



*CETaqua- Laurent Pouget, Suzy Mc Ennis*

**Medium and long term  
water resources modelling as a tool  
for planning and Global Change adaptation.  
Application to the Llobregat basin.**

**E-seminar, Water Change, October 4<sup>th</sup> 2012**

**LIFE07 ENV/E/000845**

# CETaqua, Water Technology Center

Private foundation created for the purpose of developing R+D+i projects



We direct our research towards four main areas of activity:



The success of CETaqua is based on collaborative research joining the efforts of private and public partners, as well as, academia.



70+ projects

6 research lines

CETaqua: experts in construction, coordination and execution of R&D projects





# CETaqua, Water Technology Center

**1**

**Alternative  
Resources**

**2**

**Impact of  
the global  
change**

**3**

**Efficient  
infrastructures  
management**

**4**

**Environment  
and Health**

**5**

**Energy and  
Water**

**6**

**Management  
of the water  
demand**

## L2: Impacts of Global change

### Mitigation




- Life Cycle Analysis
- Carbon Footprint

### Adaptation

- Water Resources Management
- Risk management (Hydroclimatic Extremes)
- Global change scenarios

# CONTENT

## Introduction

-  Context and issues at stake
-  Innovation and key results
-  Conclusions

# Introduction

■ **Objective:** Develop a methodology and a tool to study **Global Change impacts** on water resources and propose **adaptation measures**

■ **Funding:** LIFE+ (total project 1,2 M€)

■ **Duration:** 3 years 2009 - 2012

■ **Participants:**



Partners:



Collaborators:



Project advisors:

Prof. E. Custodio

L. López

■ **Stakeholders involved:**

- 7 Spanish River Basin Agencies
- Spanish Office of Climate Change
- Private companies (Agbar, Iberdrola)
- Other regional institutions

