GOBIERNO DE ESPAÑA
MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE
CONFEDERACIÓN HIDROGRÁFICA DEL JÚCAR

INTEGRATED WATER RESOURCES MANAGEMENT IN SPAIN: SOME CASE STUDIES IN JUCAR RIVER BASIN DISTRICT

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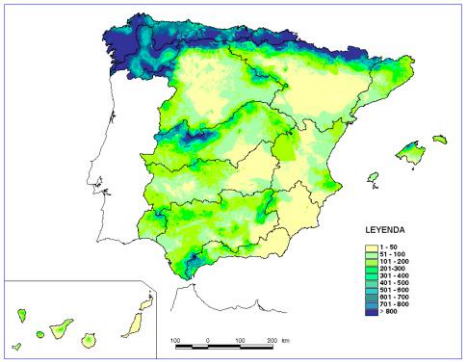
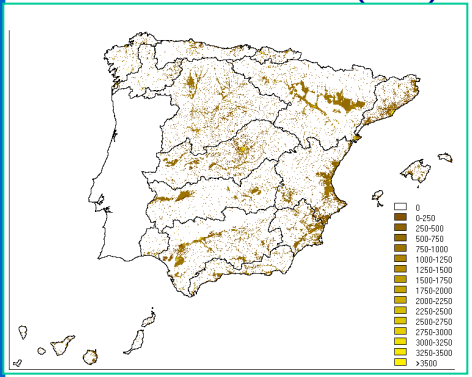
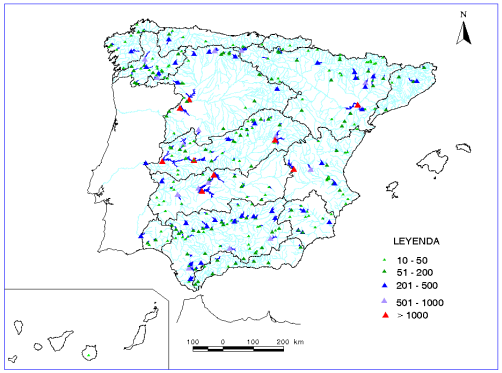
- Introduction
- Basin Management & Spanish River Basin Districts
- Integrated Water Resources Management (IWRM) approach
- IWRM Case Studies:
  - Vinalopó – Alacantí area
  - Mancha Oriental aquifer



Mean annual runoff (mm)



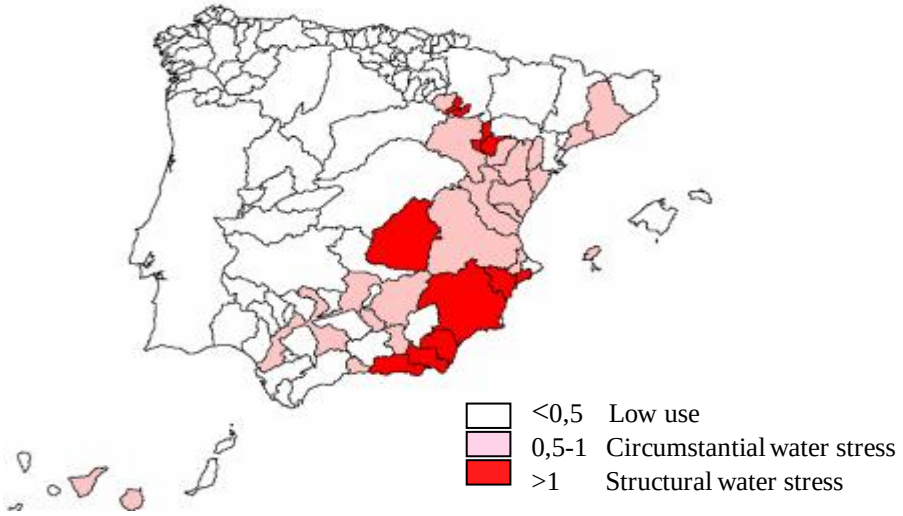
Mean annual water demand (mm)



Reservoirs > 10 hm^3

Water is a scarce resource in Spain

- High irregularity in time and space
- Limited water resource: conflicts among water demands
- Use of conventional and non conventional water resources



Water exploitation index: water consumption / available water resource

Long tradition in basin management

- Creation of the “Trading Hydrological Confederation of the Ebro river ” in 1926.
- Original associative formula between Administration and users to foster hydraulic works and water uses bearing in mind the river basin interests.

