

INTEGRATED URBAN WATER RECLAMATION AND REUSE SYSTEM

Miguel Ángel Ródenas Cañada, President of the Segura RBA (Spain)

IWRM TOOLS IN THE MEDITERRANEAN: Non conventional water resources

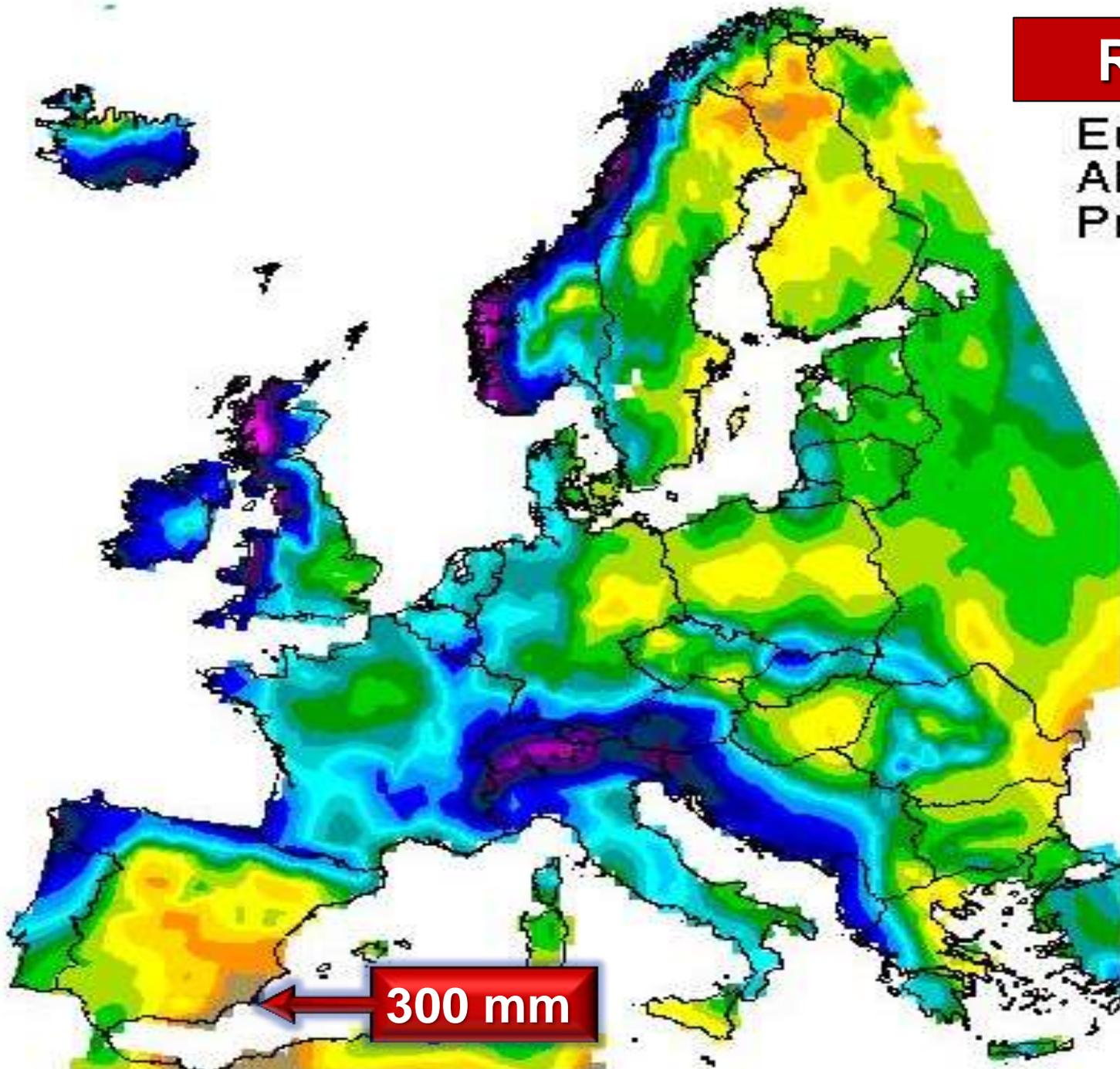


Valencia. Spain
20 de Septiembre 2012



RAINFALL

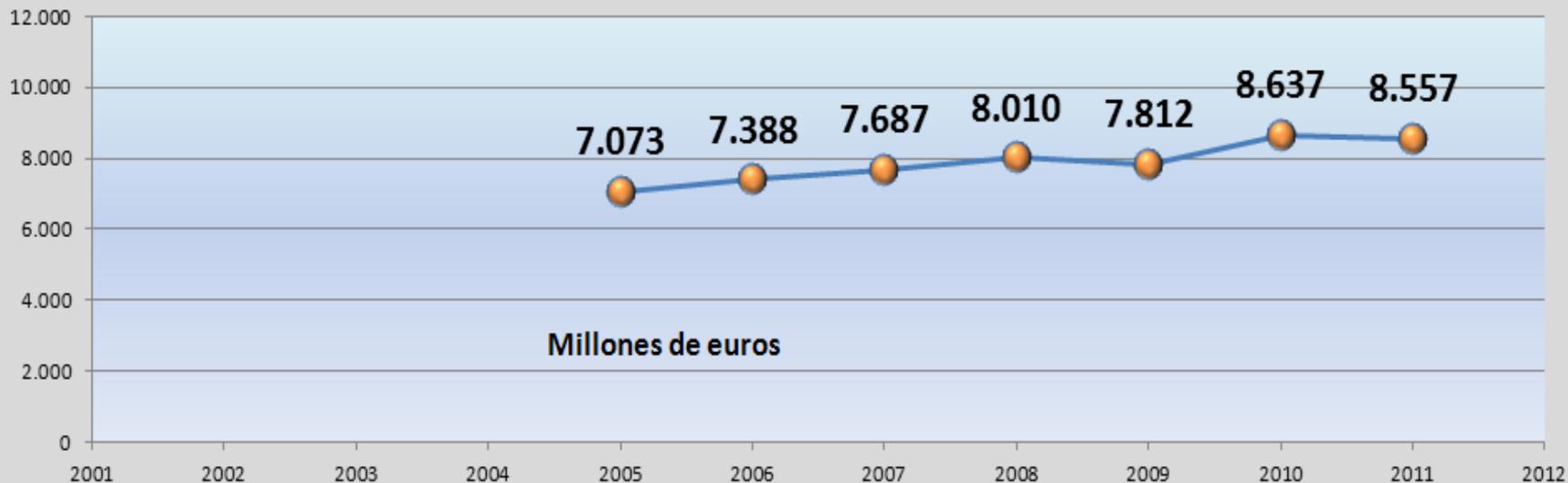
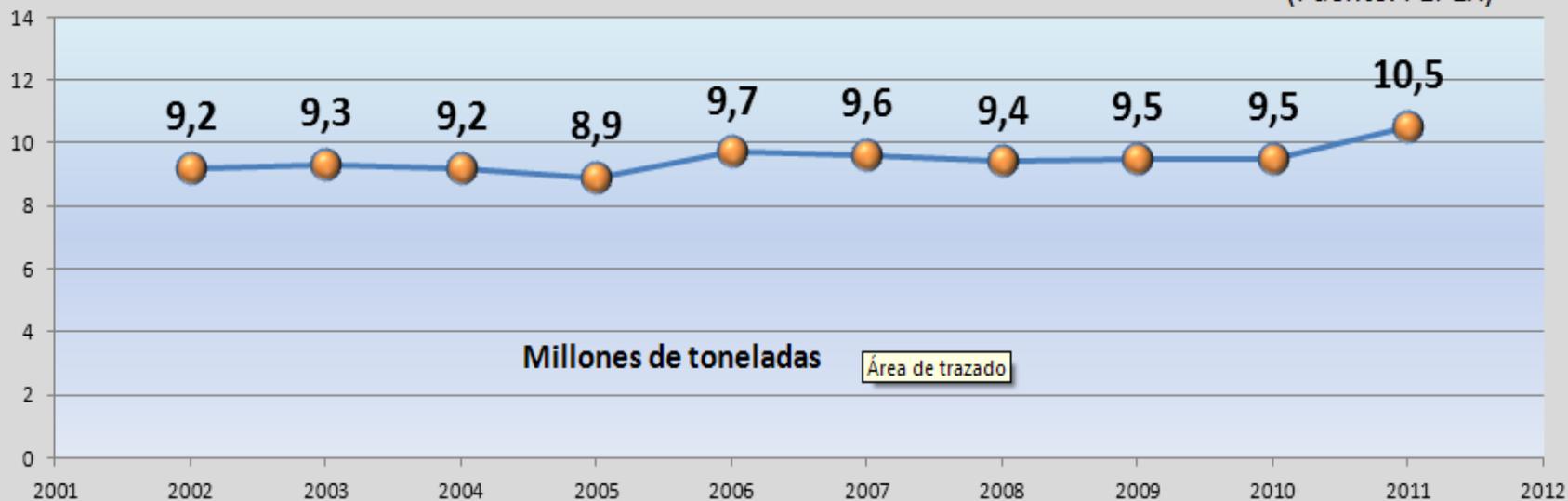
Europe -
ANNUAL
Precipitation





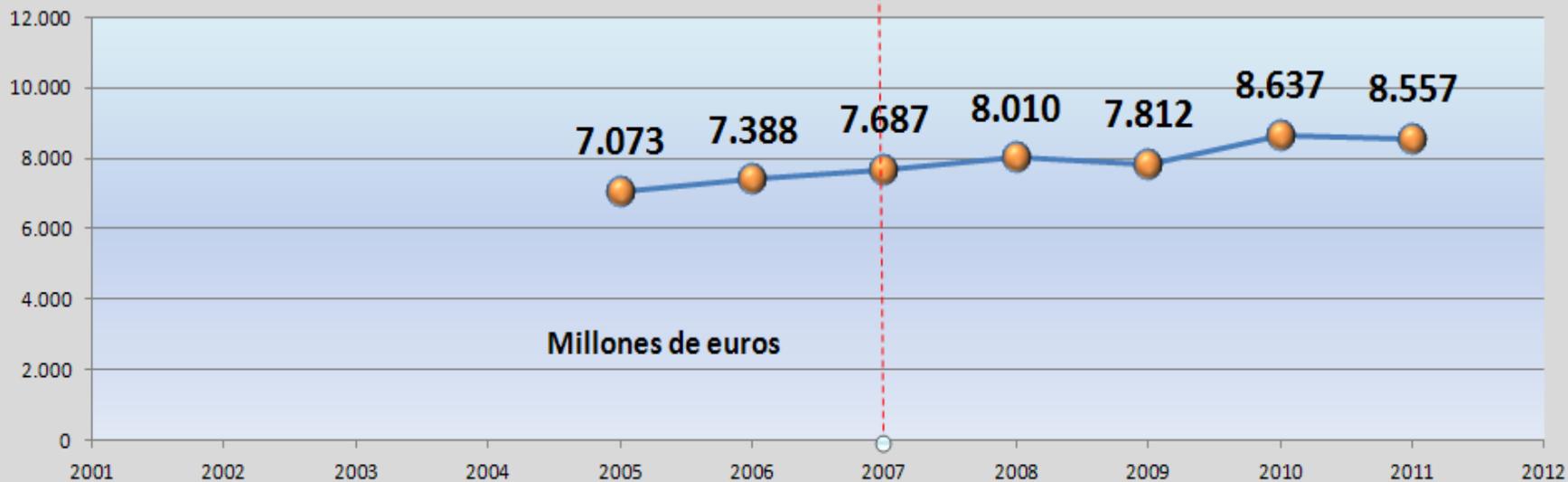
Exportaciones de Frutas y Hortalizas - España

(Fuente: FEPEX)



Exportaciones de Frutas y Hortalizas - España

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A map of Europe where the countries of the European Union are highlighted in a solid blue color. The rest of the European continent and surrounding regions are shown in a light gray color. The text "UE: 500 million people" is overlaid in yellow on the blue area.

