GOBIERNO DE ESPAÑA
MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE
CONFEDERACION HIDROGRAFICA DEL GUADIANA

FUNDACIÓN BOTÍN

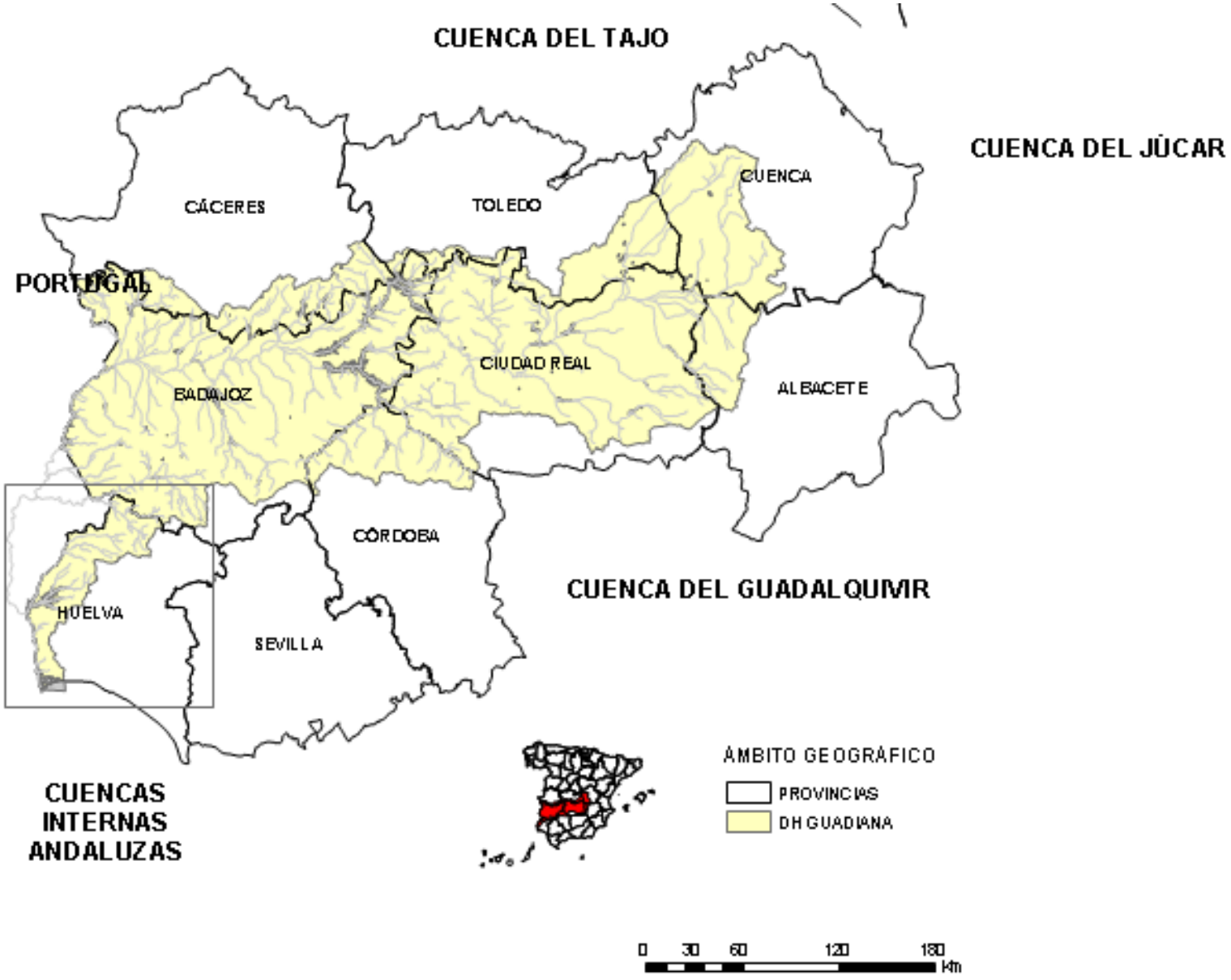
THE UPPER GUADIANA CASE

José Ángel Rodríguez Cabellos
Jefe de la Oficina de Planificación Hidrológica
GUADIANA RIVER AUTHORITY (CONFEDERACIÓN HIDROGRÁFICA DEL GUADIANA) Spain
oph@chguadiana.es