# CONTENT

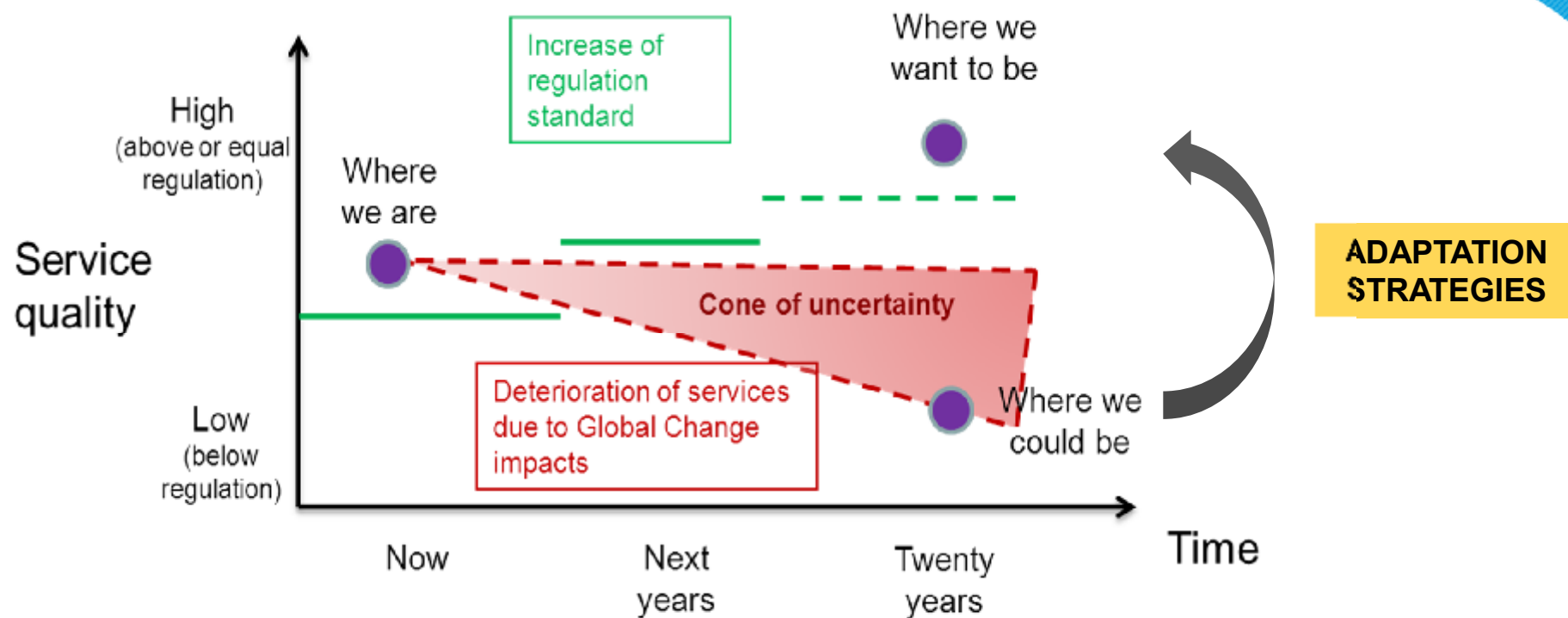
■ Introduction

■ **Context and issues at stake**

■ Innovation and key results

■ Conclusions

# Context and issues at stake





# Context and issues at stake

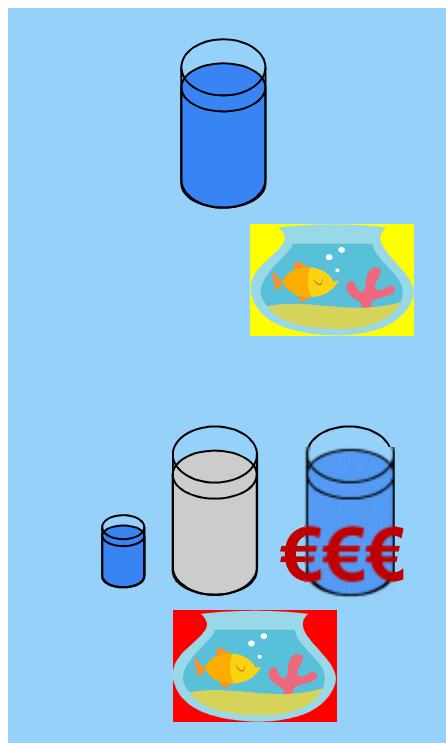




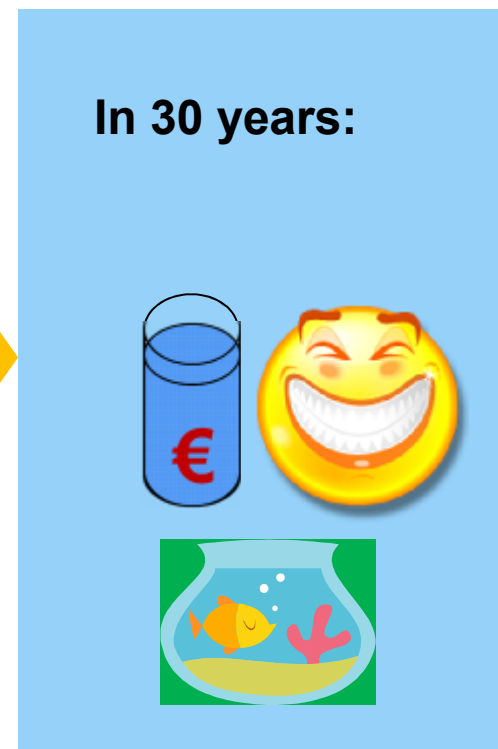
# Context and issues at stake



**Creation of coherent  
Global Change  