SPANISH RIVER BASIN DISTRICTS

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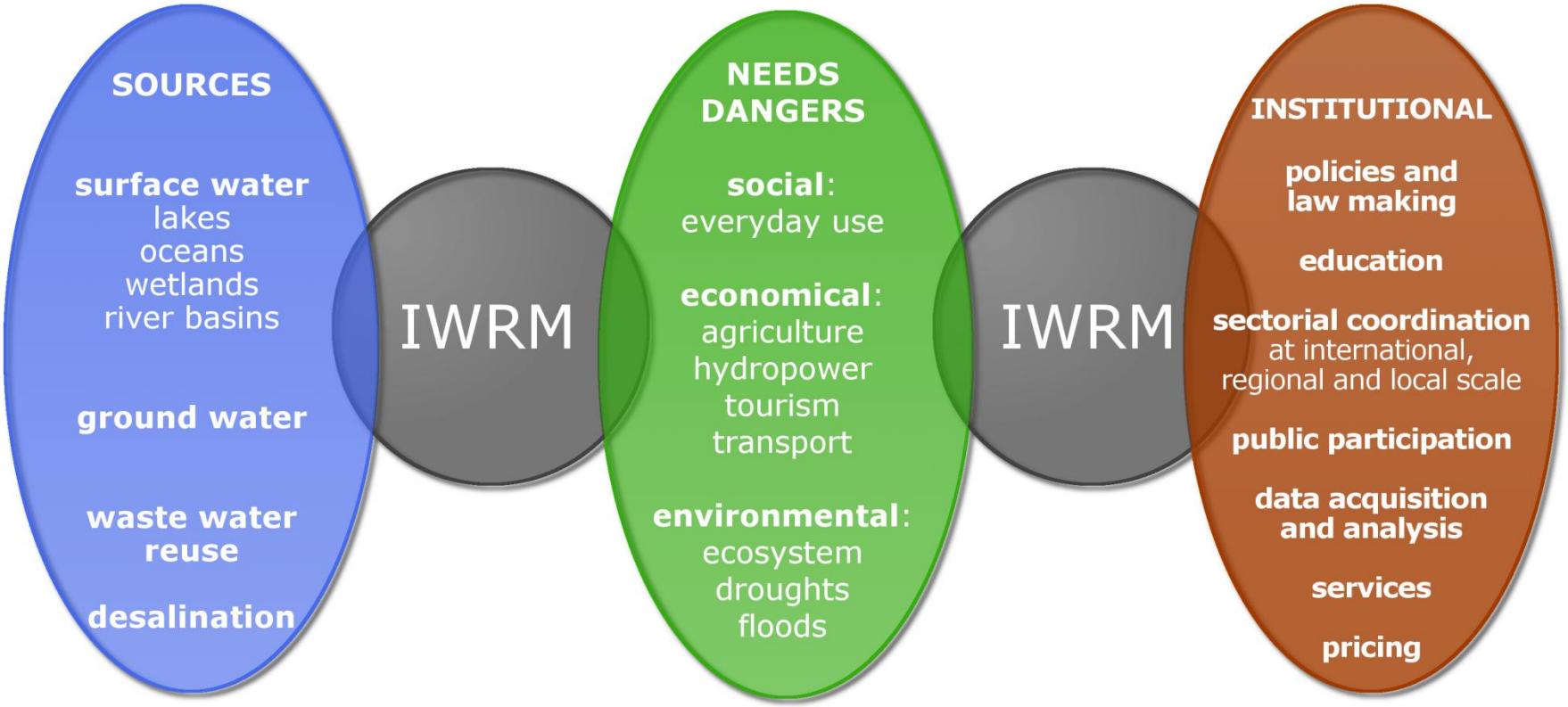
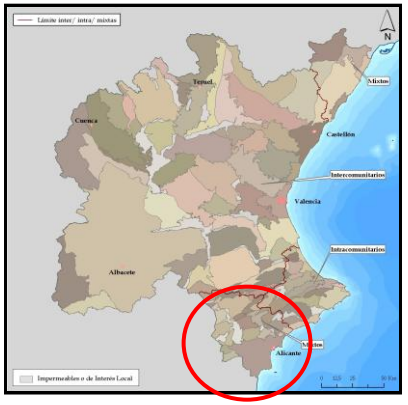
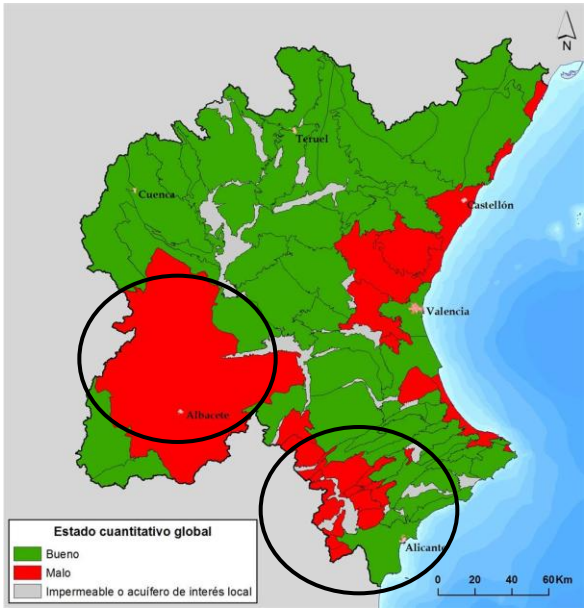
Integrated Water Resources Management (IWRM) Summary Chart