UE: 500 million people

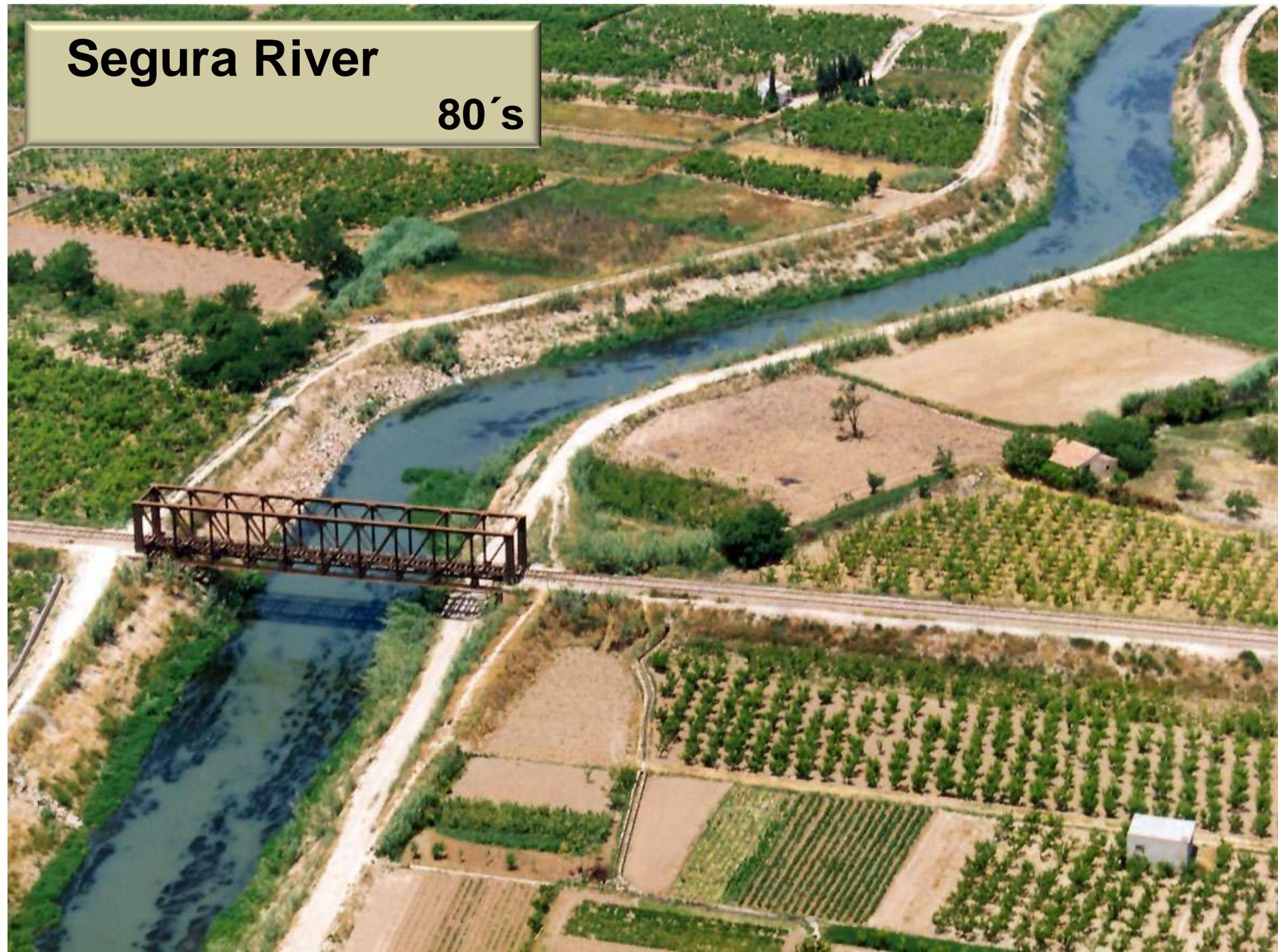
Segura River

Contraparada control station



Segura River

80's



MURCIA CITY



Segura River

**MASTER PLAN
FOR URBAN
WASTEWATER RECLAMATION
2001-2010**

OBJECTIVES

MORE WATER (FOR AGRICULTURAL USE)

RECOVERY SEGURA RIVER (AND NATURE)

ENSURING WASTEWATER TREATMENT

(EU DIRECTIVE 91/271/CEE)

