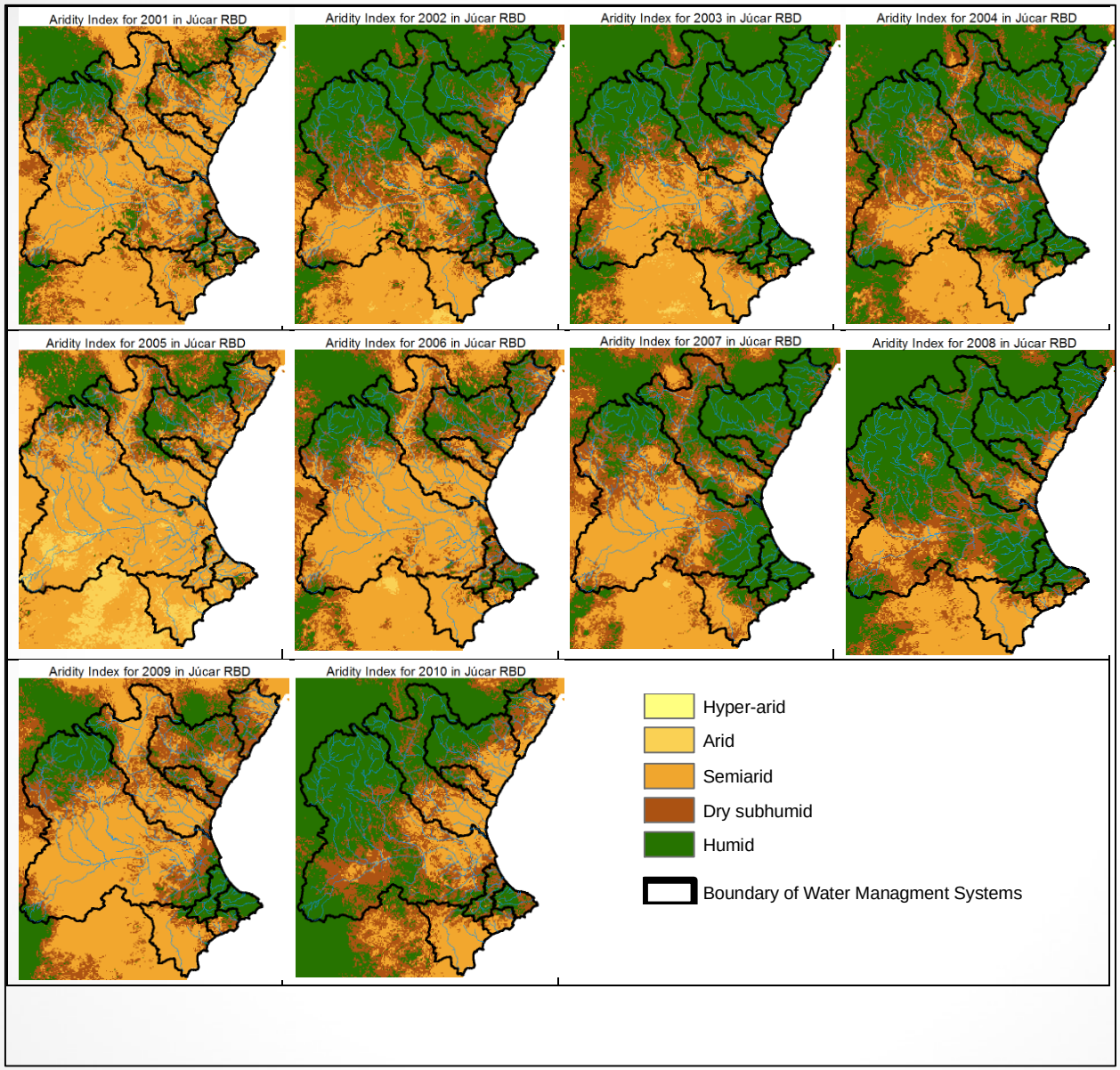
Evolution of groundwater withdrawals for irrigation in Mancha Oriental aquifer.



Evolution of productive agricultural area in the Valencia Region



Other losses computed to make constant the trend of stored volume in rivers. Comparison between distinct WMS.



Aridity Index (UNEP) for period 2001-2010 comparison in the Júcar River Basin District.

Comparison between piezometer levels and stored volume in Vinalopó-Alacantí WMS. Value of piezometers relatives respect to the initial value of the period.

Encountered problems / Approaches (1/2)

Júcar RBMP was still under development. (SWMI scheme under consultation, most technical works developed during the past 5 years), due to political issues in the district definition.	Officially approved or publically available data were used (most recent 2009). Also the CE provided an extension of three months.
The same parameters were sometimes monitored from various entities and sometimes with different tools (several series exist)	Cross-check of series was done, determining if there were large discrepancies.
Data robustness depending on source. Increase of uncertainty if aggregated area is smaller.	The most reliable data were used (in agreement with CHJ). Still 10% of uncertainty error in P.
“Demands” as such were not available yet (better control for surface waters than for GW).	Uses estimations and supplied volumes were incorporated (from former RBMP, Hydrological Planning Technical Guidance, surveys –AEAS, irrigation...-) and the use of SIMPA model.
Selecting the appropriate scale.	The “Sistema de explotación” (Water Management System) was used (management unit, union of sub-catchments) because it is the functional region that shares resources at the Jucar River Basin District. This scale may not work so well for larger basins.

Encountered problems / Approaches (2/2)

No recorded data for all parameters, or not at an appropriate temporal or geographical scale.	When needed, aggregated data or models were used (e.g. “PATRICAL”; simulation model for natural regime, developed by CHJ from the SIMPA model –CEDEX-).
Water use or economic data were not available at the same geographical scale.	In the Jucar RBD the economic data were available aggregated to region, in the best case to municipalities. That is how they were used.
Matching of the political-administrative and natural boundaries of the RBD.	Adjustments/estimations were done in agreement with CHJ indications.

Thank you!

Questions and comments:

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