scenarios**



**Modelling possible  
impacts (business  
as usual)**

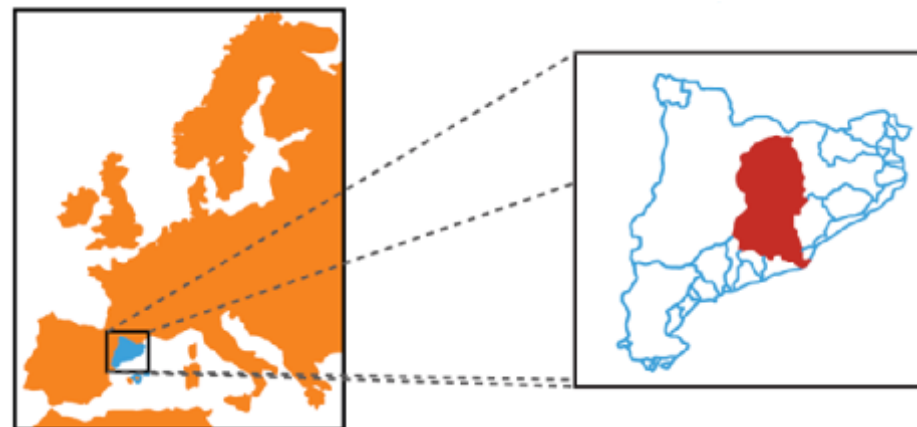


**Determination of  
best measures  
(costs and benefits  
environmental,  
social and  
economic)**

# Context and issues at stake

## ■ Project structure:

- Develop the methodology and a tool
- Apply them to a case study: Llobregat River Basin