INDEX

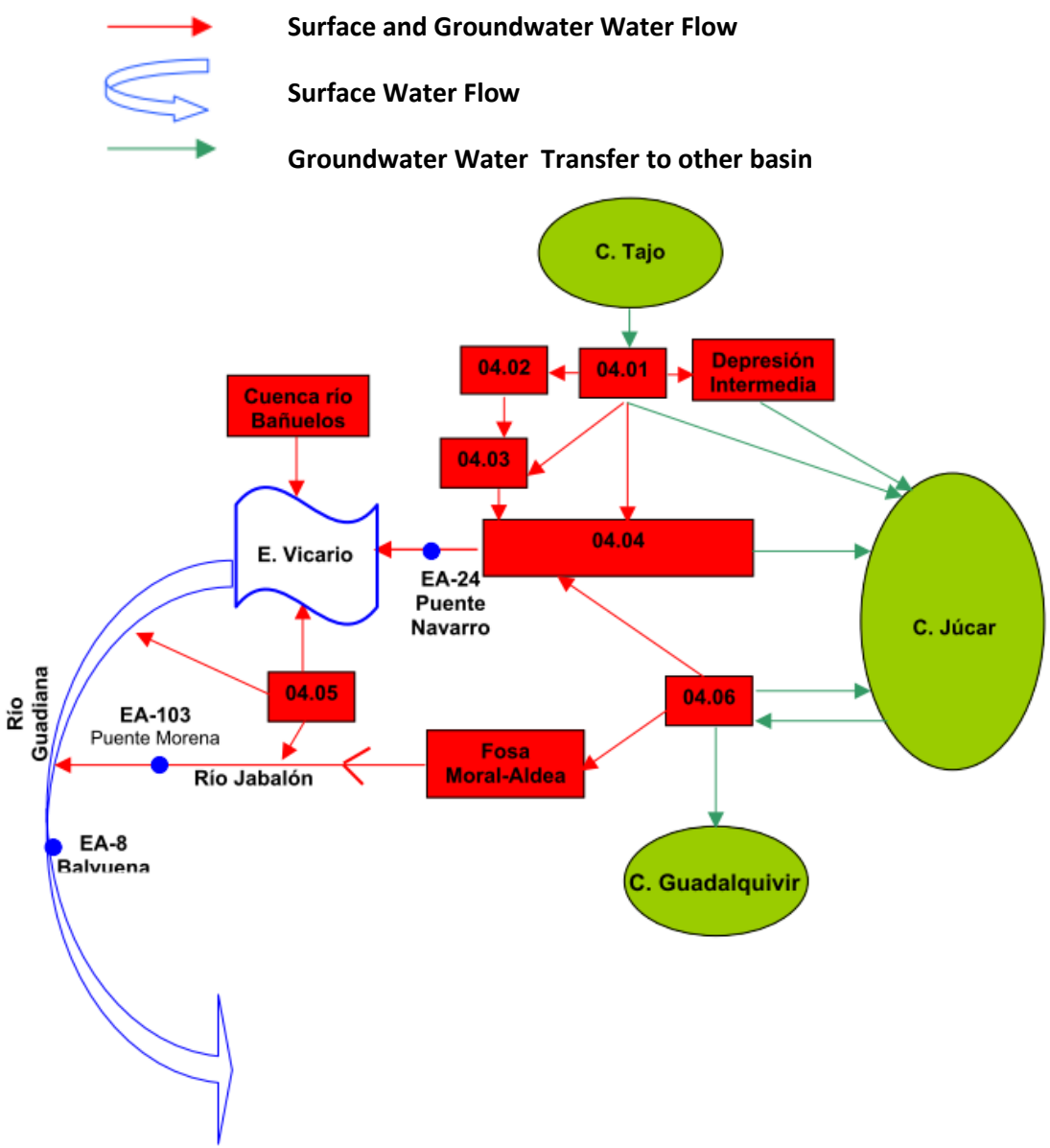
- Introduction
- The previous legal Framework to 1985
- Evolution until end of 80's
  - Declarations of "Aquifer Overexploitation"
  - 1992 Income Compensation Plan
  - 1998 Basin Management Plan (1998 Basin Hydrological Plan)
  - 2000 National Hydrological Plan
  - Water Framework Directive
  - 2008 Upper Guadiana Special Plan
  - Guadiana District Management Plan (River Basin Hydrological Plan) 2009-2015
- Quantitative status evolution since the declaration of overexploitation
- Conclusions