BASIC POLICIES

BUILDING INFRASTRUCTURES

WASTEWATER MANAGEMENT SYSTEM

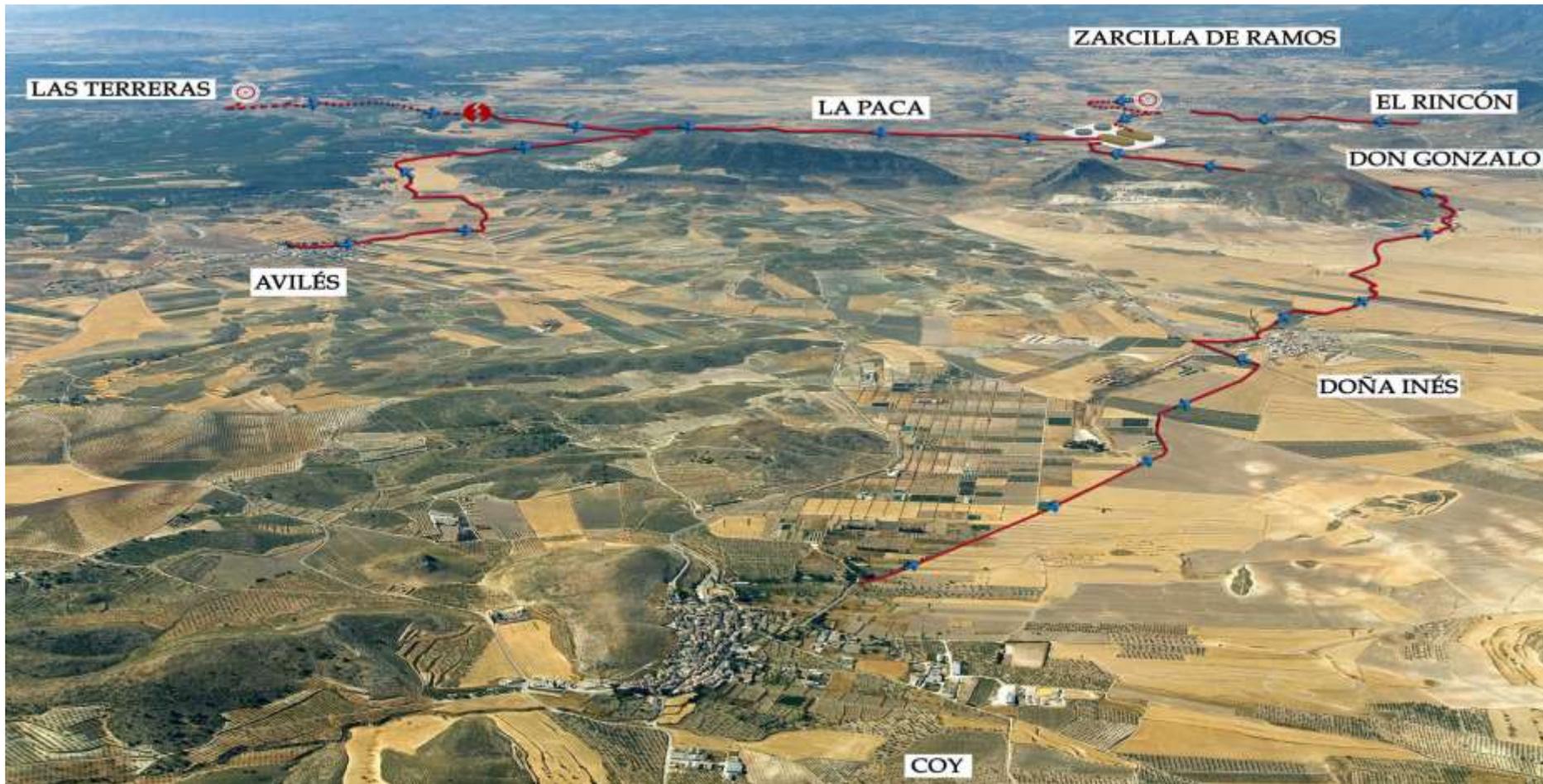
INDUSTRIAL WASTEWATER

- **SEWER DISCHARGES CONTROL**
- **AT SOURCE TREATMENT**

MASTER PLAN FOR URBAN WASTEWATER RECLAMATION 2001-2010 INFRASTRUCTURE

‘WHOLE’ COLLECTING SYSTEMS :

99% URBAN POPULATION CONNECTED TO TREATMENT



MASTER PLAN FOR URBAN WASTEWATER RECLAMATION 2001-2010

DESIGN CRITERIA FOR WW TREATMENT PLANTS



Title 22 STATE CALIFORNIA WATER CODE
Total coliform < 2.2 ufc/100 mL
Turbidity < 2 NTU

TERTIARY TREATMENT

MASTER PLAN FOR URBAN WASTEWATER RECLAMATION 2001-2010

WASTEWATER TREATMENT PLANTS



46 LARGE WASTEWATER TREATMENT PLANTS

Treatment capacity: 525.000 m³/d

Population capacity : 5 million

70 % Tertiary treatment capacity

51 SMALL WASTEWATER TREATMENT PLANTS

645 MILLION EUROS

- **AGRICULTURE AND WATER REGIONAL DEPARTMENT**
- **MINISTRY OF AGRICULTURE, FOOD AND ENVIRONMENT (Segura River Basin Authority)**
- **CITY COUNCILS**



**CO-FINANCED PROJECT BY EUROPEAN UNION
COHESION FUND / ERDF**

MASTER PLAN FOR URBAN WASTEWATER RECLAMATION 2001-2010
WASTEWATER MANAGEMENT SYSTEM

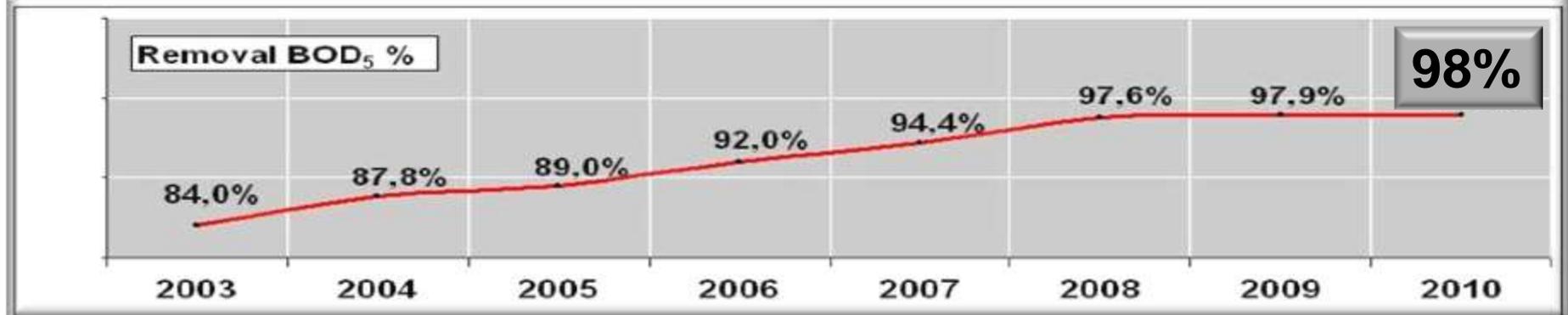
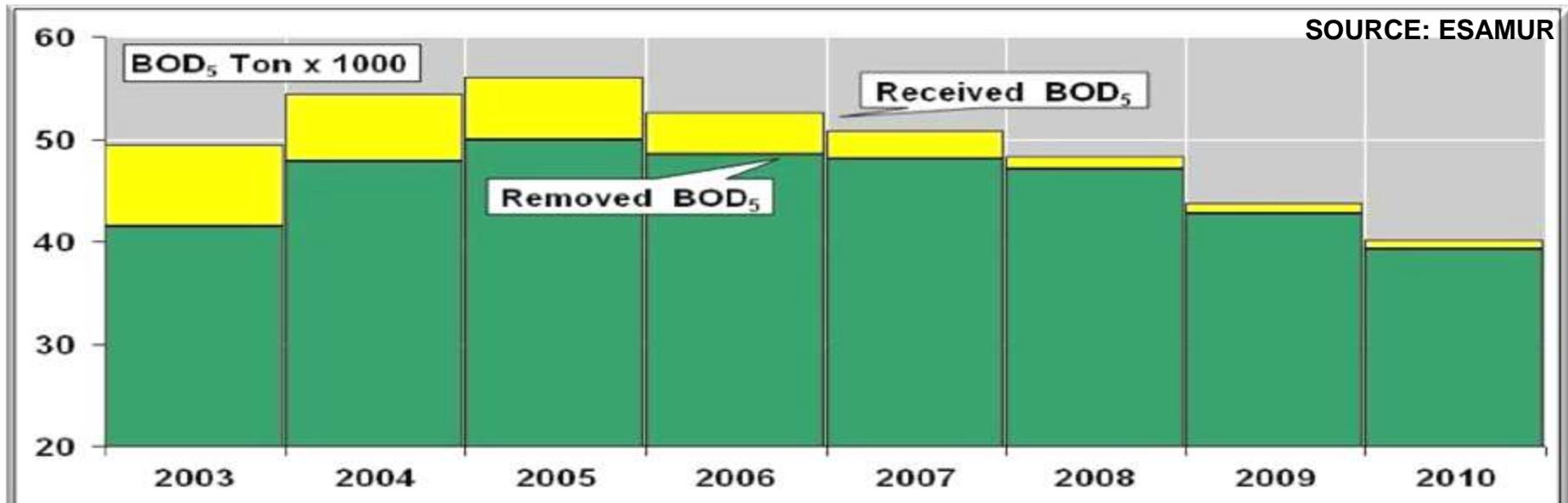
WASTEWATER RECLAMATION LEVY

