

## INTRODUCTION

### FACT

- ❑ Multipurpose water systems are subject to complex trade-offs among uses
- ❑ Interlinkages between uses in water allocation should be properly identified

### NEED

- ❑ Assess the outputs of hydrometeorological forecasting within a sectoral context (urban, agriculture, energy, environment)
- ❑ Compare the impact of water allocation for each sector

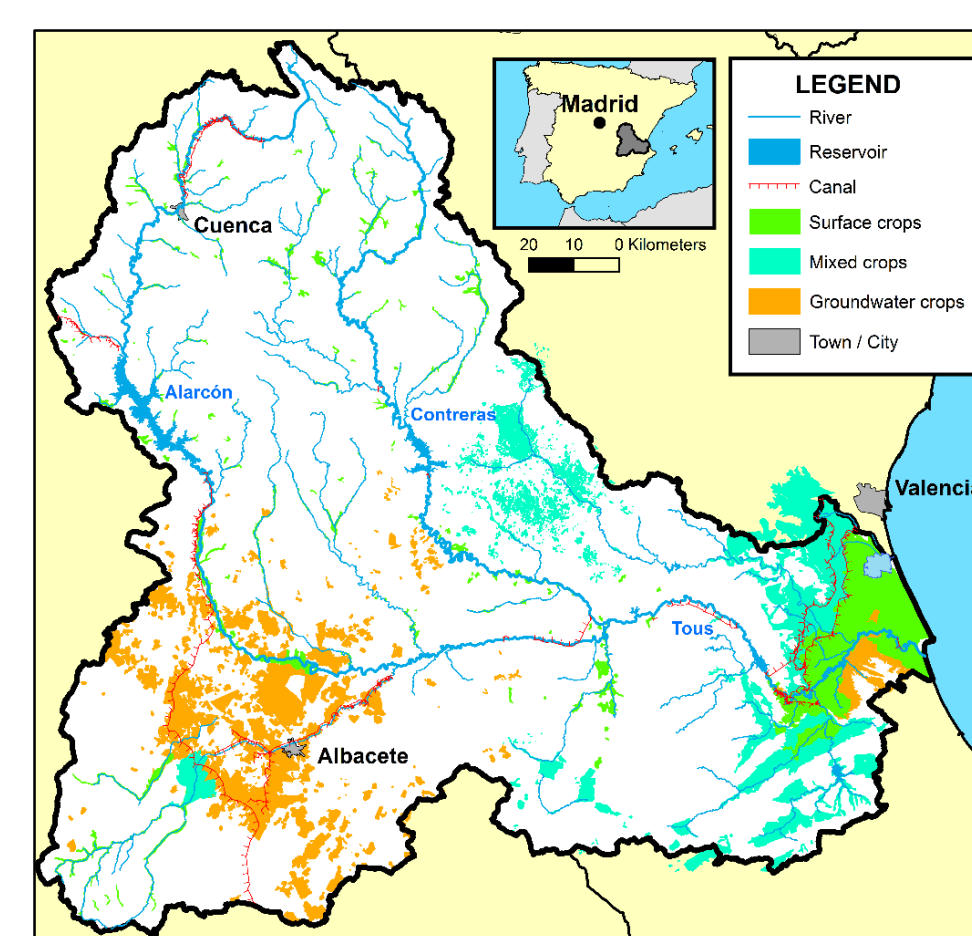
## GOAL & APPROACH

**GOAL:** analyse the economic impacts posed by the implementation of forecast-based allocation rules on the Jucar river system (Spain)