Introduction



Introduction

Groundwater flow diagram between Aquifers



Introduction

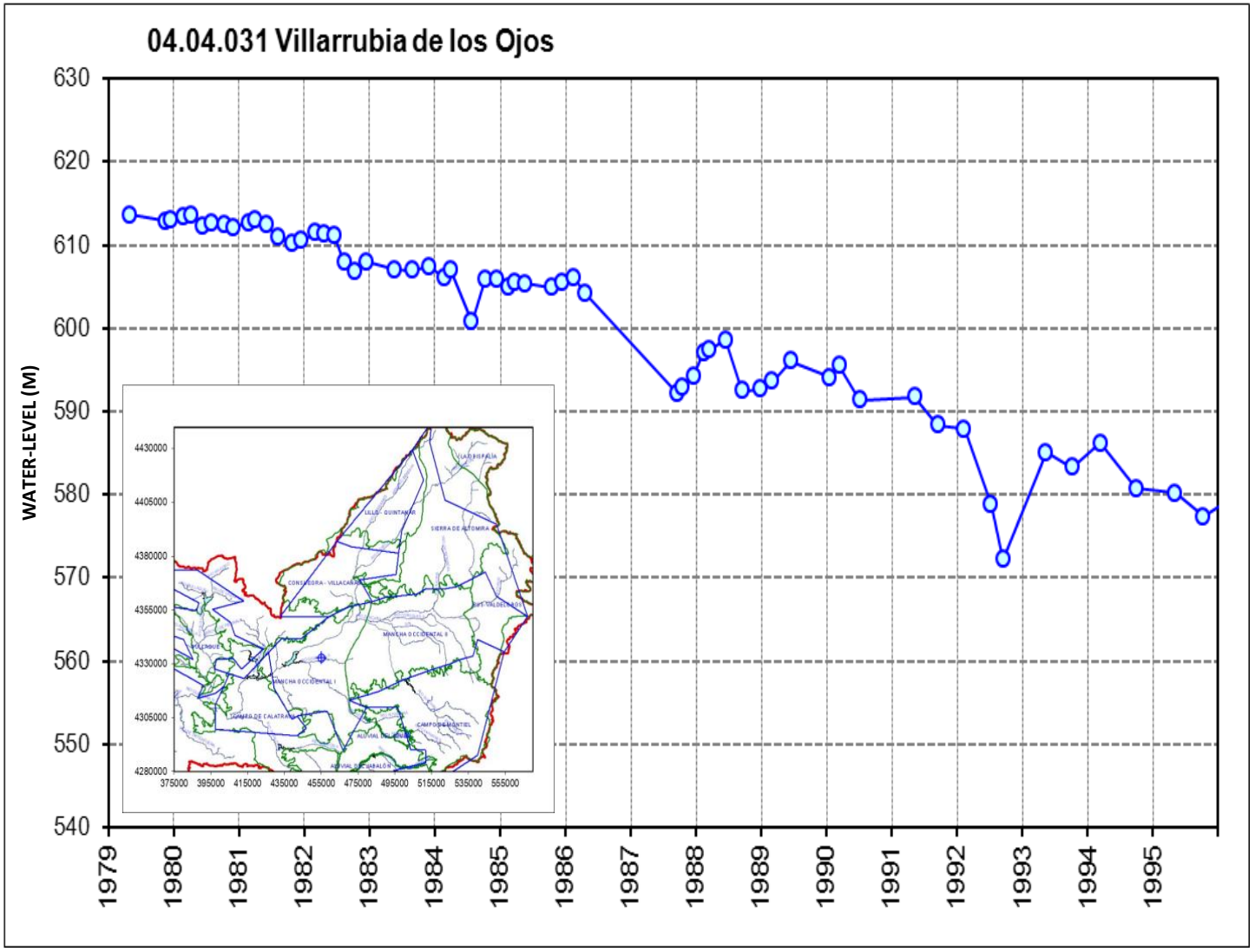
The previous legal Framework to 1985

- Ancient 1879 Water Law, groundwater as a private property.
- New 1985 Water law: groundwater public domain
- Allowed existing groundwater abstraction to continue, required register.
- Tens of thousands Registration applications (abstraction would far exceed available renewable resources).

Evolution until end of 80's

- From the 50's to the 70's, channelling and drying of wetlands to transform into farmlands