'You contaminate, you pay'

REGIONAL AGENCY 'ESAMUR'

RESULTS

OVERALL CONTAMINATION LOAD IN TREATMENT PLANTS



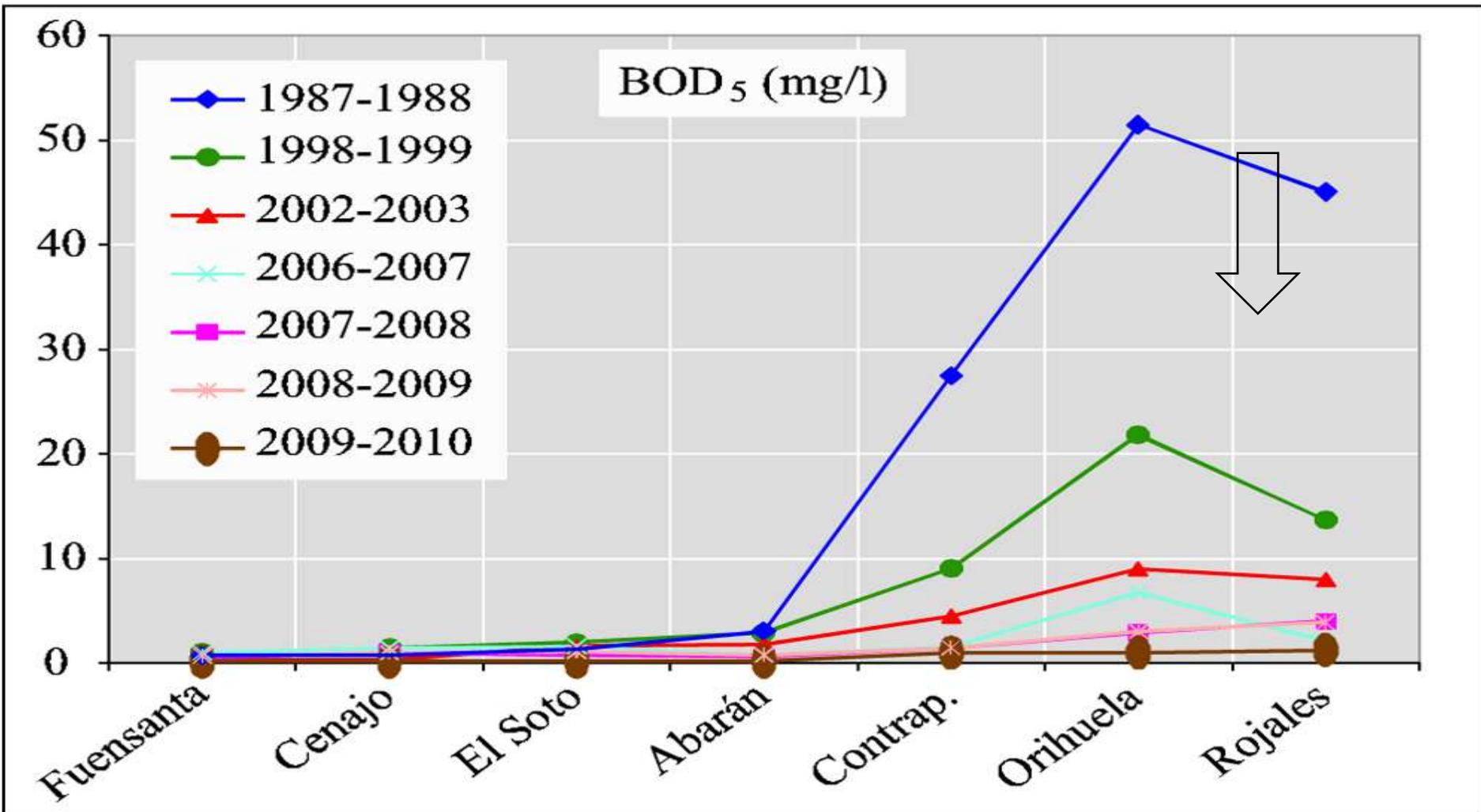
INTEGRATED URBAN WATER RECLAMATION AND REUSE SYSTEM 2010



TRATED WASTEWATER	111 Million m³
REUSED WATER (Directly o indirectly)	100 Million m³
REUSED / TRATED	90%