# CONTENT

■ Introduction

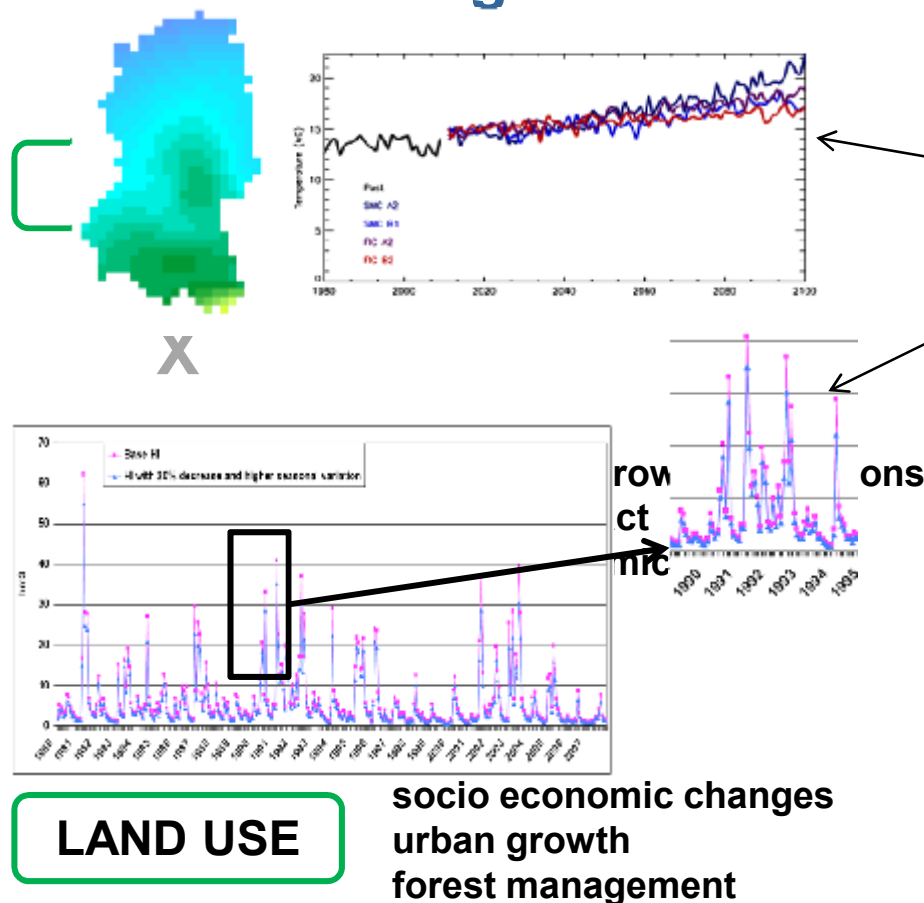
■ Context and issues at stake

■ **Innovation and key results**

■ Conclusions

# Innovation and key results

## Global Change Scenarios



✓ Different methods used for scenario creation:

- Scientific projection models
- Expert hypothesis

✓ Adapted simple methods

- Tailored to the issue and resources
- Full range of possible futures
- Adapted to the models
- Combined in a coherent way