- In the 70's, intensive growth of irrigated areas from La Mancha Aquifers
- In the mid 70's, significant groundwater table depletion.
- In the mid 90's the storage deficit of La Mancha Occidental aquifer 4.000 hm^3.

Evolution until end of 80's

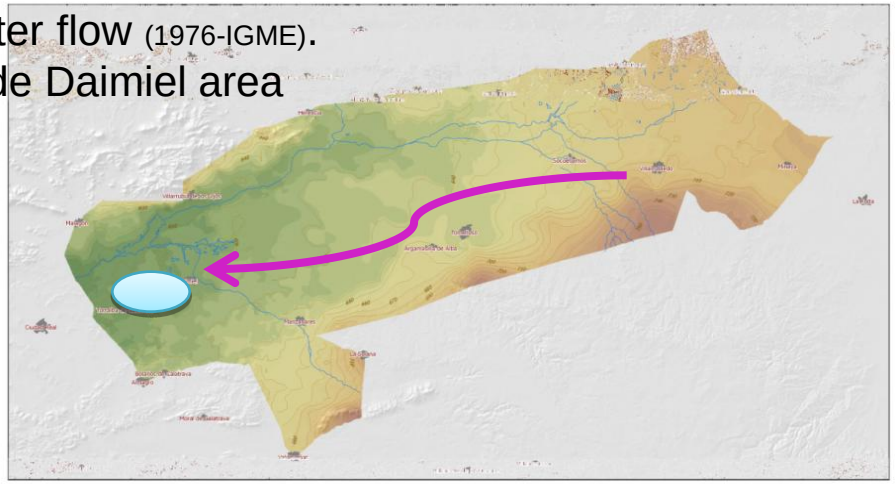


Evolution until end of 80's

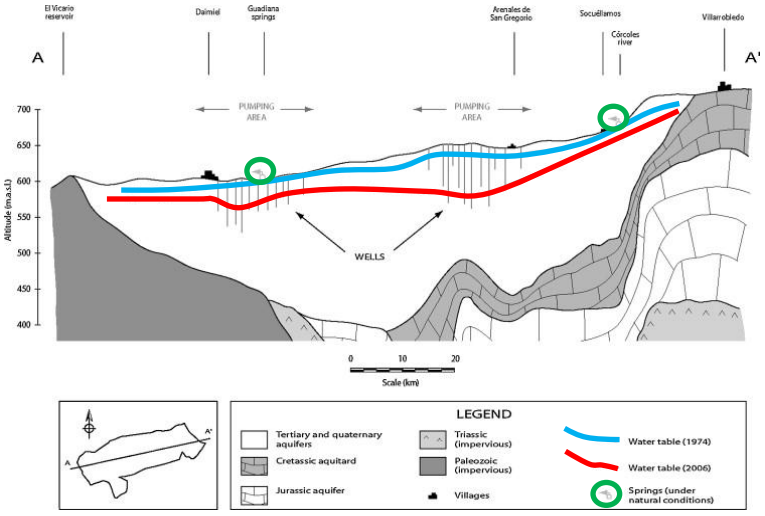
- Economic growth.
- Depletion of groundwater levels affected wetlands ecosystems.
- Campo de Montiel aquifer area, important social conflicts and violent.
- Water quality degradation.
- National and regional Administrative Bodies overwhelmed.