Mancha Oriental aquifer

Vinalopó – Alacantí Area



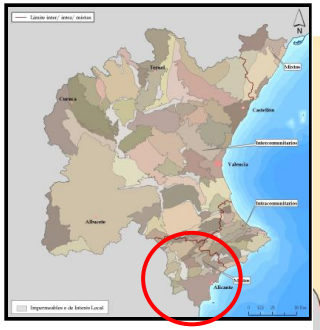


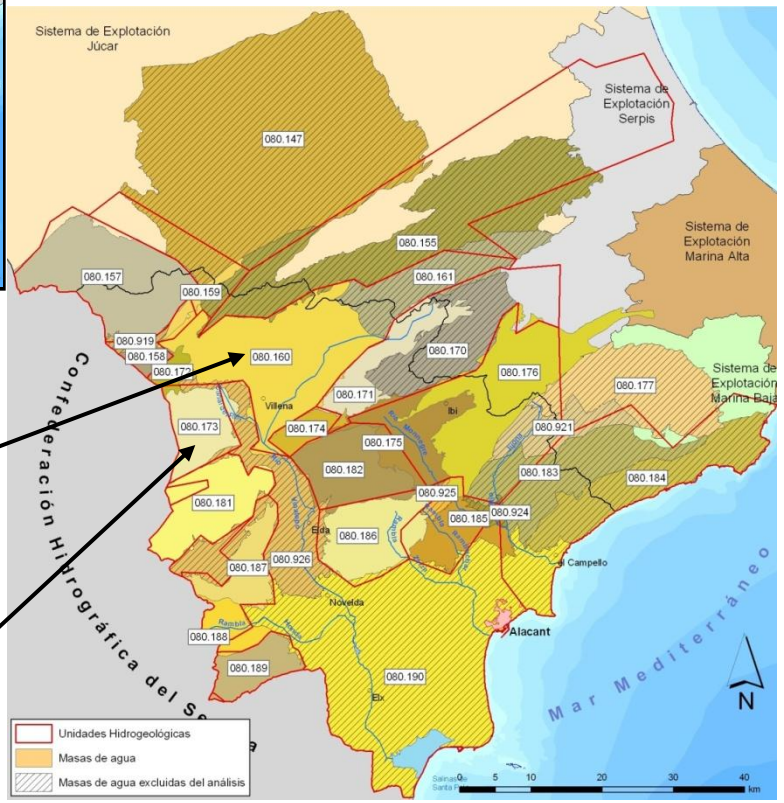
Groundwater bodies quantitative status

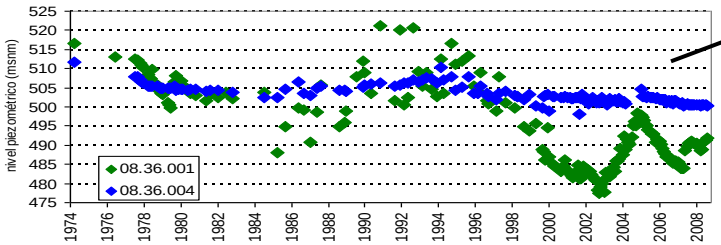
Vinalopó – Alacantí Area

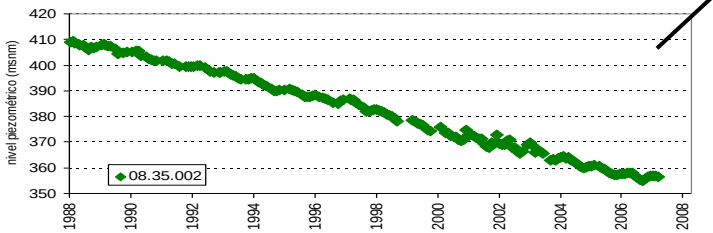
Vinalopó – Alacantí area

Severe decreases in aquifer water levels have occurred as a consequence of an intensive ground water exploitation for urban and agricultural uses

