

How to integrate the sustainable development concept into water management?

Experiences of a water operator

Àngels Cabello
CETAQUA

The Agbar group

Main players in Sustainable Development



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What can we do to be ready?

New challenges

- Increase in extreme precipitation that may cause flooding in urban areas
- Intensification of drought that could origin deficit in water supply or quality problems
- Etc.

Adaptation framework in AGBAR



Goals

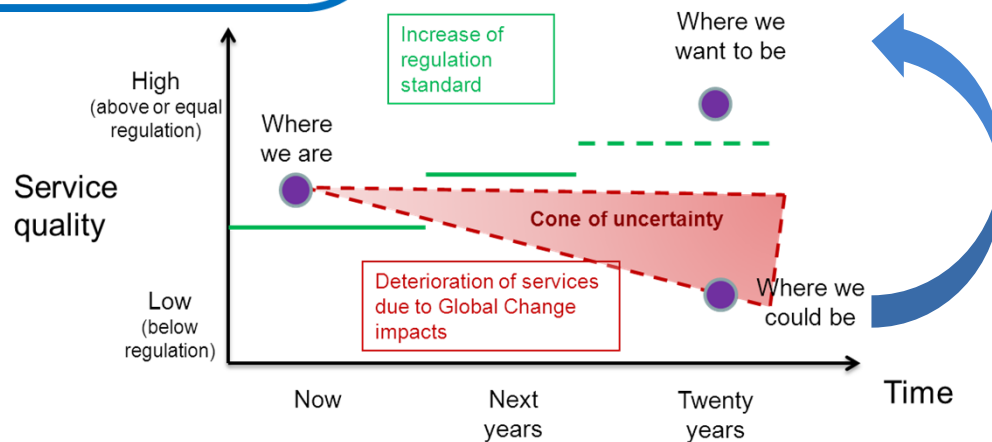
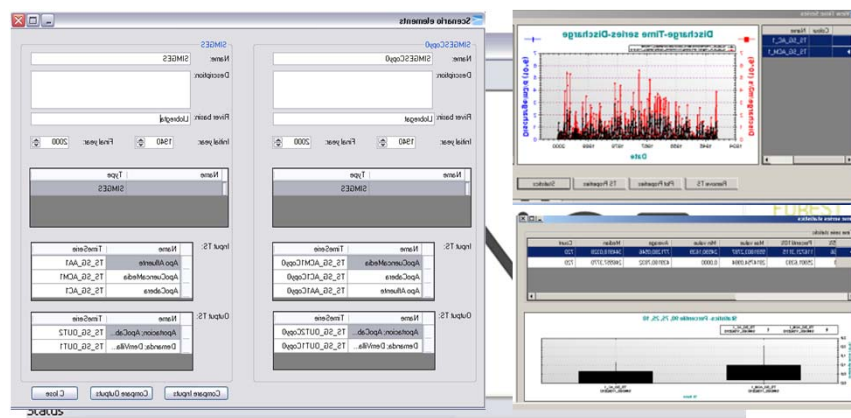
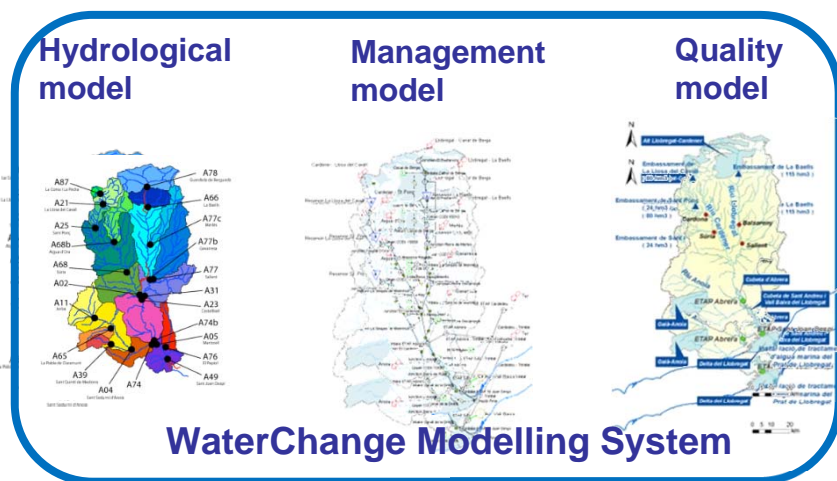
- Resilience of our infrastructure and operation
- Control of future flood risk
- Reliability in water supply
- Etc.