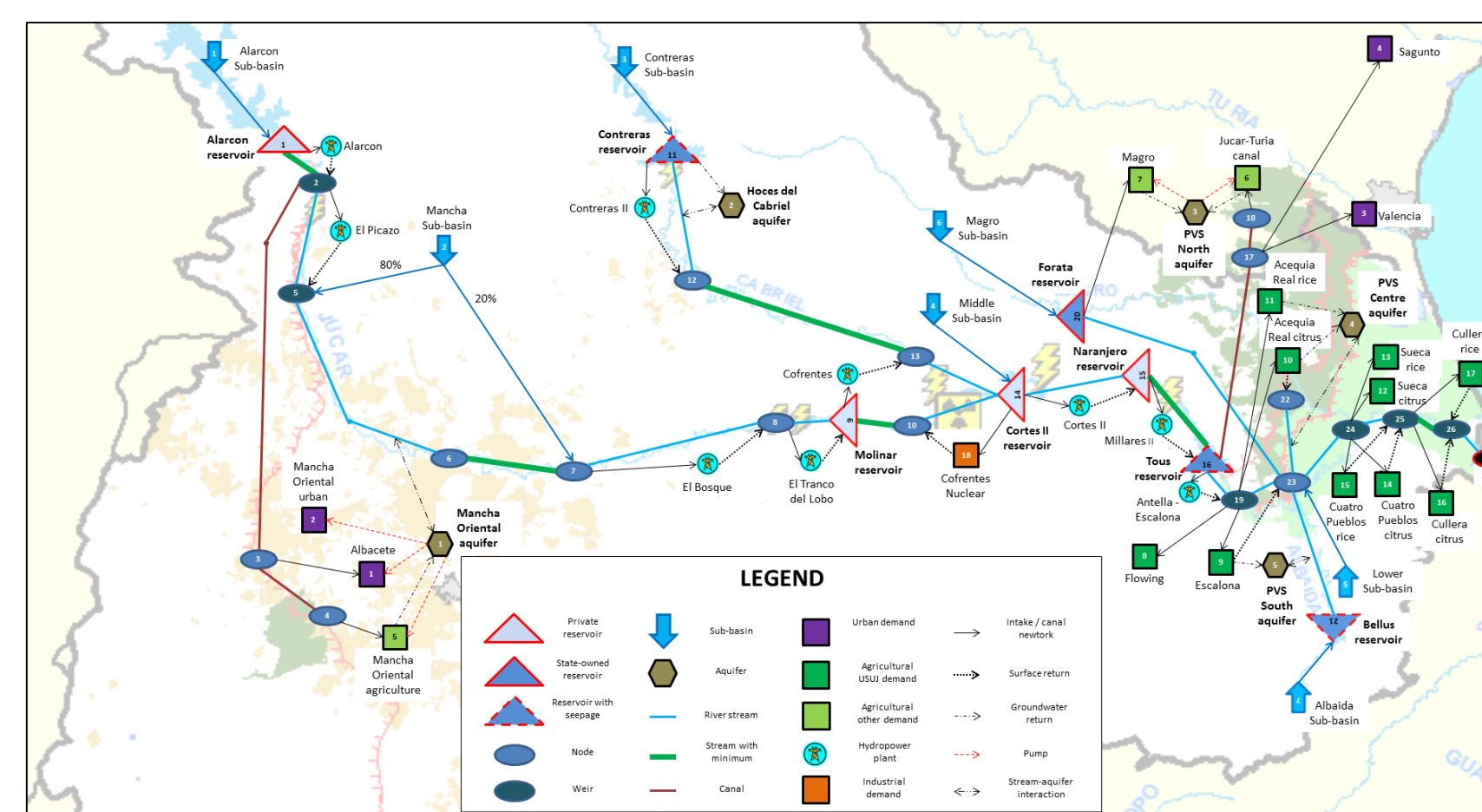
**APPROACH:** combine hydro-economic Stochastic Dual Dynamic Programming (SDDP) with Model Predictive Control (MPC)