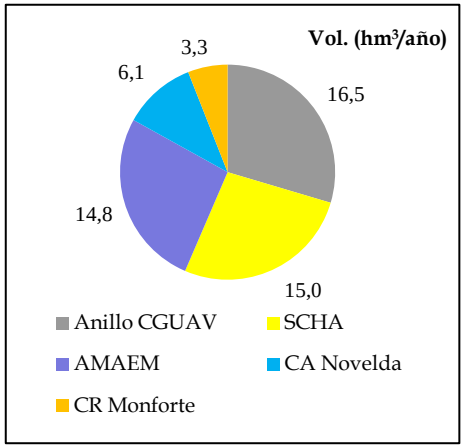








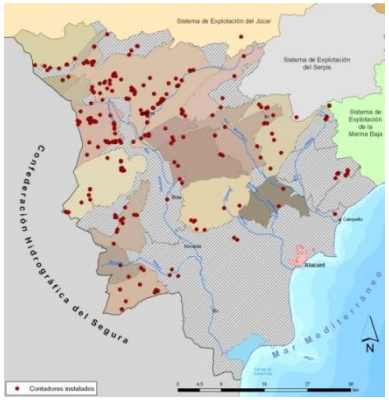
Main water distribution water pipes in the Vinalopó-Alacantí system

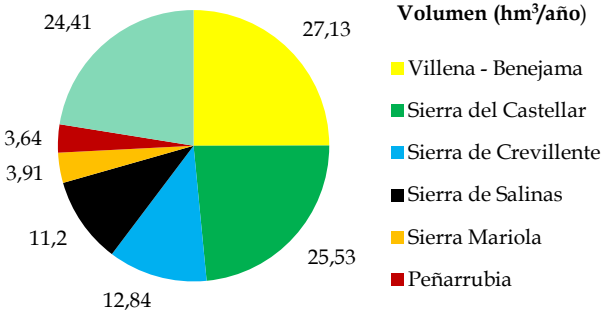


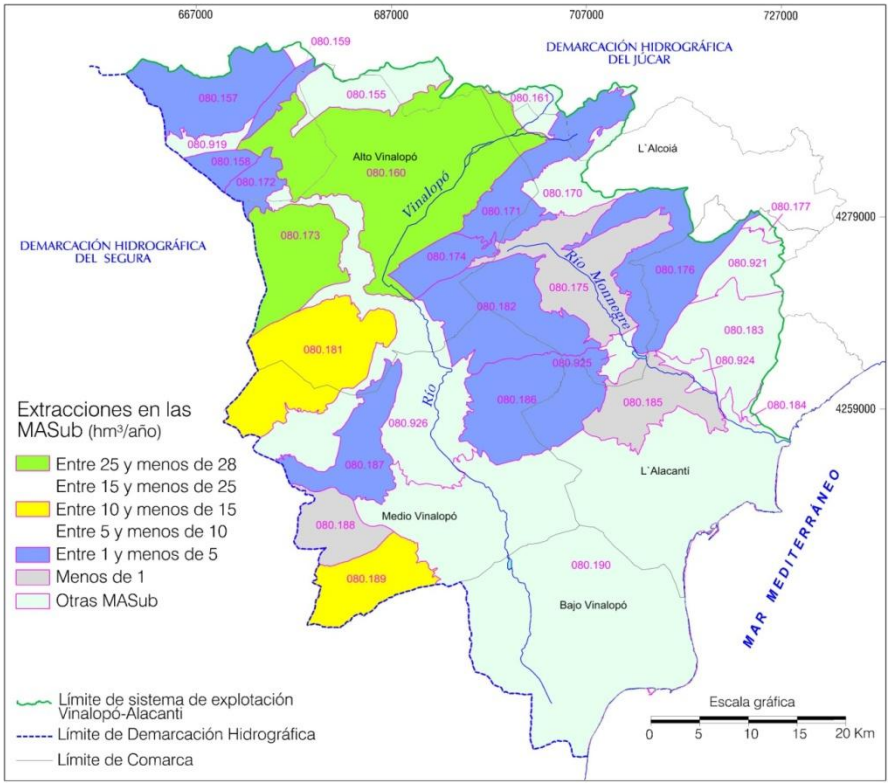
Distributed water volumes

Groundwater abstractions

- Total groundwater abstractions: 113 Mm3/year
  - agriculture: 73 Mm3/year
  - urban use : 40 Mm3/year
- 243 points for abstractions control (78% of total abstraction is measured)