Adaptation actions



Allocation of water resources under changing scenarios

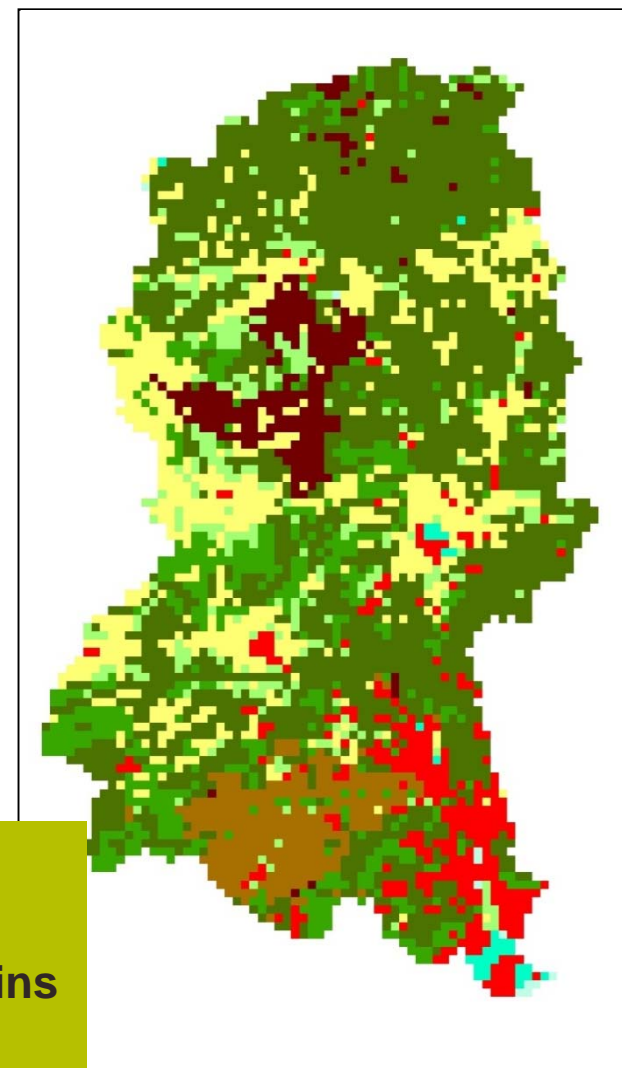
Medium and long term water resources modelling for Global Change adaptation: Application to the Llobregat basin