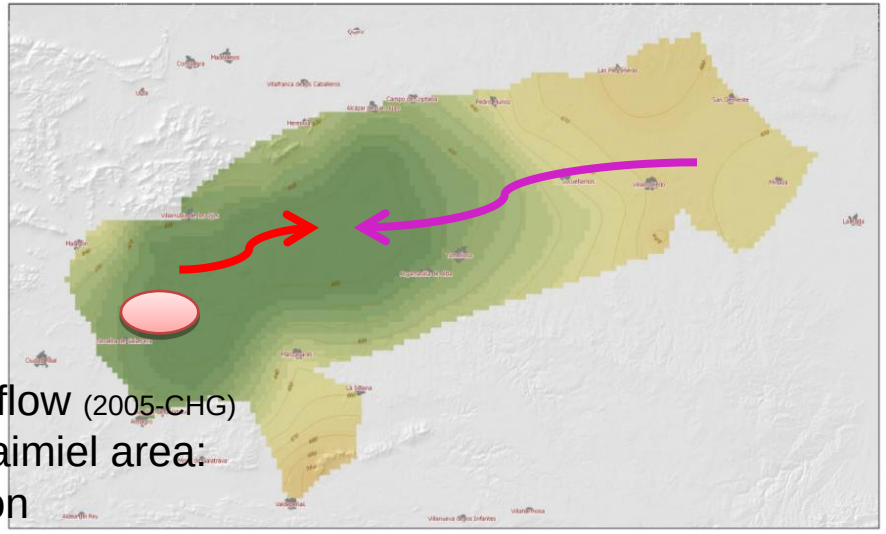
Evolution until end of 80's

Natural pattern groundwater flow (1976-IGME).
Free Discharge Tablas de Daimiel area



Hydrogeological section of Mancha Plain (
P. Martínez-Santos y P.E. Martínez-Alfaro, 2010)





Modify pattern groundwater flow (2005-CHG)
No Discharge Tablas de Daimiel area:
Central depression

Declarations of "Aquifer Overexploitation"

- 1985 Water Law: depleted aquifers to be declared overexploited.
- Mancha Occidental and Campos de Montiel aquifer declared.
- Aquifers declared, managed through Abstraction Plans:
  - annual maximum abstractions.
  - Banned Drilling new wells.
  - Irrigation Farmer Associations Extraction Committees were created.
- Social opposition against restrictions. Farmer Associations demanded compensation.
- Abstraction restrictions were not properly controlled and prohibitions about new drilling of wells were not observed (illegal situations).
- Administrative Bodies lack of human and technical means.

1992 Income Compensation Plan

- First agro-environmental programs of the EU Common Agricultural Policy.
- Objective: reduce abstraction and recovery of wetlands
- Farmers required to use less water, abandon water-intensive crops, reduce fertilizer and pesticide use.
- Compensation to farmers for income losses
- Proposed for five years, investment €96 million, and extended to 10 years (about €180 million).
- Slight Abstractions reduction and water-intensive crops such as maize and beet almost disappeared.

1992 Income Compensation Plan

- Nevertheless early 90's intense drought caused water table depletion.
- In the second half of the 90's groundwater table rose (heavy rainfall strongly contributed).
- The Plan was not definitive: paid for a temporary renounce to water but it did not create a permanent sustainable agriculture or new economic activities.
- Lack of coordination among Administrative Bodies, and a lack of human and technical means to control.
- Decrease in employment and economic activities (although famers incomes increased),
- llegal abstractions on going.

1998 Basin Management Plan (1998 Basin Hydrological Plan)

- The 1998 Hydrological Plan, required by Spanish water law.
- Objective satisfy socio-economic activities water.
- This Plan recognised the situation in the Upper Guadiana, and included
  - Overexploitation declarations .
  - Limited abstraction and banned new rights over groundwater.
  - Proposed increase control on abstractions.
  - Anticipated possible internal and external aquifers recharge.
- Plan studied the Upper Guadiana water deficit, and asked for other solutions to the National Hydrological Plan.