Quantitative Groundwater body status

Renewable water resources

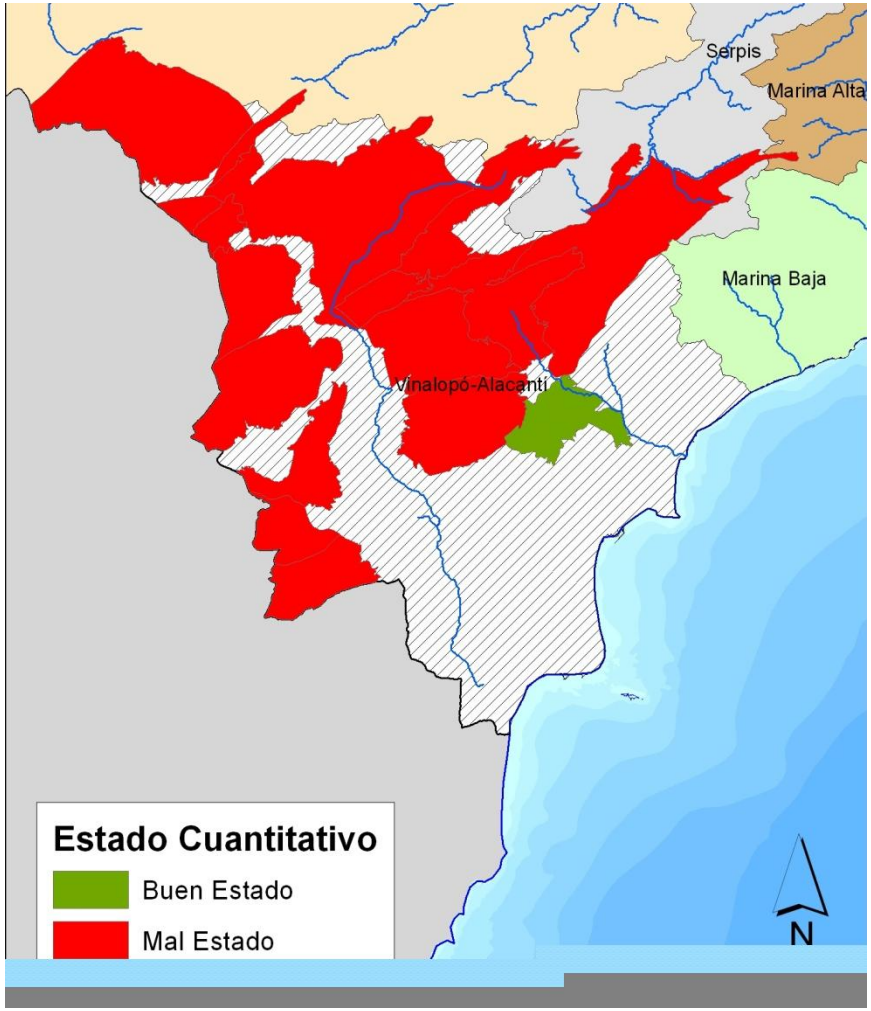
- Total resources 48 Mm^3/year
- Main resources are concentrated in the upper side of the basin

Quantitative Groundwater body status

- 16 GB in bad status
- only 1 GB in good status (Agost)
- Deficit groundwater abstractions: 65 Mm^3/year

Environmental Objectives (FWD):