SEGURA RIVER WATER QUALITY ALONG THE LONGITUDINAL PROFILE

Source: Segura River Basin Authority





A fishing day in Murcia City











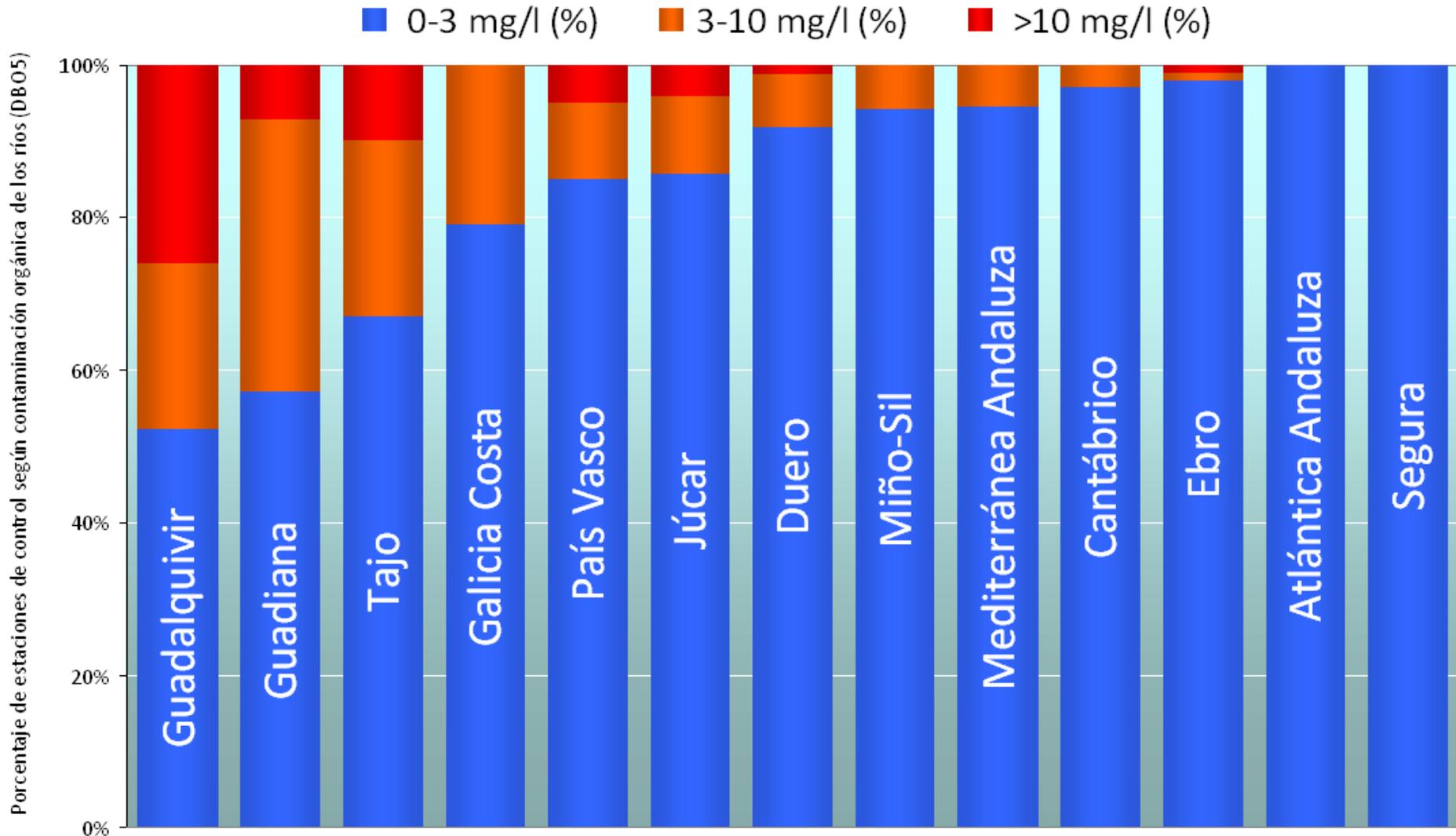
Another option, ...navigate





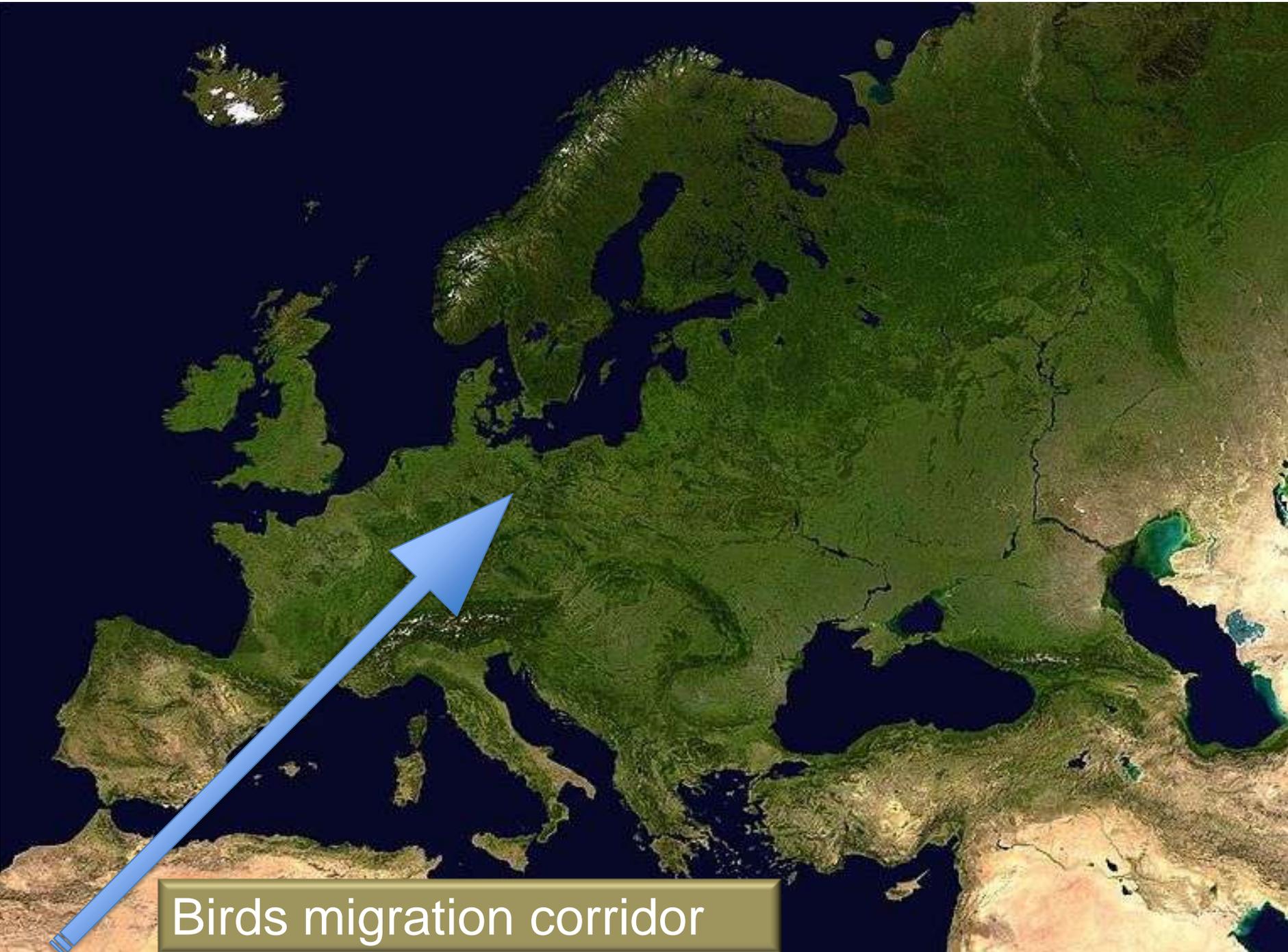
And the old bridge sees amazed how they enjoy in the river.....

