

# Climate Project



Graziano Giuliani  
International Centre for Theoretical Physics - Trieste Earth  
System Physics Section

ICTP - Earth System Physics Section

Workshop on Advanced Techniques for Scientific Programming  
and Management of Open Source Software Packages  
Trieste, 10 Mar - 21 Mar 2014

# The Committent



- The Earth System Physics Section ESP of ICTP
  - The Regional Climate Model is developed at ICTP
  - Retrieve GCM data from remote sites and prepare RegCM ICBC
  - Run RegCM model on multiple domains
  - Extract publication ready plots from output
  - An increasing volume of data from Global Model
  - An increasing volume of data from Regional Climate Model
  - An increasing number of users download data from ICTP proxy
  - A naïve set of tools to build Initial and Boundary Conditions
  - A naïve set of tools for data Analysis and Visualization



# The Project(s)

## Python projects !

- ① Create a new Terrain / ICBC for RegCM model in Python using:
  - netCDF4 <https://github.com/Unidata/netcdf4-python>
  - ESMP <https://earthsystemcog.org/projects/esmp>
- ② Create a new Postprocessing for RegCM model output using:
  - netCDF4 <https://github.com/Unidata/netcdf4-python>
  - ESMP <https://earthsystemcog.org/projects/esmp>
  - cartopy <http://scitools.org.uk/cartopy>
  - matplotlib <http://matplotlib.org>

Wait !

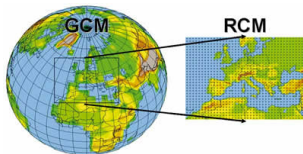


- Only one of the two projects can be realized...

# Challenges of Project 1 : The Pre-Processing



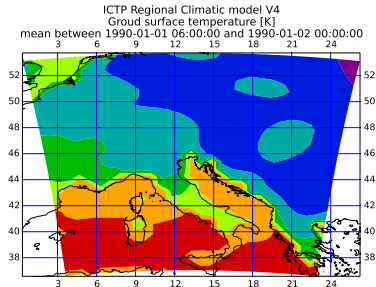
- Quirks of different GCMs
- Move users to the CMIP5 Earth System Grid sites for input data
- Regridding to a projected grid
- Horizontal and vertical interpolations involved
- The output file must be readable by the RegCM



# Challenges of Project 2 : The Post-Processing



- Create a processing tool to convert data in CORDEX format
- Extract relevant statistics from data (mean, extremes, indices)
- Create plots to compare data to regrided observation datasets
- Distribute data for researchers worldwide



# Reward



- The developed tools will be available in the RegCM community !

Enlist !