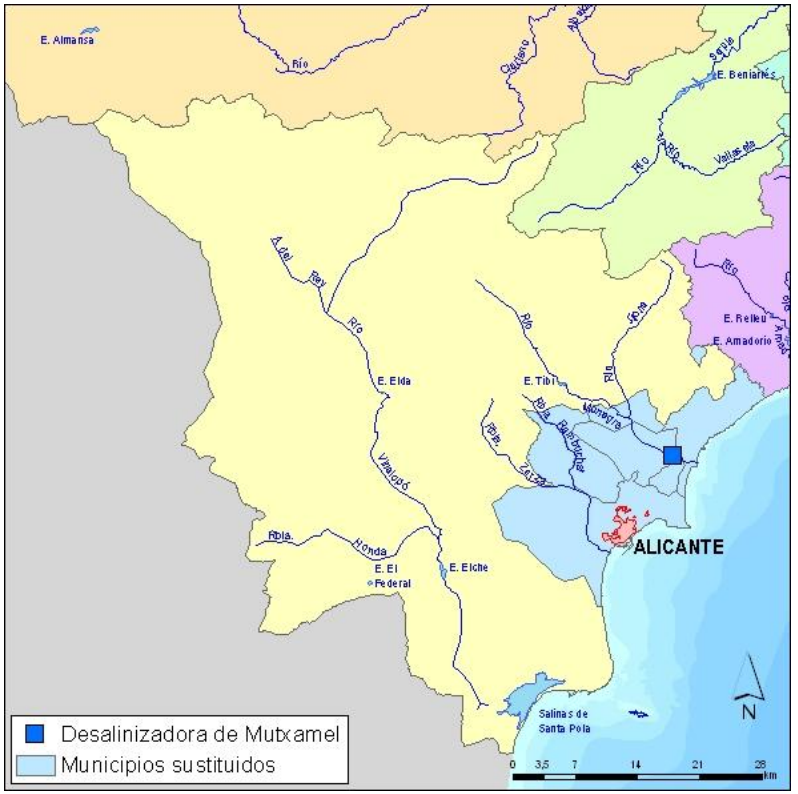
- Good status in 2027



Programme of Measures: Substitution of groundwater abstractions

Júcar- Vinalopó Water Transfer: 80 Mm3

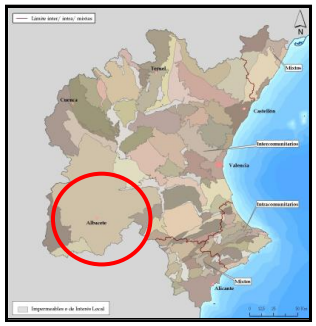
Mutxamel desalination Plant:18 Mm3

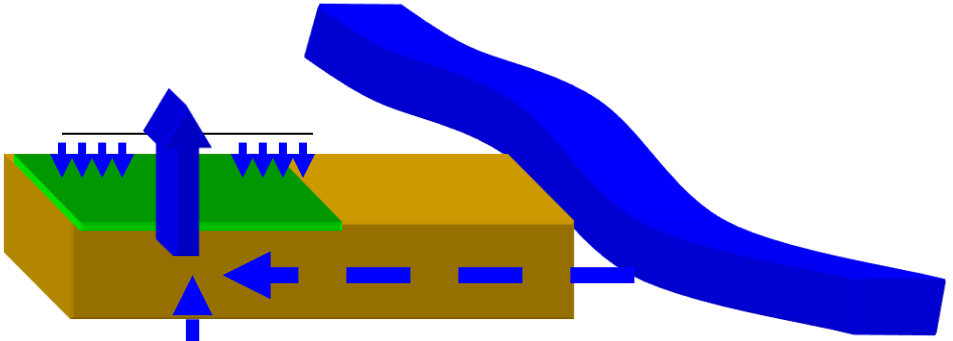


Importance of users ‘s association: Junta Central de Usuarios del Vinalopó-Alacantí y Marina Baja (JCUVAMB)

Mancha Oriental aquifer

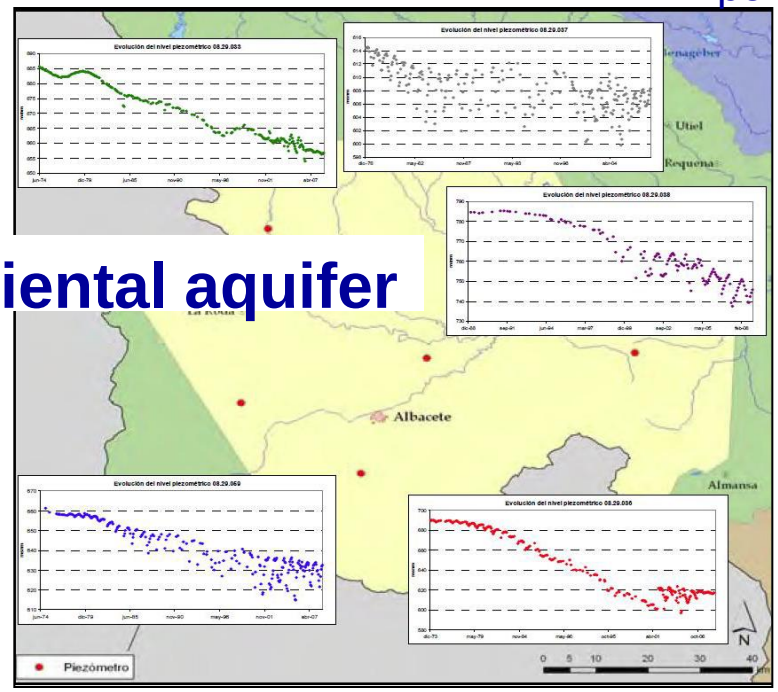
- Severe decreases in aquifer levels, have caused affections to water surface, and difficulties to guarantee water supply in existing exploitations, both urban and agricultural.