✓ Many scenarios → global vision

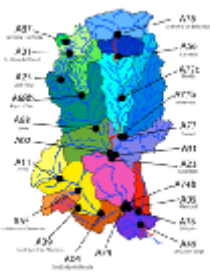


# Innovation and key results

## Modelling of impacts

### Separate parts of the water cycle

#### Hydrological model



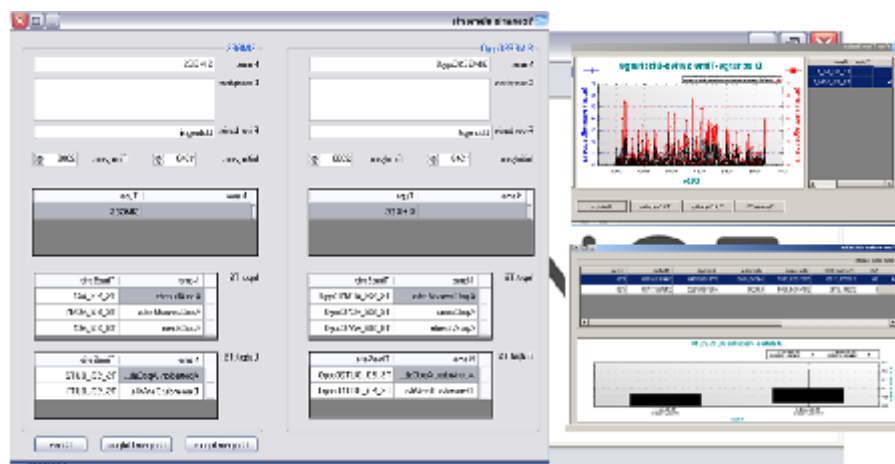
#### Management model



#### Quality model



WCMS



## Water Change Modelling System

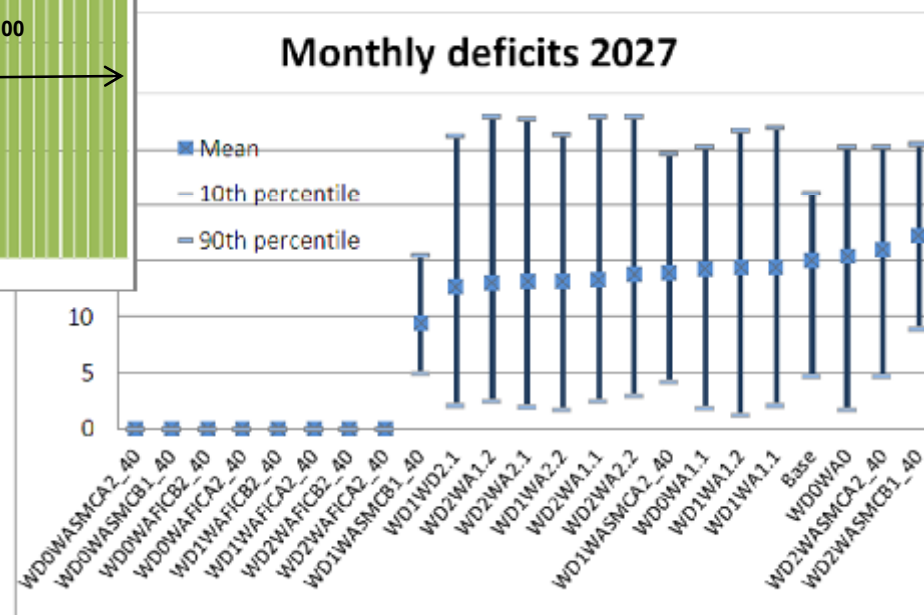
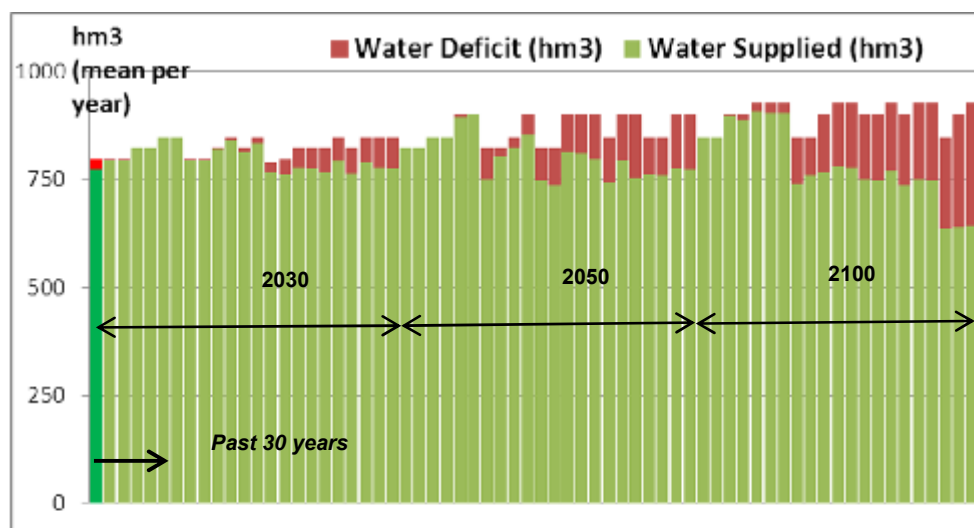
- ✓ Links models of the water cycle
- ✓ Analysis of interconnected processes of water system
- ✓ Adapted to users calibrated models
- ✓ Scenario data management
- ✓ Visualisation of impacts