National Hydrological Plan

- National Hydrological Plan coordinates basin Plans, and solves aspects they cannot.
- The National Hydrological Plan 2000 did not consider a water transfer to Upper Guadiana, but restriction and management measures.
- Established to develop a new Upper Guadiana Special Plan, to go further in management measures (restricted abstraction).

Water Framework Directive

- Water Framework Directive main objective to achieve a good status of surface and groundwater bodies in 2015, throughout a participative management planning process.

- WFD defines the good status of groundwater bodies as ***the good quantitative and chemical status and the good status of the surface ecosystems related to groundwater bodies*** (see Mancha Occidental-Tablas de Daimiel and Campos de Montiel-Lagunas de Ruidera).

Upper Guadiana Special Plan

- The 2008 Upper Guadiana Special Plan was required by 2000 National Hydrological Plan:
  - A comprehensive plan.
  - To be a permanent and definitive solution.
  - Endowed with sufficient means.
  - Good coordination required among Administrative Bodies (water, environment, agriculture, and socio-economic development).
  - Wide public participation (**The Plan was adopted with a broad consensus**).
- Its main objectives were:
  - Achieve a good status of water bodies.
  - To overcome existing structural water deficit.

Upper Guadiana Special Plan

- The measures of UGSP were:
  - Transformation of private water rights (ancient law) into licenses (new law).
  - Agreements for transfer of water rights (reallocation).
  - Purchase of water rights (70% to the recovery of water bodies, 30% to allocate water rights to farmers).
  - Program of management and control measures.
  - Environmental Program.
  - Aid Program for Farmers Associations and environmental education.
- The total budget was 3,000 M€, to be financed by the Central Government (with no European Funds).

Upper Guadiana Special Plan

- Other complementary Programs (different financing):
  - Urban water supply, drainage and waste treatment Program.
  - Agricultural Development Program (to less water consuming crops).
  - Socio-economic development Program (to promote new sectors).
- The implementation of UGSP was very limited (crisis):
  - Transformation of private water rights.
  - Purchase of water rights (14 hm^3), devoted totally to vineyard farms.
  - Installation of water-metering devices.
  - Aid agreement with Farmer Associations, education measures.
  - Socio-economic and Agricultural Programs were not carried out at all.

Upper Guadiana Special Plan

- UGSP implementation was severely criticized:
  - Groups of economic interest considered unfulfilled investments.
  - Environmental groups considered its implementation partial and opaque.
  - Environmental and socio-economic Program were not carried out.
  - UGSP too ambitious and unrealistic for a context of crisis.
  - People call for reforms (focus on management and restriction measures, with no cost).
- A struggle between the two most important political parties in the region.

Guadiana District Management Plan 2009-2015

- The Guadiana District Management Plan objectives:
  - To satisfy socio-economic water resources demands (traditional Spanish planning objective)
  - To achieve the good status of the water bodies (new WFD objectives).
- The Plan submitted to public consultation included the UGSP, as a basic measure to achieve these goals.
- During the public consultation process:
  - UGSP was severely criticized and a deep review requested.
  - It was asked for consider water transfer from other basins.