Hypothesis of change: land use



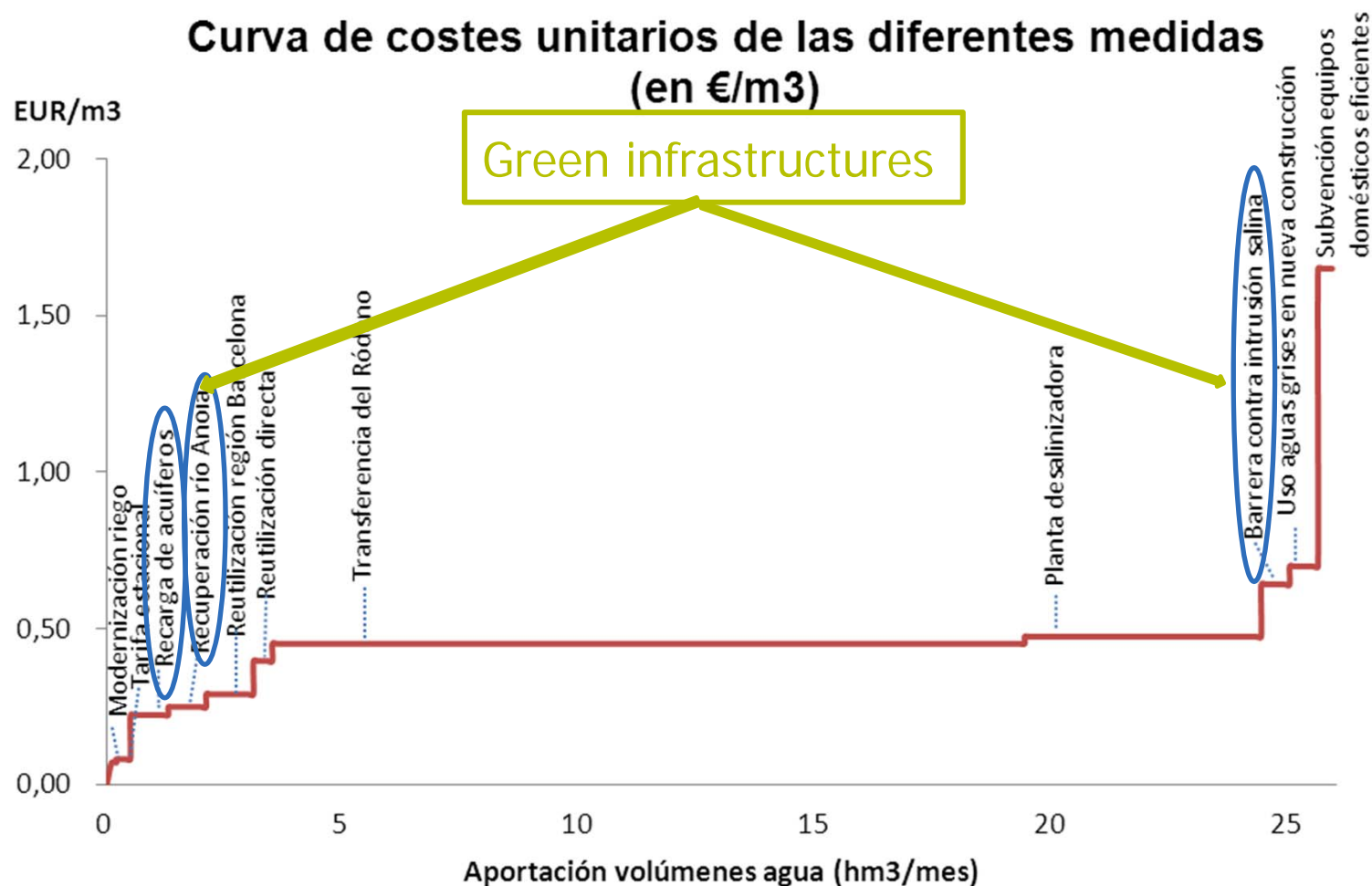
- Use of land use projection
 - EURURALIS project
 - 2000 – 2030
 - Scenarios A1 – A2 – B1 – B2
- Main change: up to 15% increase in forest in the head waters
- Forest increase impact on run off:
Up to -4% runoff by 2100



Land use Scenarios:

- A. No significant change in head water sub basins
- B. Increase of forest area in the head water sub basins
→ decrease of runoff (- 4%)