# Innovation and key results



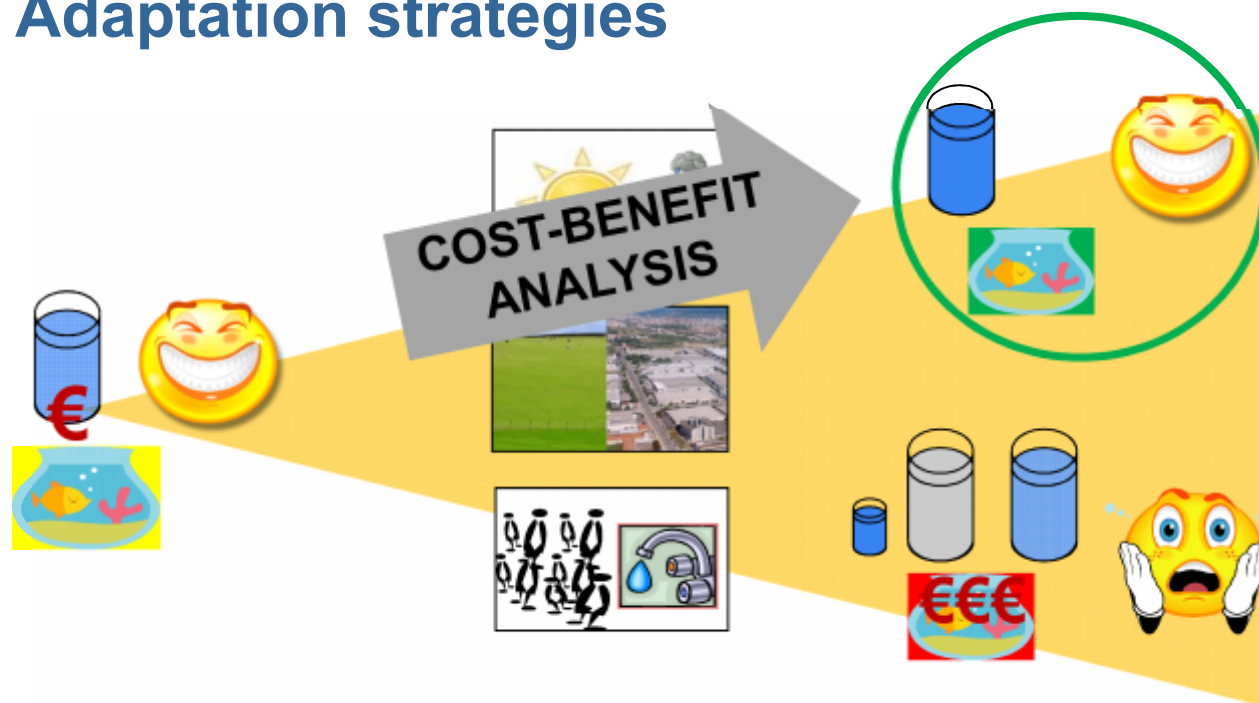
## Modelling of impacts

### Ensemble of results



# Innovation and key results

## Adaptation strategies



1. Is it really necessary to adapt? (Benefits env., soc, eco, > cost of adaptation measures?)
2. Which adaptation strategy is the most efficient?

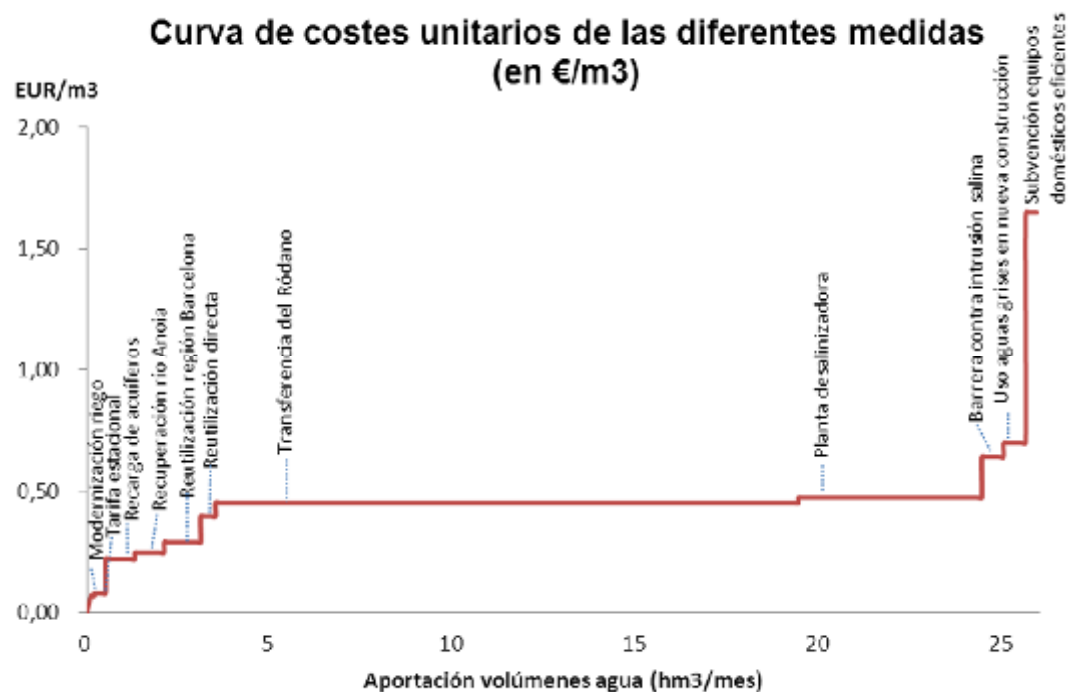




# Innovation and key results

## Adaptation strategies

### Cost of adaptation measure



Desalination plant  
Transfer from Rhone  
Aquifer restoration  
...

