

Statistical downscaling of climate scenarios for the impact communities. *A CMIP5 perspective.*

Marco Turco, CMCC

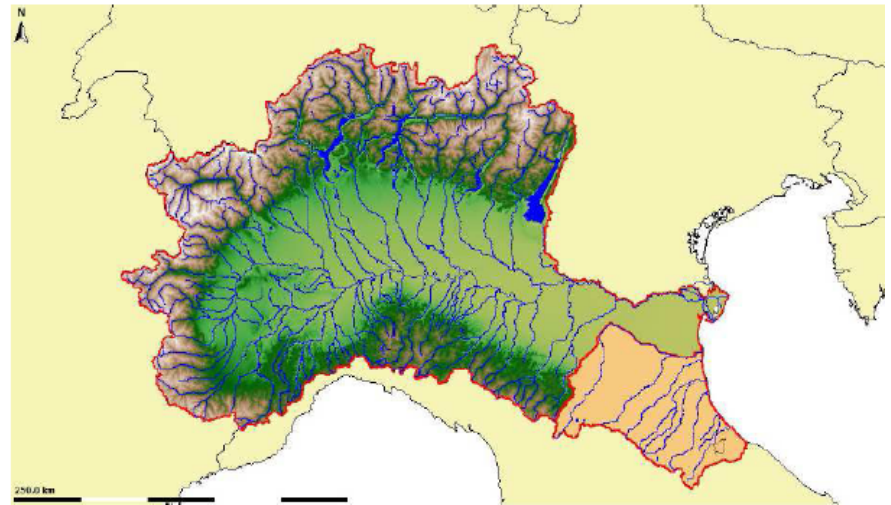
Workshop IS-ENES
Paris, October 16-17th, 2012



Workshop IS-ENES

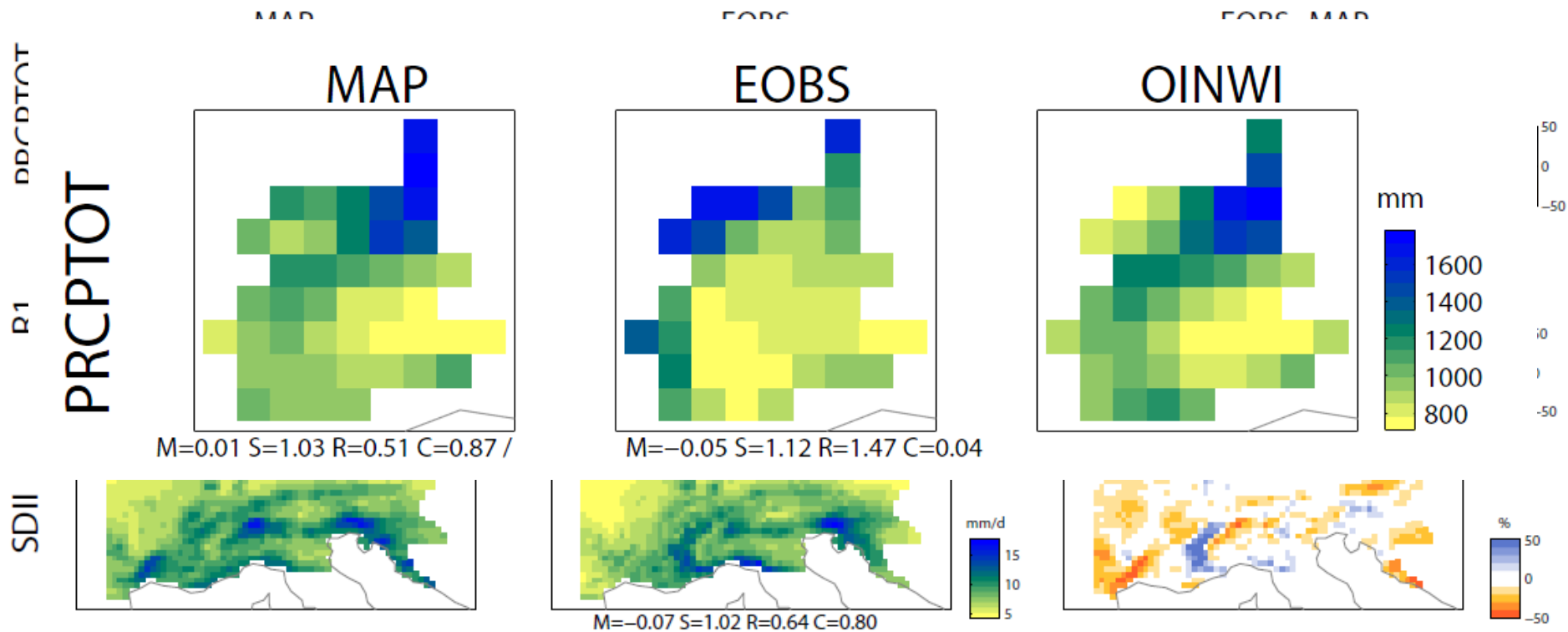
Can we apply a GCM-RCM-MOS model chain to study the impact of climate change on hydrology?