Adaptation measures considered



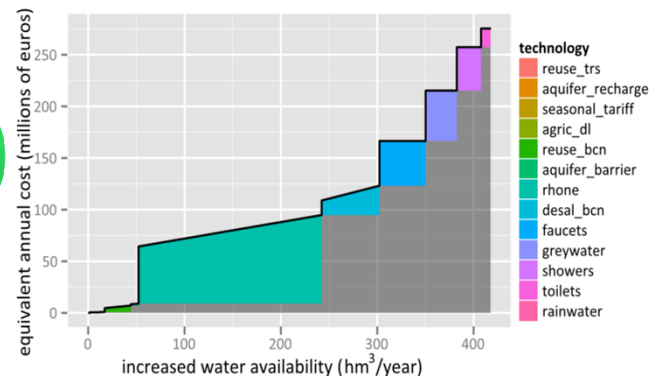
Priorization of strategies



Assess risks

Simulation of the possible futures:
deficit in water supply

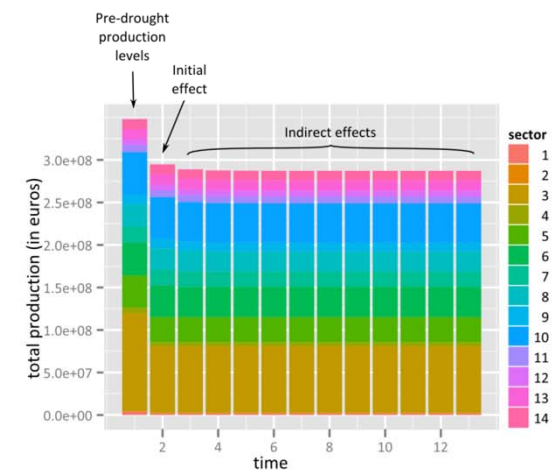
Identify solutions



Appraise solutions

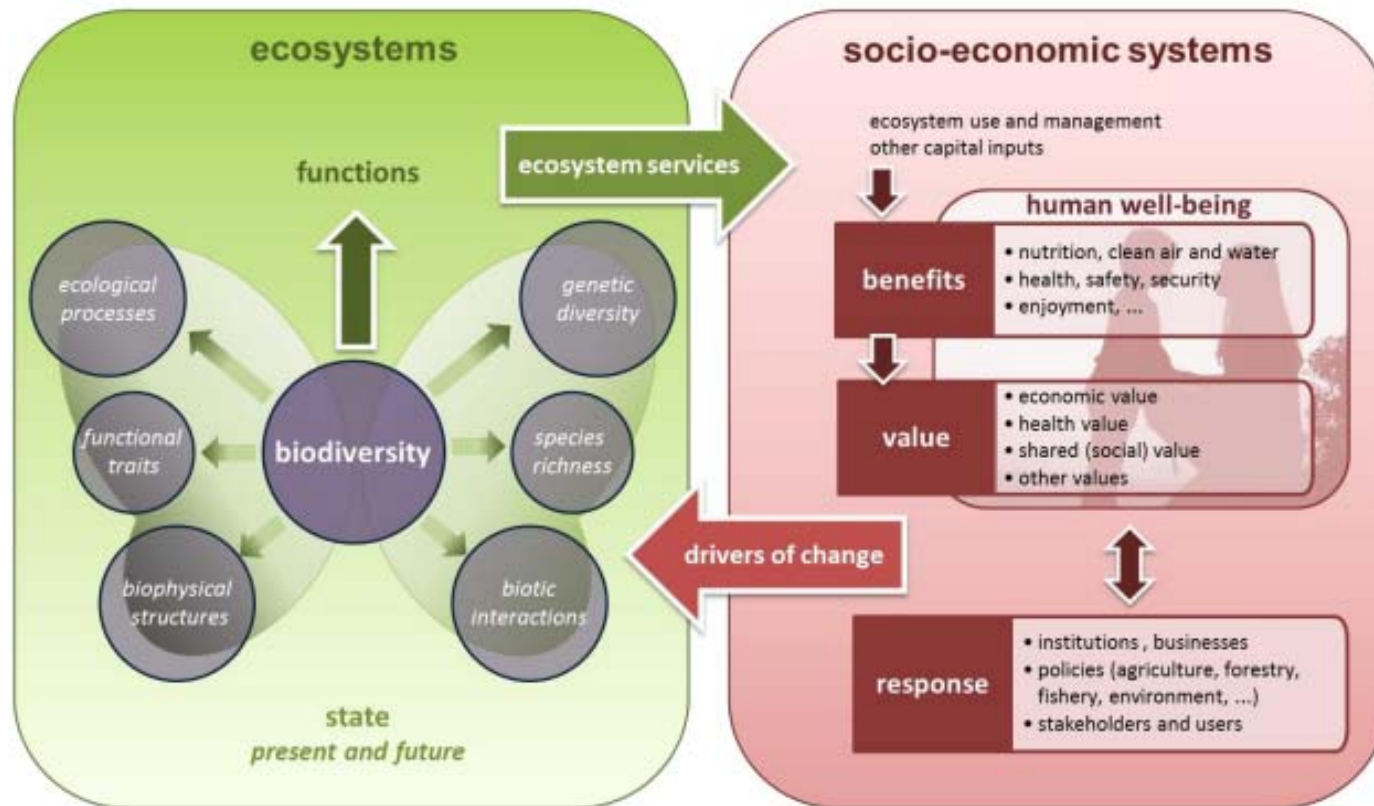
Benefits of adaptation:
avoided costs (direct and indirect)

Efficiency and
cost of the
adaptation
measures



WATER CHANGE: successfully applied in the Llobregat river basin, knowledge diffused within AGBAR, winner of IWA and EU prizes

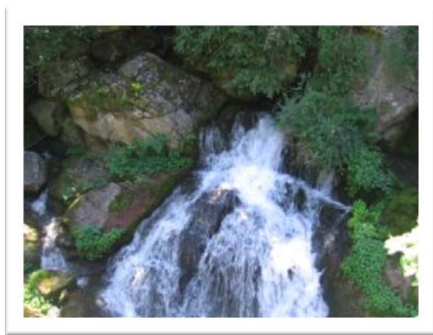
From Cost-Benefit Analysis to Ecosystem Services evaluation