From this result, we could know the cost of avoiding water deficit

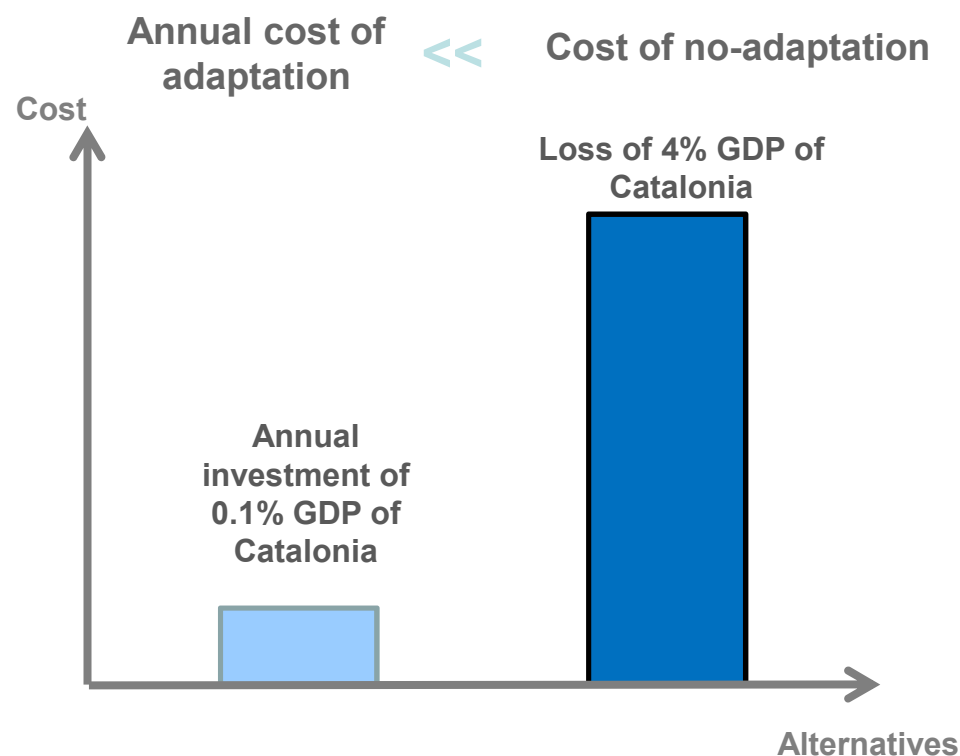
# Innovation and key results

## ■ Adaptation strategies

- Determination of 3 possible strategy to cope with future conditions

## ■ Analysis of results

- Potential benefits of adaptation > costs of adapting?
- Best adaptation strategy