SURFACE WATER QUALITY BY SPANISH RIVER BASINS



Source: Ministry of Environmental, Rural and Marine

WETLANDS RECOVERY

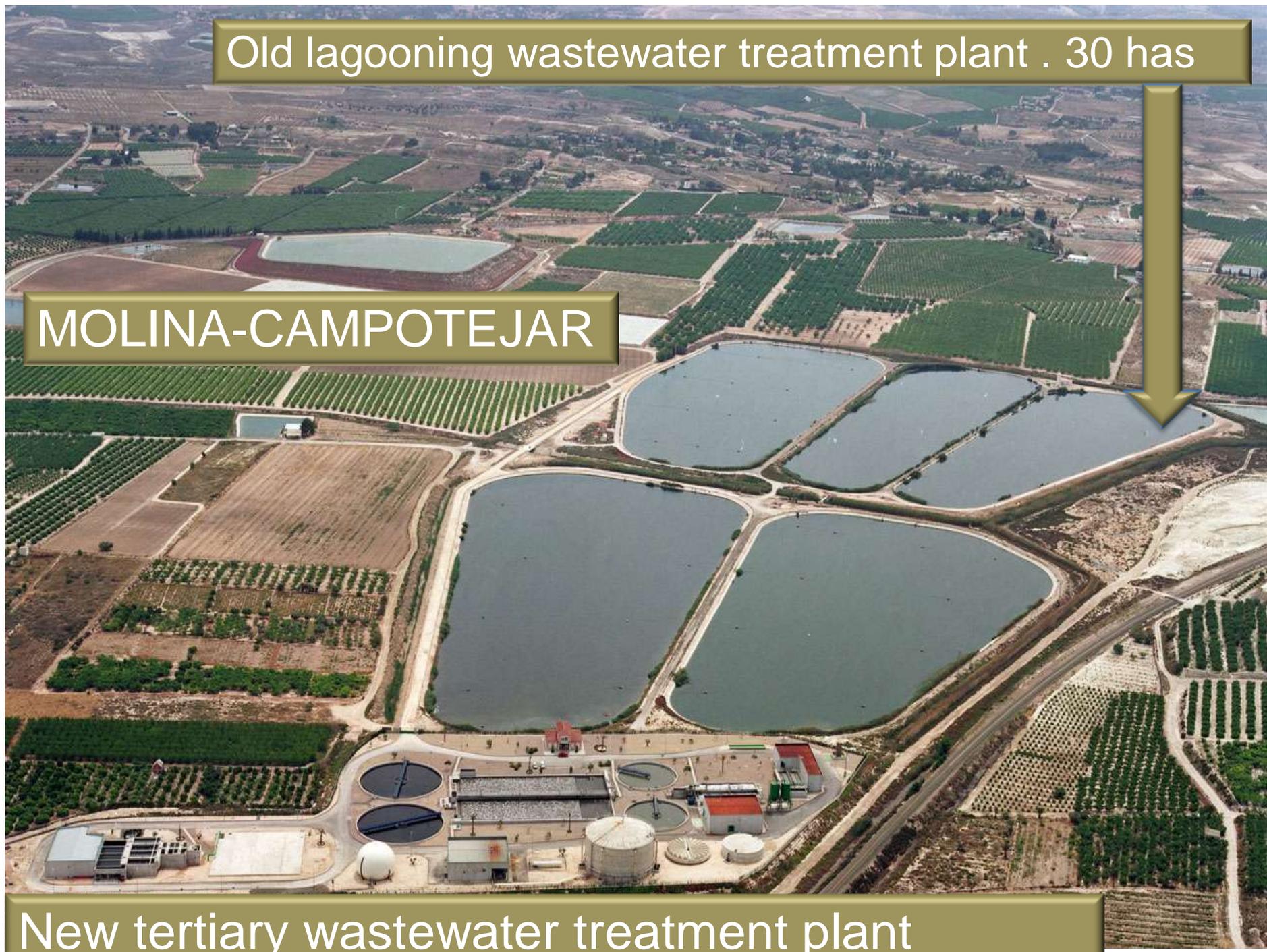


Birds migration corridor

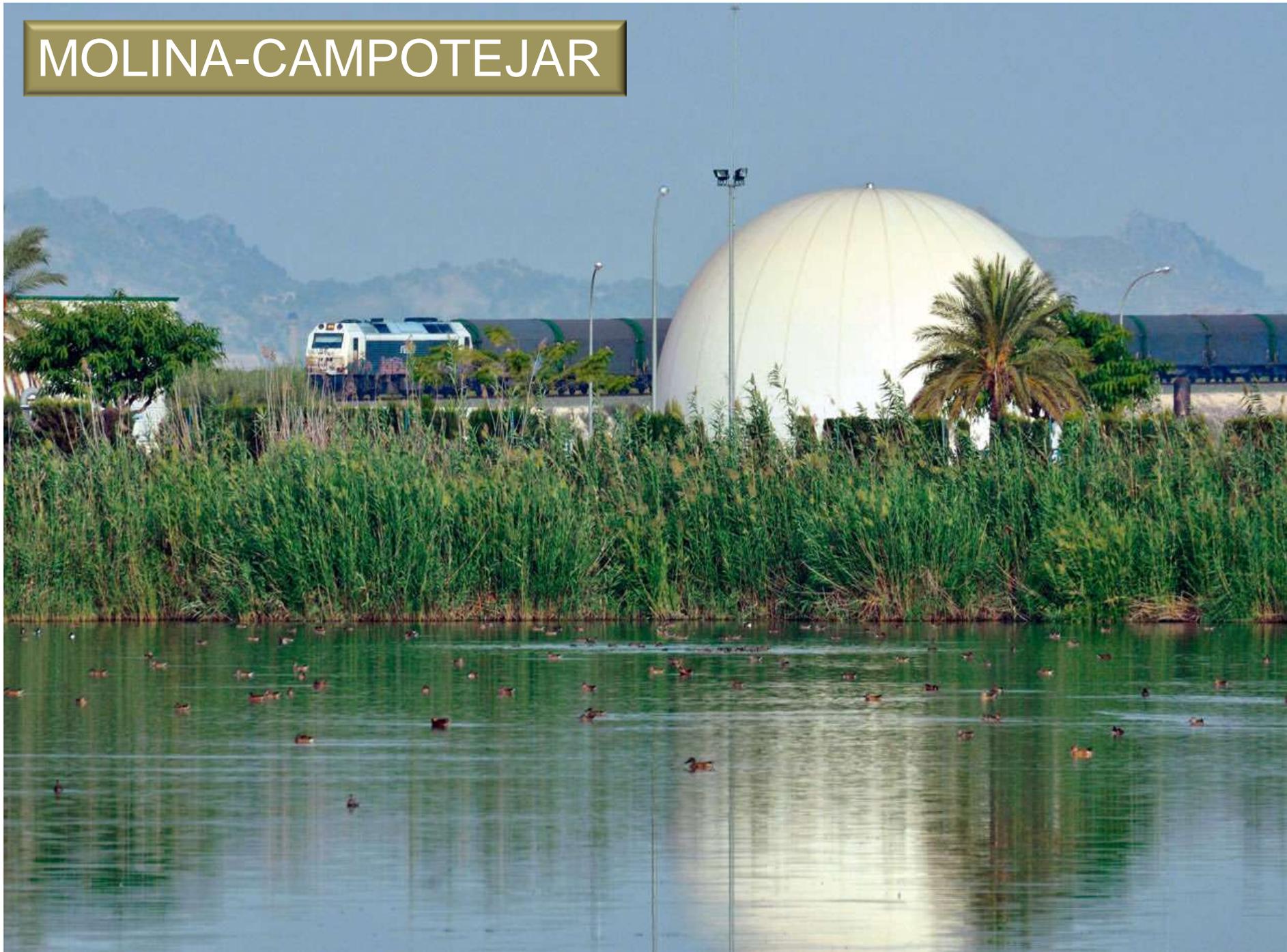
Old lagooning wastewater treatment plant . 30 has