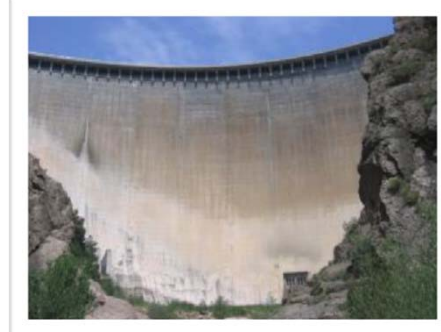
"The benefits people obtain from ecosystems." (Millennium Ecosystem Assessment 2005)

Ecosystem Services in the Llobregat Watershed

Is the management of ecosystem services a viable strategy in urban and technologically sophisticated environments?



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Can the restoration of ecosystem structures and functions influencing stream temperature provide valuable ecosystem services for water treatment managers?

Scenarios: Restoring Riparian Forests & Discharge

Results from PhD thesis of Jordi Honey-Rosés (supervised by Cetaqua and others)

Ecosystem Services: Stream Temperature

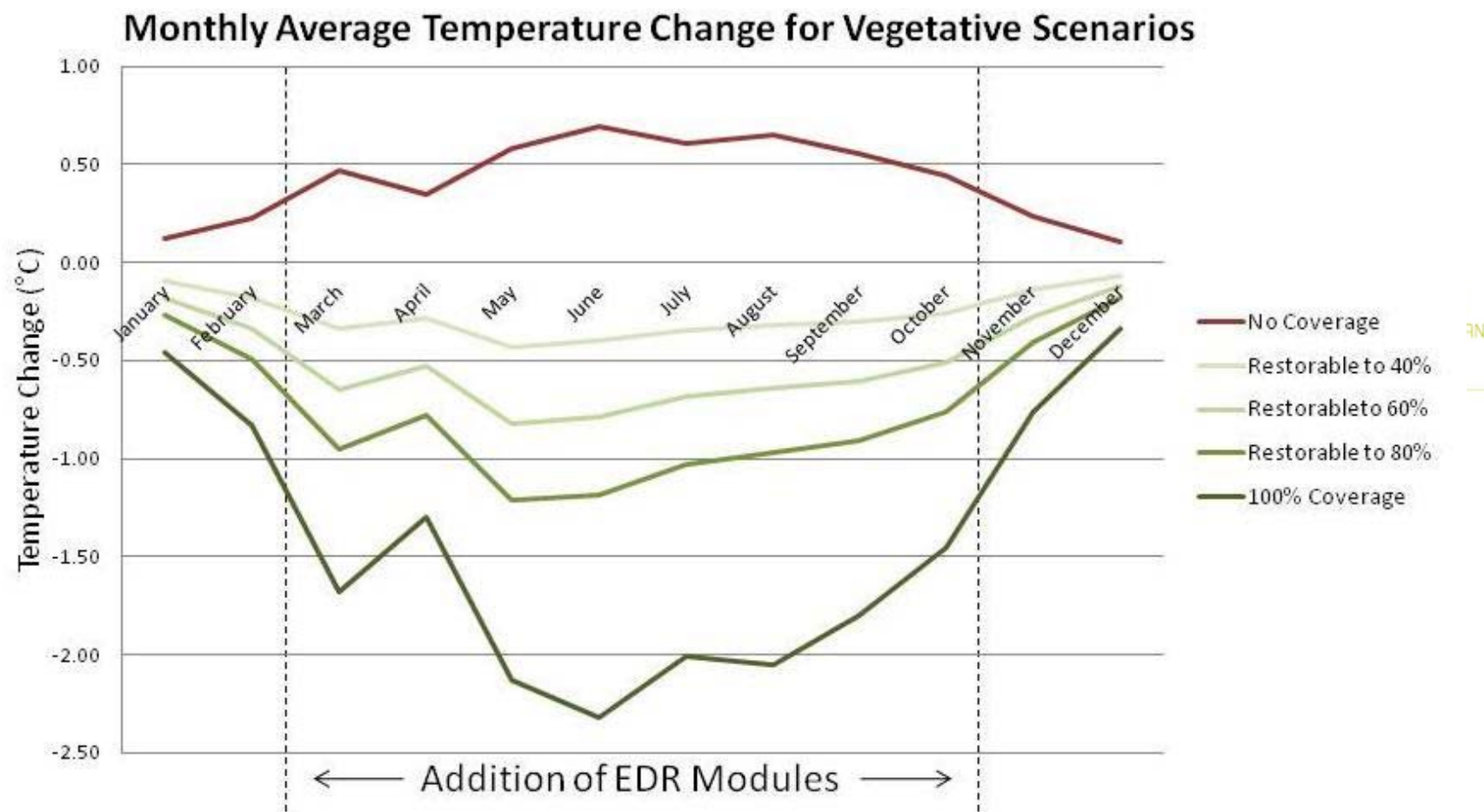
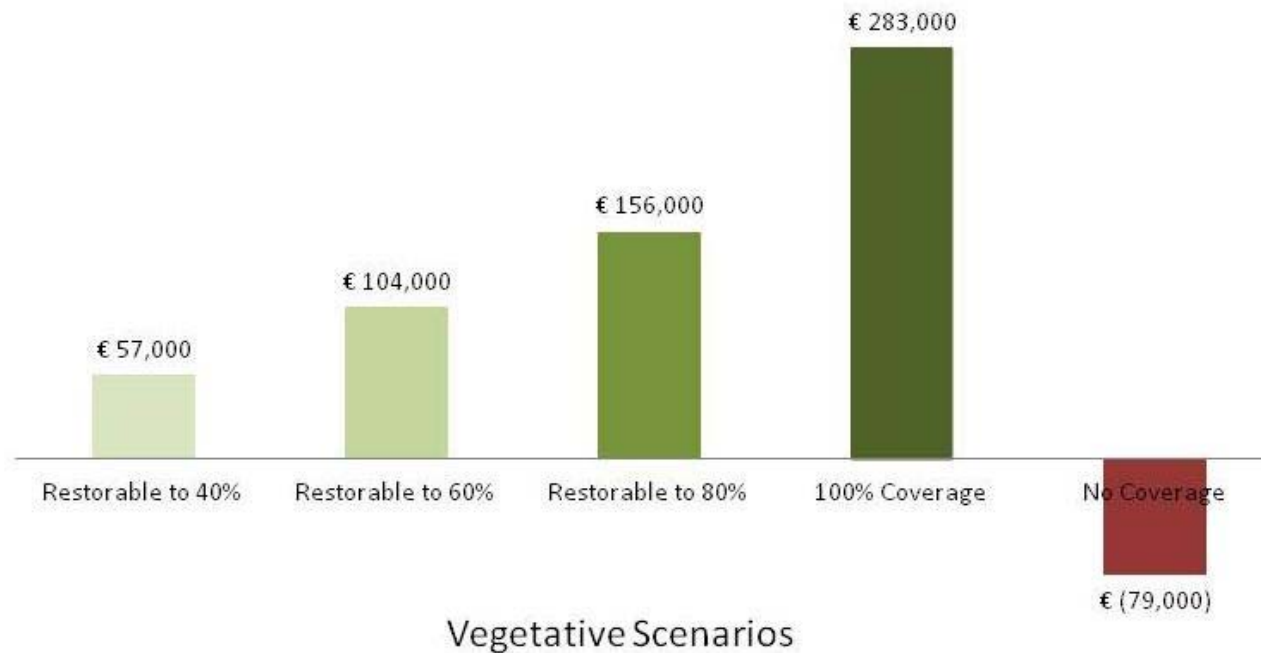


Figure 4.5 Mean monthly temperature changes simulated by SNTMP in the five shading scenarios: (1) existing vegetation coverage removed, (2) riparian forest in restorable areas increased to 40% coverage, (3) riparian forest in restorable areas increased to 60% coverage, (4) riparian forest in restorable areas increased to 80% coverage, (5) 100% coverage in the entire stream reach.

Ecosystem Services: Stream Temperature

Value of Ecosystem Service for Vegetative Scenarios (€/yr)



Value of ecosystem service for the Abrera water treatment plant of various riparian restoration options.

Final thoughts

- New challenges related to climate change make necessary the implementation of an adaptation framework
- The main goals are to increase the resilience of our infrastructure and operation, anticipate risks and maintain the reliability in water supply
- The field of ecosystem services quantifies the returns to investments in ecosystems, so investing in knowledge about ecosystem services will remain a wise management strategy
- Having knowledge and tools to evaluate environmental and economic impact will contribute to push the sustainable development of the company



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