Guadiana District Management Plan 2009-2015

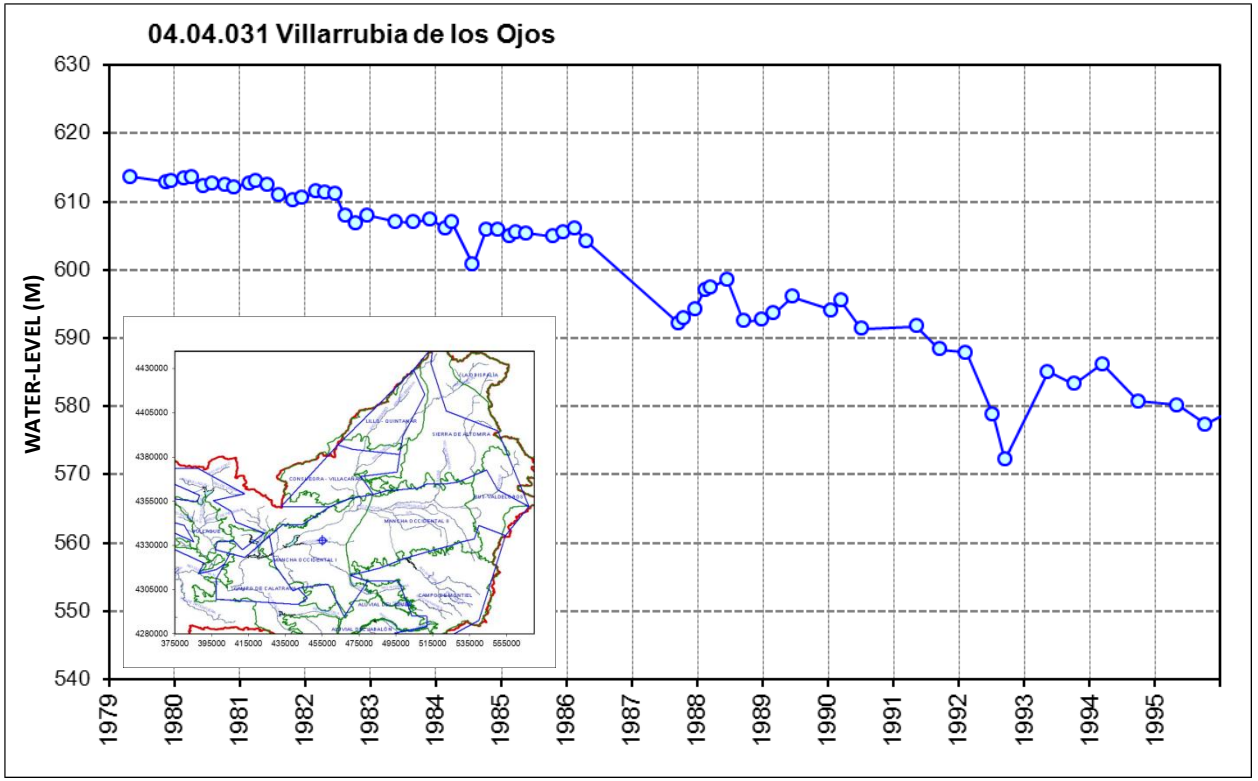
- As a result Guadiana District Management Plan:
  - the review of the UGSP and
  - suggests to the National Hydrological Plan a possible transfer.
- The new District Plan includes a set of hydrological management measures with no cost:
  - Transformation of private water rights into public licenses.
  - Water right-exchange system (private contracts).
  - New risk situation declaration of not achieving objectives of good status to all groundwater bodies (Upper Guadiana).
  - Centre for the Exchange of Water Rights.

Guadiana District Management Plan 2009-2015

- This Management Plan meant a major scientific and technical knowledge advance.
- A hydro-geological model of all Upper Guadiana groundwater bodies implemented, which:
  - let define available water resources in each groundwater body,
  - a tool for the decision making (ordinary management)
  - according to model results, with restriction measures, achieve a good quantitative status in the period 2015-2021.