# CONTENT

- Introduction
- Context and issues at stake
- Innovation and key results

## ■ Conclusions

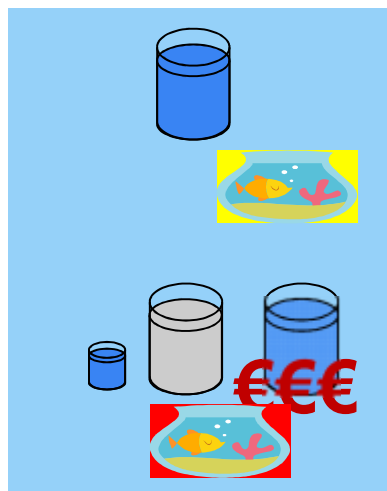
# Conclusion



**Creation of coherent  
Global Change  
scenarios**



**Methodology  
and  
guidelines**



**Modelling possible  
impacts (business  
as usual)**



**Methodology  
and Tool  
linking  
models  
(WCMS)**



**Determination of  
best measures**



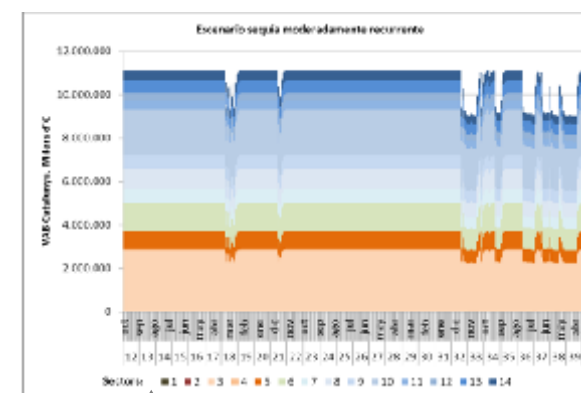
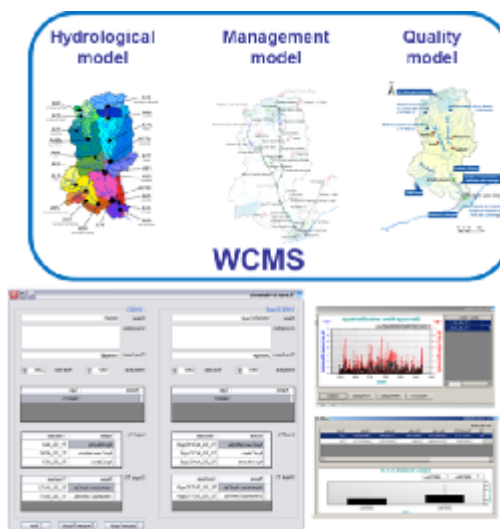
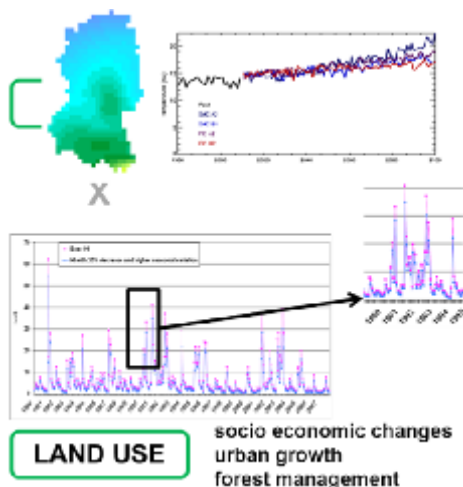
**CBA  
methodology  
linked to models  
results**



# Water Change

**Objective:** Develop a methodology and a tool to study Global Change impacts on water resources and propose adaptation measures

**Solutions given:**



**Creation of coherent Global Change scenarios**

Methodology and guidelines

**Modelling possible impacts (business as usual)**

Methodology and Tool linking models (WCMS)

**Determination of best measures (economic, technical)**

CBA methodology linked to models results

# Want more information?

- Layman report
- Paper published in *Science of the Total Environment*
- Video: <http://youtu.be/RY5qTnQh61M>
- Website: [www.life-waterchange.eu](http://www.life-waterchange.eu)
- IWA Project Innovation Award winner:  
<http://www.iwa-pia.org/>
- Contact us!  
[lpouget@cetaqua.com](mailto:lpouget@cetaqua.com)  
[smcennis@cetaqua.com](mailto:smcennis@cetaqua.com)



**Thank you for  
your attention!**



**[www.life-waterchange.eu](http://www.life-waterchange.eu)**

**Thanks to the LIFE+ Financial instrument of the European Community**