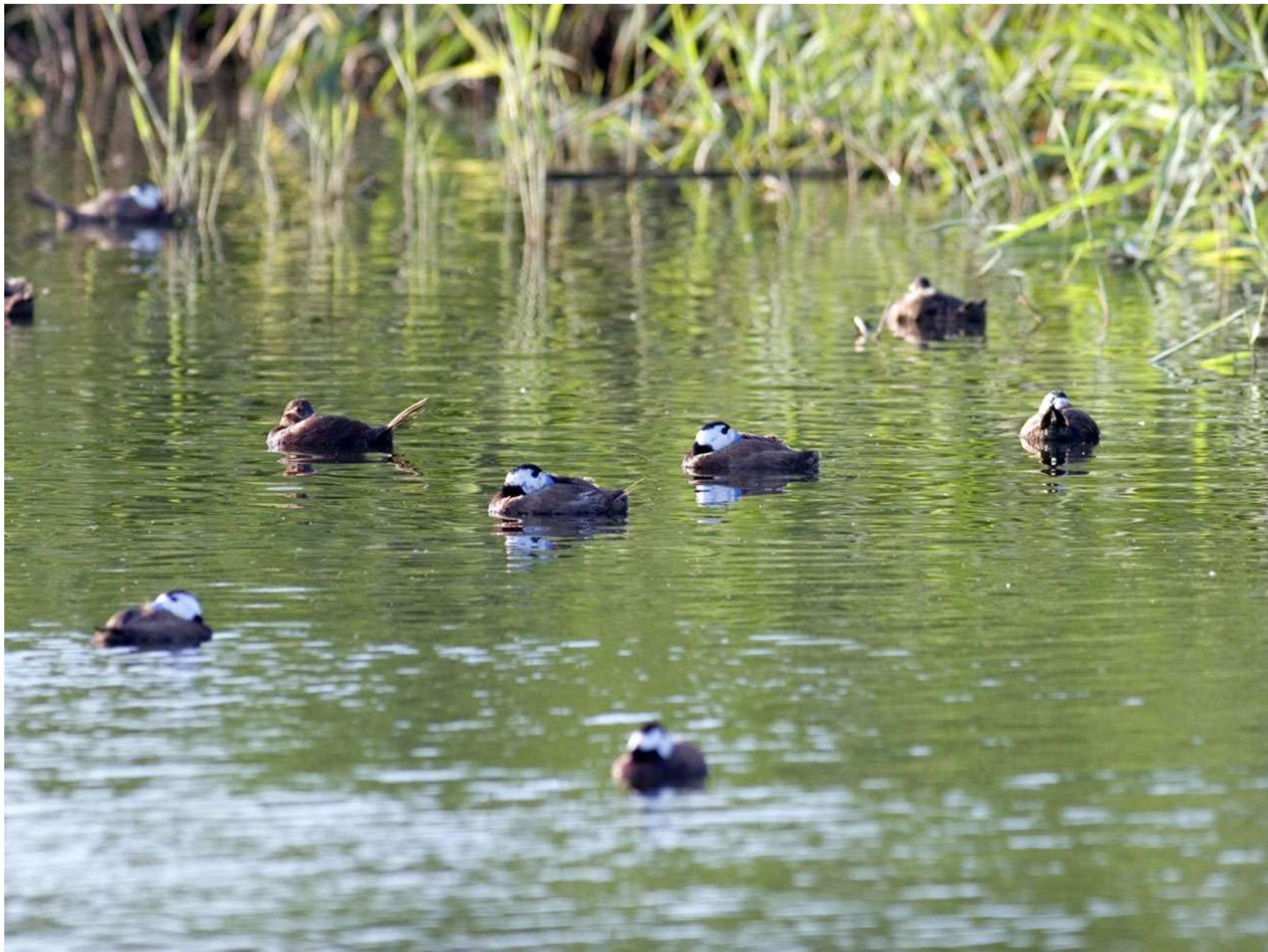
MOLINA-CAMPOTEJAR

New tertiary wastewater treatment plant



MOLINA-CAMPOTEJAR





**Two wetlands in the Region of Murcia with reclaimed wastewater have been included in the RAMSAR CONVENTION LIST OF WETLANDS OF INTERNATIONAL IMPORTANCE
(January 4th, 2011)**

ACHIEVED OBJECTIVES

- **MORE WATER : 100 Million m³**
- **SEGURA RIVER RECOVERY**
- **WETLANDS RECOVERY (TWO 'RAMSAR LIST')**
- **EU WASTEWATER TREATMENT DIRECTIVE (100% Agreed)**

The 'General System for Wastewater Reclamation and Reuse. Region of Murcia' has been awarded

'Acueducto de Segovia Prize in Civil Works and Environmental Projects'

Fifth Edition, 2011

Spanish Society of Civil Engineers



water21

August 2012

Magazine of the International Water Association

Reuse solution for the Valley of Mexico

Progress on the path to resilient cities

Reuse brings Spain's Segura River back to life

OFFICIAL PUBLICATION
IWA World Water
Congress and
Exhibition

WATER REUSE

Wastewater reuse brings life back to Spain's Segura river

Spain's east Segura suffered from severe degradation from agricultural fertilizers, pesticides and sewage treatment plant effluent. A program of wastewater reuse and desalination has brought the river back to life, allowing the river to recover and benefit 150,000 people in the region.

The Segura is a 150 km long river in the south-east of Spain. It is one of the most degraded rivers in the country. The river has been severely polluted by agricultural fertilizers, pesticides and sewage treatment plant effluent. The river is now almost completely dry for much of the year.

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WATER REUSE



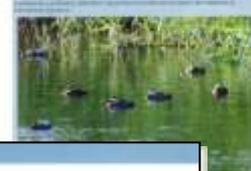
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WATER REUSE

Water reuse solutions for urban and rural communities

Water reuse solutions for urban and rural communities. This article discusses the challenges of water reuse in different settings and the benefits of various technologies.



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Participate in the Spanish Society of Civil Engineers

THANKS FOR YOUR ATTENTION

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President of the Segura River Basin Authority