- **Domain:** Po basin
- **RCM:** COSMO-CLM (Bucchignani et al. 2011)
- **MOS:** “MOS analog “ (Turco et al. 2011)
- **HYDRO:** Hydrological and Hydraulic Models in Po Flood Early Warning System (PO-FEWS)
- **OBS:**main limitation... (Turco et al. Assessing daily gridded observations for precipitation extremes studies in alpine areas. Paper in preparation)
- **Some preliminary results →**



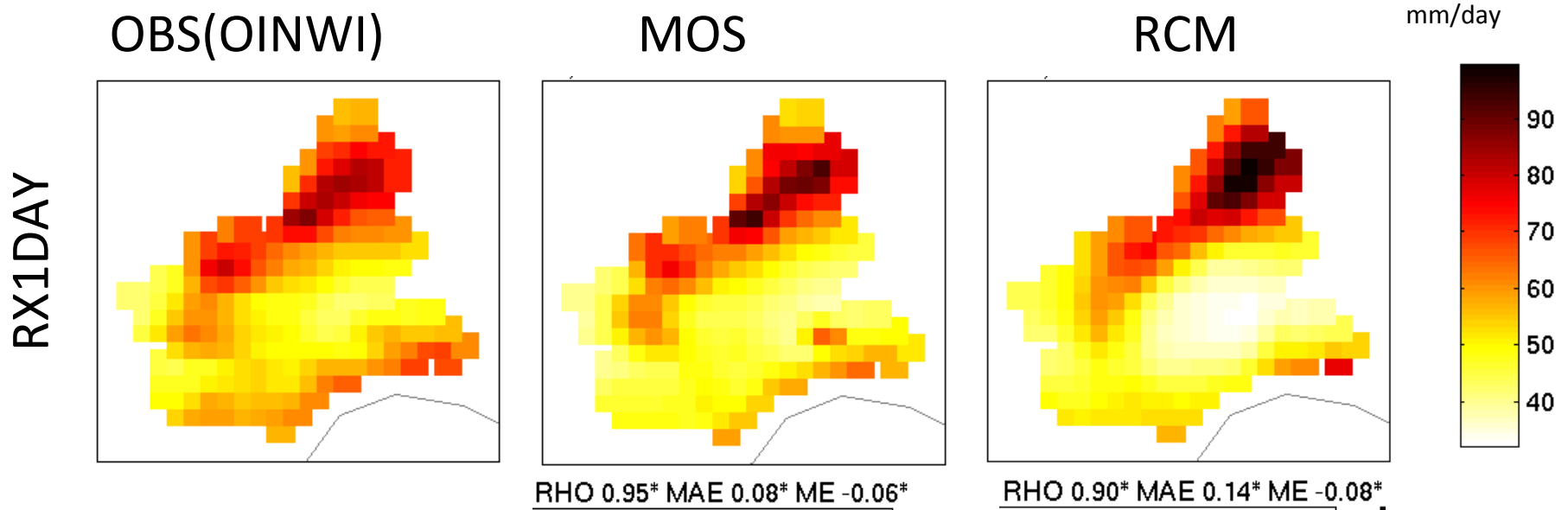
Preliminary results

1. Assessing daily gridded observations



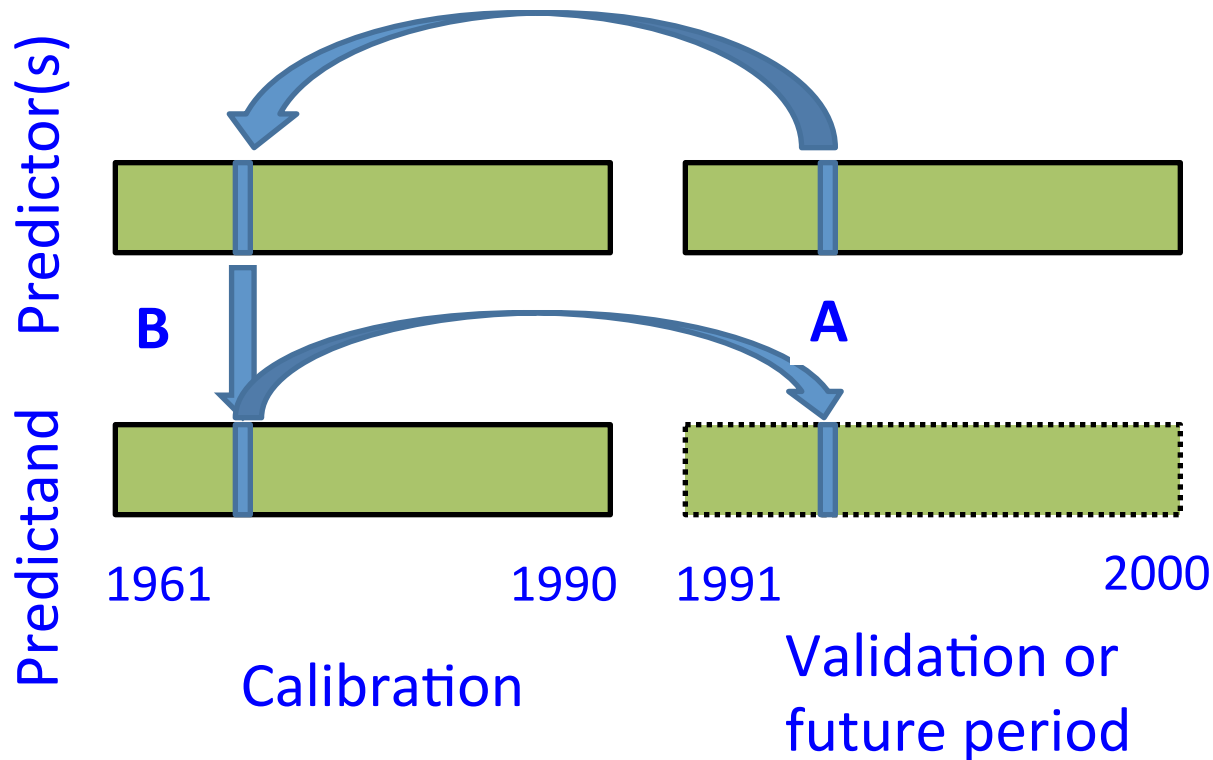
Preliminary results

2. ERA40-RCM-MOS results



MOS Analog Method

This method assumes that “analogue” weather patterns (predictors) should cause “analogue” local effects (predictands)



For each day in the test period:

1. The closest (analogue) day (in terms of **RCM simulated precipitation** patterns over Spain) to the test day is selected within the training period considering the Euclidean distance
2. Then, **the local scale precipitation pattern (Spain02) of the analogue day** found in the previous step is used as the fine scale pattern for the test day.



MOS Analog Method

- Overall, the MOS analog method **is able to calibrate and downscale** several RCMs
- It maintains the **spatial coherence** of the precipitation fields (which is very important for hydrology),
- it is **parsimonious** (so that one can assume that it is also robust) and **transferable** (since it performs well in the different climates of Spain). Preliminary results over NW Italy seem confirm this point.
- Needs to more test for **temperature**, especially regarding the stationarity hypothesis



Thanks