Important relationship river-aquifer

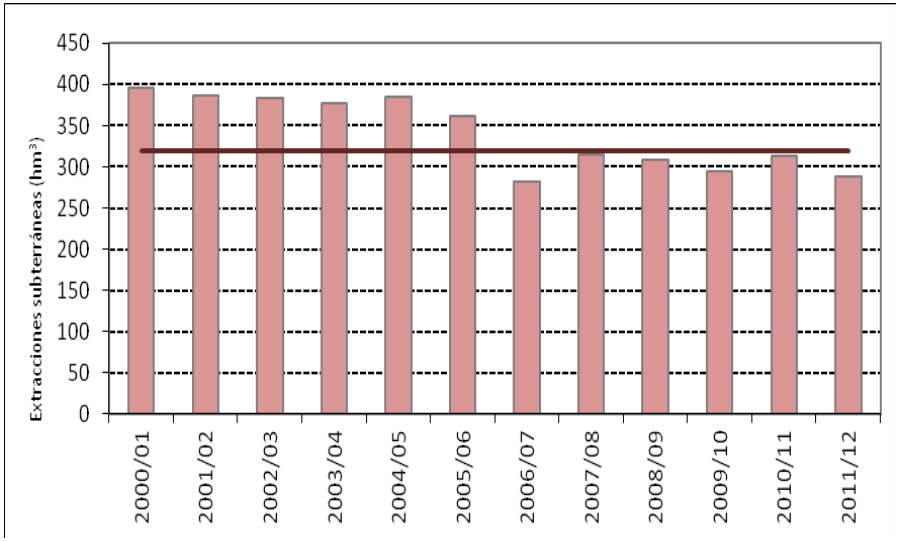
Mancha Oriental aquifer



Júcar River: drought 1994-95

Importance of controlling the groundwater irrigation abstractions

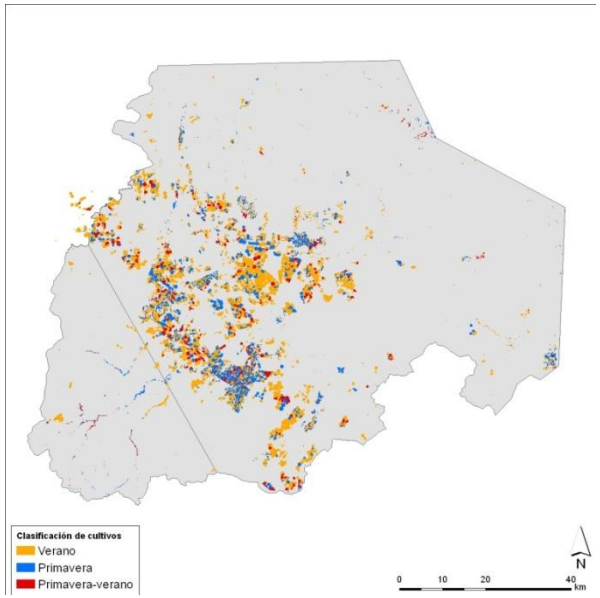
- Remote sensing analysis from 1996
- Water use criteria: Presidency of JRBA annual resolution
- Annual crop plan control by users (JCRMO)



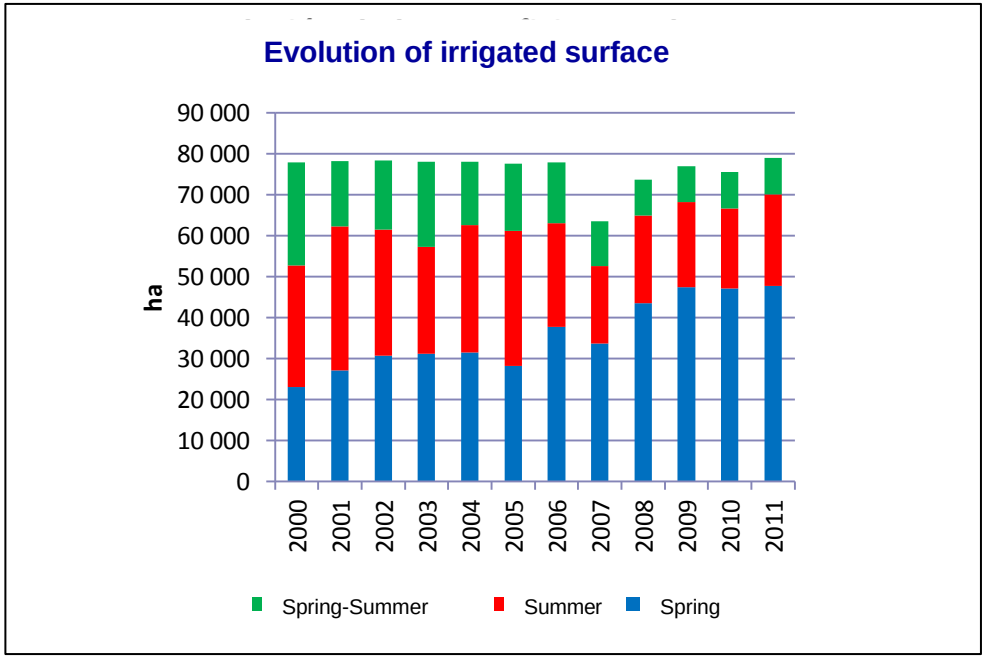
Evolution of Groundwater irrigation abstractions

Importance of users' association: Junta Central de Regantes de la Mancha Oriental (JCRMO)