Quantitative status evolution since the declaration of overexploitation

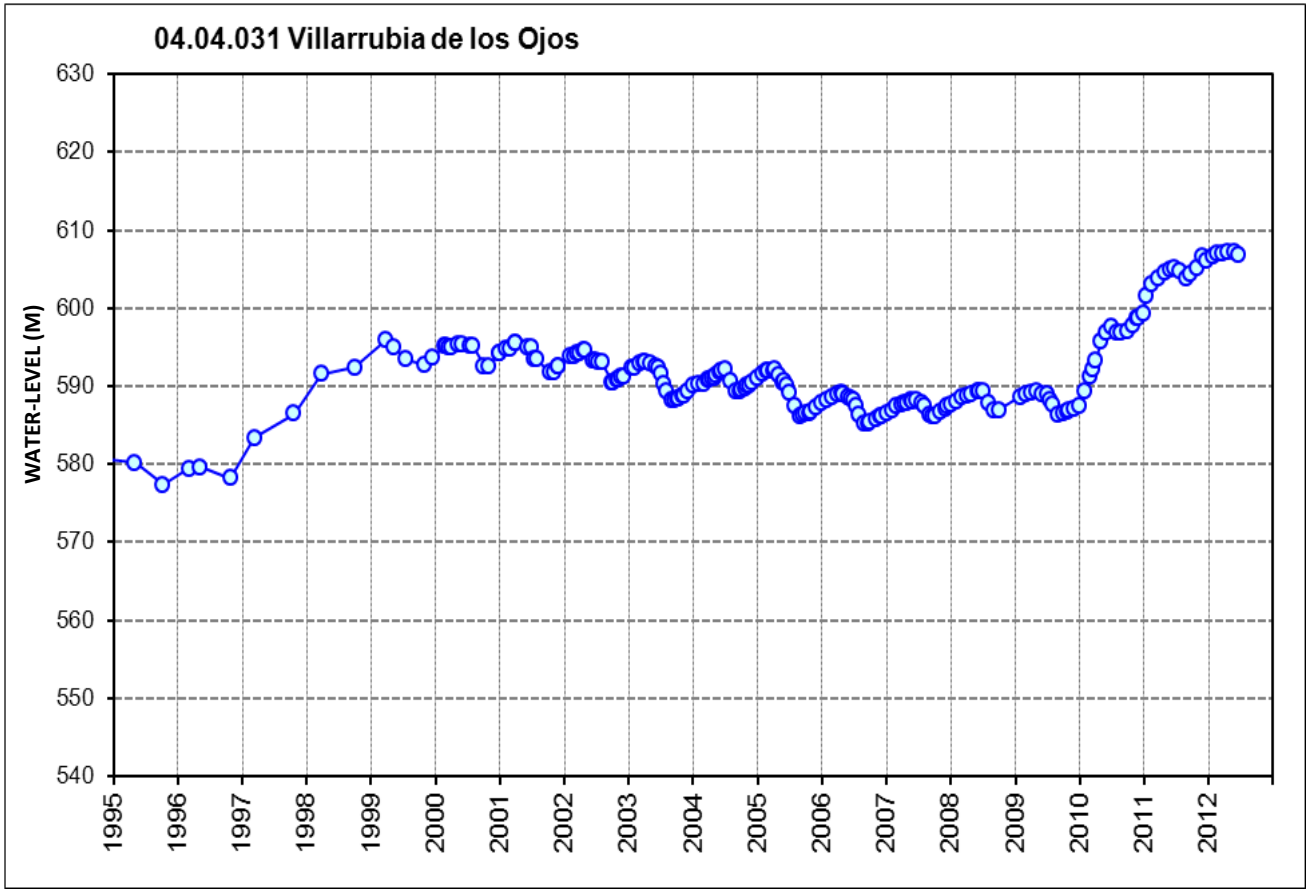
- There are two main periods of groundwater depletion, followed by two partial recovery periods.
  - ❑ 1979-1993 period, level declined significantly (falling further during the 1990-1995 drought). Total drawdown was 42 m by the mid 1990s. Severe environmental damage.



Quantitative status evolution since the declaration of overexploitation

- Wet 1996-1999 period, a 20 m recovery.
- 1999-2009 second decline interval, less intense. The effectiveness of management measures clear, especially 2006-2009 period.
- 2009 to 2012 wet period, a new and important water table rising (21 m).

Huge recovery, faster and larger than previous recovery.



Conclusions

- Cycles of groundwater level fluctuation and environmental problems,
- Swing of successive regulations and action plans,

Continuous conflict in the area.

- Regulations restricting water abstraction and the penalties, on the one hand,
- Water savings incentives and the support measures on the other,

Water consumption & slight shift to water-effective crops.

Conclusions

- Although the quantitative status of water bodies has improved
  - governance problems persist
  - ongoing social conflict,
  - social participation is limited,
  - economic growth is doubtful, and
  - general environmental status is not good.
- A definitive solution seems far. New plans will continue.

THAN YOU VERY MUCH FOR YOUR ATTENTION