## CASE STUDY: THE JUCAR RIVER SYSTEM

### THE RIVER

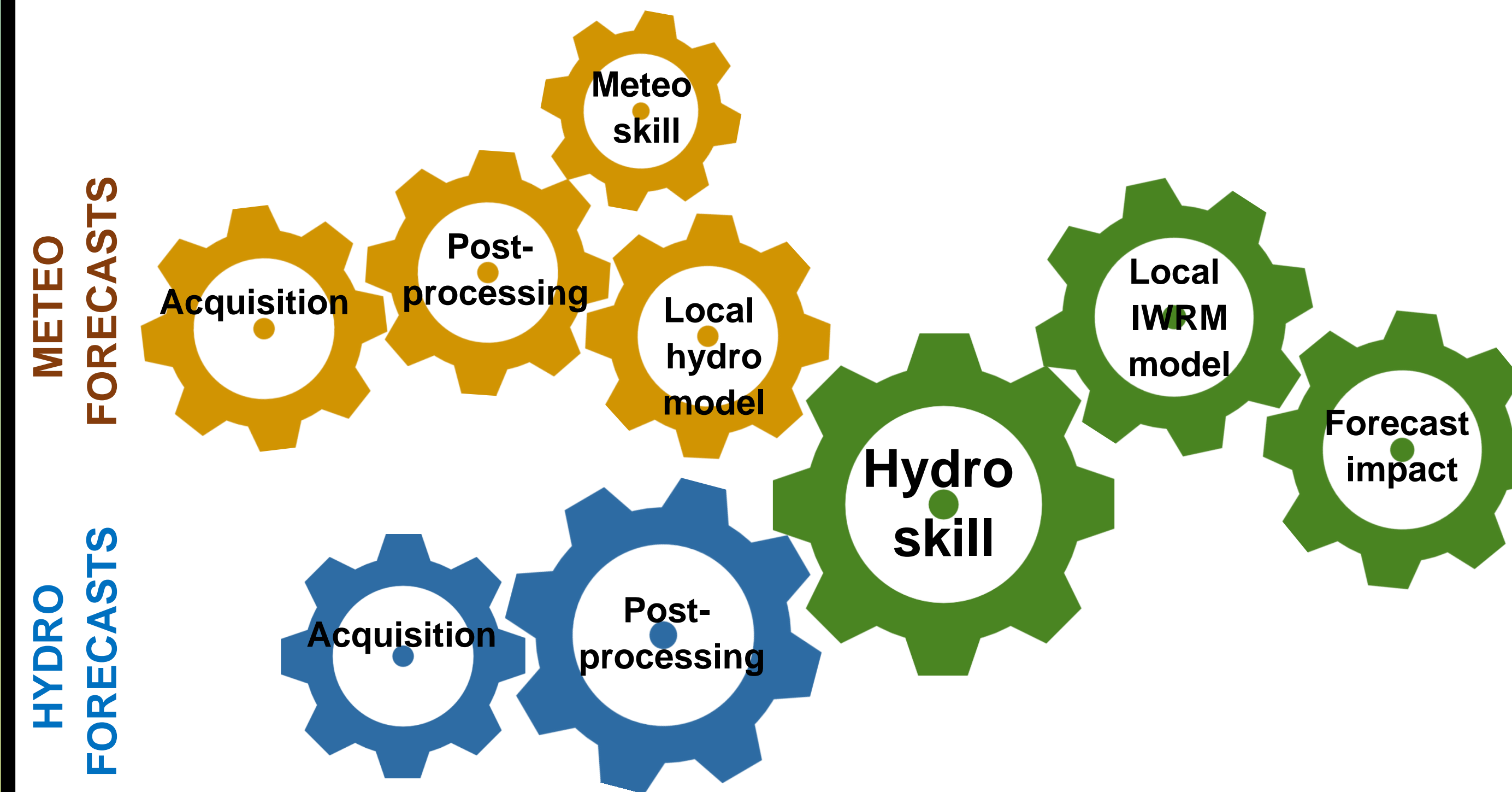


### THE MODEL

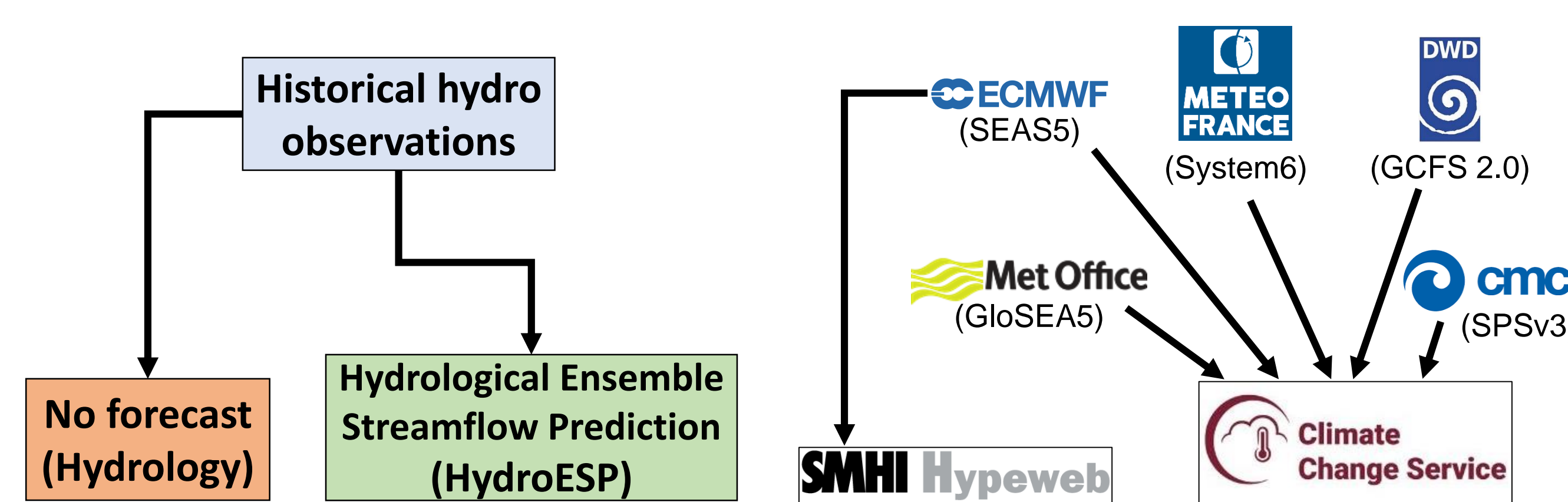


## METHODS & MATERIALS

### OVERVIEW OF METHODOLOGY



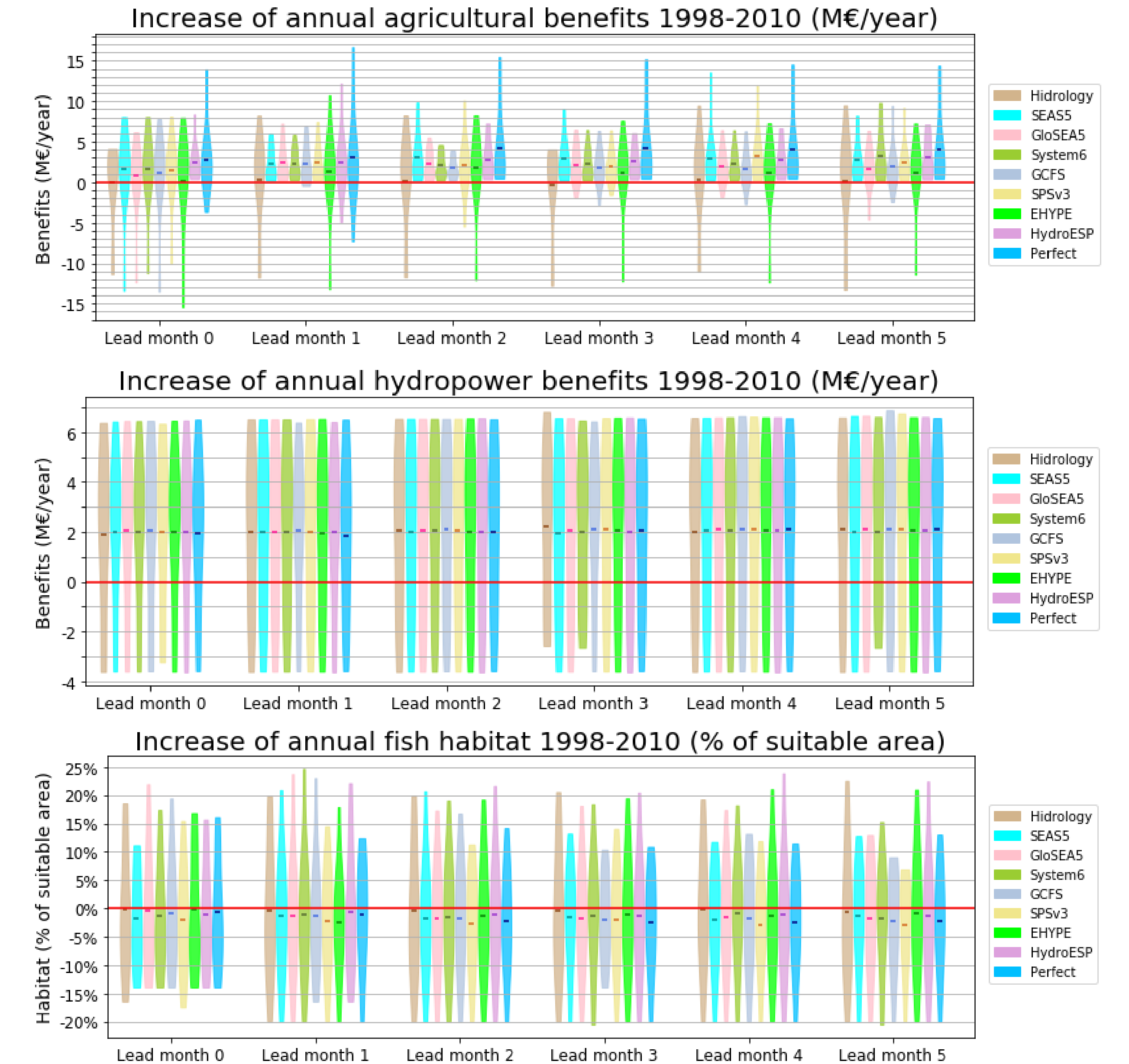
### FORECASTING ALTERNATIVES



### EXPERIMENTAL SETUP

- ❑ Analysis period: 1998-2010 (including a major drought in 2005-2008)
- ❑ Agriculture impact metric: benefits in agricultural demands (demand curves)
- ❑ Hydropower impact metric: energy generation benefits (production and price)
- ❑ Environmental status metric: native fish habitat suitable area (habitat curves)

## RESULTS



## CONCLUSIONS

- ❑ Economic benefits rise for all forecasting systems – **forecasts are valuable**
- ❑ Room for cooperation between agriculture and hydropower (agricultural benefits depend on the particular forecasting system while hydropower revenues do not)
- ❑ Slight decrease of habitat (up to 2%) for all forecasting systems