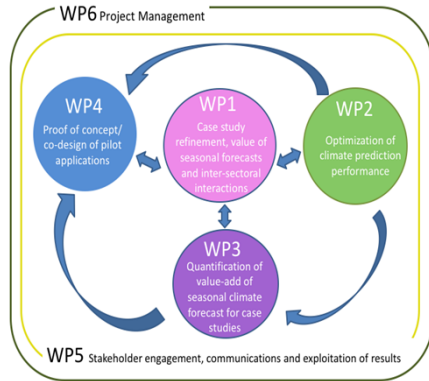


Sushen Shrestha^{1,2}, Mattia Callegari², Felix Greifeneder², Claudia Notarnicola², Mattia Zaramella¹, and Marco Borga¹
 1: Department of Land, Environment, Agriculture and Forestry, University of Padua, Padova, 35020, Italy
 2: EURAC Research, European Academy of Bozen/Bolzano, Institute for Applied Remote Sensing, Viale Druso, Bolzano 1-39100, Italy

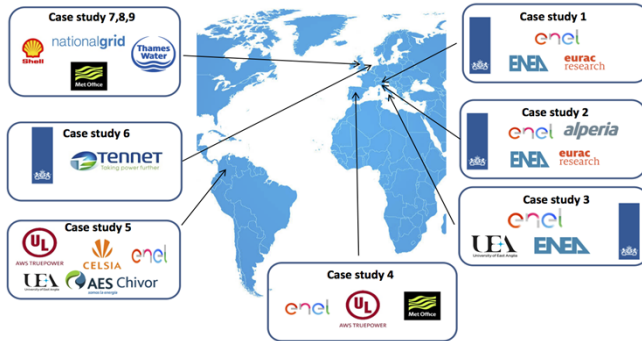
1 FACTS

- **Project name:** The Added Value of Seasonal Climate Forecasts for Integrated Risk Management Decisions
- **Funding scheme:** Horizon2020
- **Time period of project:** 02/2018-08/2021
- **Lead partner:** UNIVERSITY OF EAST ANGLIA (UK)
- **Partners:** 9



2 OBJECTIVES

The central objective of SECLI-FIRM is to demonstrate how the use of improved climate forecasts, out to several months ahead, can add practical and economic value to decision-making processes and outcomes, primarily in the energy sector, but also in the water sector. Improvements in management decisions will ultimately lead to an improved supply-demand balance and therefore to a more efficient energy system, particularly with respect to renewable energy, with corresponding benefits for climate change mitigation.



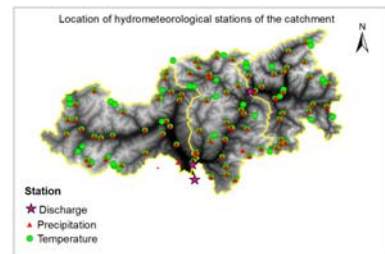
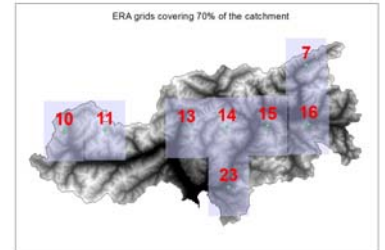
4 THE ROLE OF EURAC

EURAC is involved in WP2 and WP3. Specifically, the EURAC contributions for each of these WPs are:

- WP2:** To develop statistical downscaling techniques for the case study applications for the optimization of climate prediction performances
- WP3:** Quantify the value-add of climate forecasts for case study 2: Dry Winter 2015-16 in the Alps

3 METHOD

- TOPMELT snow pack model was used to validate the ERA-5 precipitation, temperature and snow water equivalent (SWE) over the Upper Adige river basin (6320 km²), Italy.
- 8 ERA-5 grids comprising 70% of the catchment are considered for the analysis for 16 hydrological years (2002 to 2018).
- The catchment was divided into three main sub-basins; Vandoies (1918 km²), Ponte Adige (2120km²) and Bronzolo (2285km²) for the purpose of model simulation.
- 88 raingauges (1 per 72 km²) and 124 temperature gauges (1 per 55 km²) were used.
- The model computes SWE with spatial resolution of 250m. Simulated SWEs are averaged over the ERA-5 resolution(30km) for comparison purposed.
- 500 Monte Carlo simulations were run to take into account the model parameter uncertainty. The 25, 50, and 75 quartiles of SWE from model were calculated.
- The median SWE value from TOPMELT was used to compare the SWE from ERA-5.



4 RESULTS

- Temperature difference range from -3.1°C to 0.89°C.
- In general, temperature errors are fairly well explained by ERA-5 grid elevation errors
- The precipitation is always overpredicted by ERA-5.
- SWE is generally overestimated by ERA-5. with bias ranging from 6% to 96%, depending on grid.
- The Nash-Sutcliffe efficiency (NSE) has both positive and negative value, ranging from -0.92 to 0.44.

