

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

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# Assessment of climate changes effects on soil risks

## CLIMATOLOGICAL SIMULATIONS

STEP 1: RCM driven by ERA40 reanalysis (period 1971-2000)

- After this simulation, the **MOS technique** is applied to correct the RCM systematic error on the area of interest, using the **observation dataset**.

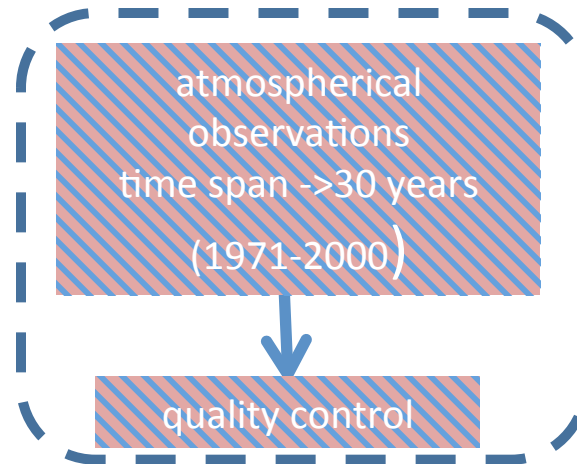
STEP 2: RCM driven by GCM model (period 1971-2000)

- After the simulation at step 1, the MOS technique is applied to correct the GCM+RCM systematic error on the area of interest.

STEP 3: RCM driven by GCM model (up to the end of XXI century)

- After the simulations at step 1 & 2, future climate projections are performed using RCM + GCM under different CO2 emission scenarios.
- Finally, a bias correction technique is applied to the results, taking into account the results of step 1 and step 2

## Observation Dataset



**MOS technique (see slides Marco Turco)**

**MOS realizes:**

- **RCM bias correction.**
- **Downscaling to improve spatial resolutions (from several km to hundreds of meters), as required by slope stability numerical model**

**PROCEDURE PROVIDING CLIMATE SCENARIOS FOR IMPACT SIMULATIONS SUCH AS:**

- **FLOOD**
- **FOREST FIRES**
- **LANDSLIDE**



# CLIMA

reanalysis run:  
COSMO CLM driven  
by ERA40 dataset  
observations

bias correction procedure

GCM global  
climate  
model

CO2  
emission  
scenarios

RCM analysis on future  
time span

future  
scenarios

downscaling techniques  
to improve spatial  
resolutions (from several  
km to hundreds of  
meters)

atmospherical observations  
time span ->30 years  
(1971-2000)

quality control

# IMPACTS

datasets of monitoring  
data related to slope  
cinematic behavior (trigger  
time, displacements data)

stratigraphy, soil  
hydromechanical  
properties

physically based numerical  
resolution of equations regulating  
soil hydromechanical behavior in  
order to reproduce observed  
slope behavior

*Cervinara case-history*

Assessment of climate changes effects on the slope stability