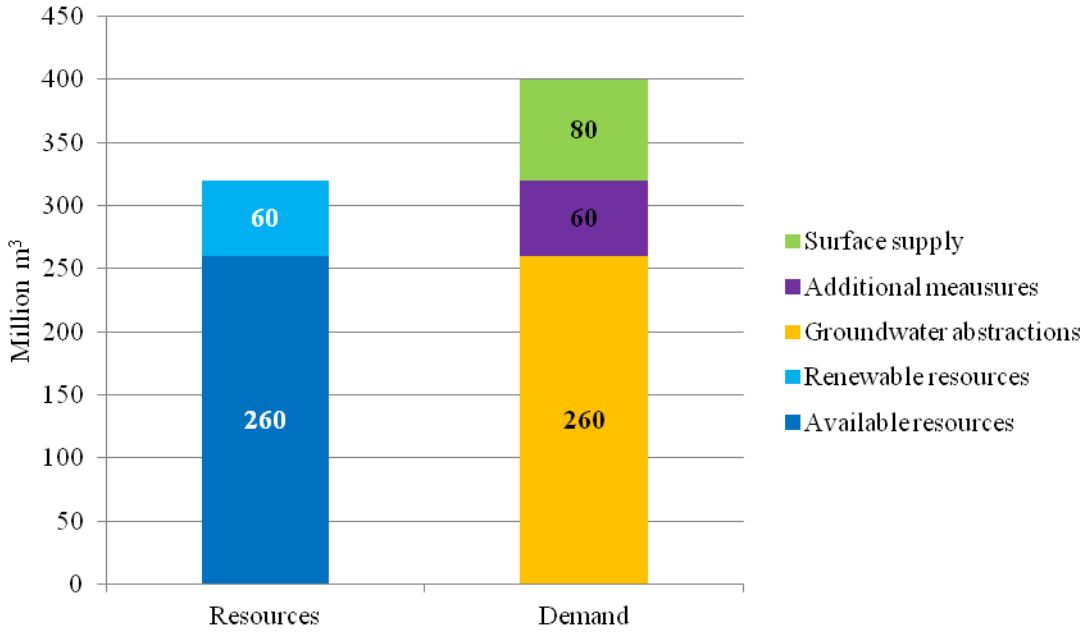
Detailed studies with remote sensing



- Joint Commission: participation of the Administration, Users and of the Universities

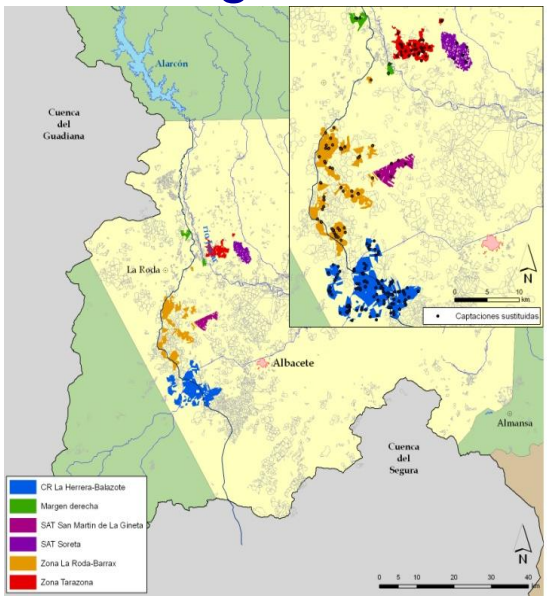


Need of equilibrate the balance of aquifer (RBMP)

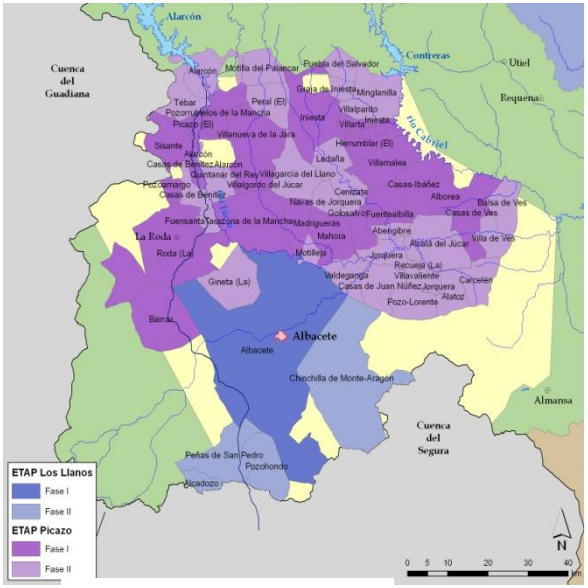


- Actual irrigation demand: 400 Mm^3
- Renewable resources 320 Mm^3
- Environmental restrictions 60 Mm^3
- Available resources 260 Mm^3
- Surface supply for irrigation 80 Mm^3
- Additional measures for irrigation (2027): 60 Mm^3
  - Additional surface supply
  - Water demand management measures

Programme of Measures



Irrigation



Urban

-Substitution of ground water resources by surface resources

- •Urban: Albacete and its influence area (30 Mm^3/year)
- •Agriculture: volume maximum of 80 Mm^3/year

-Modernisation of irrigated areas

-Exceptional measures for drought periods: acquisition of water right

- Measures for improving knowledge: groundwater modelling

How to improve IWRM

- use of water supply increase and water demand management measures.
- reaching a good status: monitoring systems.
- RBMP: users' associations & stakeholder participation
- balance environmental protection and sustainable economic development.

Thank you very much for your attention!