

EGU21-7029, updated on 04 Aug 2021

<https://doi.org/10.5194/egusphere-egu21-7029>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Regional climate projections and associated climate services in the southwest Indian ocean basin

Marie Dominique Leroux, François Bonnardot, Stephason Kotomangazafy, Philippe Veerabadren, Abdoul Oikil Ridhoine, Samuel Somot, Antoinette Alias, and Fabrice Chauvin

METEO-FRANCE, Climatology department, Réunion (mariedominique.leroux@gmail.com)

In the former Cordex program, regional climate models were run over Africa and only covered the western part of the South Indian Ocean at a coarse 50-km resolution while a 12-km resolution was used for Europe. A 50-km resolution is insufficient for island territories as small and steep as those in the Indian Ocean. Yet this area is especially vulnerable to natural catastrophes related to the effects of climate change: it is the third region in the world most affected by extreme climatic events. The need for climate services over that populated area has now become a critical issue.

Both dynamical and statistical downscaling from a few ongoing CMIP6 simulations were therefore used to obtain regional climate information on a large area of the southwest Indian Ocean that includes most of the inhabited countries from the coasts of Mozambique (33°E) to 74°E as well as the main area of tropical cyclone genesis [2-28°S]. The limited area model ALADIN was implemented in its climate version at 12-km resolution and the first runs were coupled by outputs from one of the CMIP6 Earth Simulation Coupled Models named CNRM-ESM2-1.

We will present the numerical and statistical tools used for this regional climate study as well as the first projections obtained for ssp126 (RCP2.6), ssp245 (RCP4,5) and ssp585 (RCP8.5) scenarios over the 2015-2100 period. Results will be illustrated for the southwest Indian ocean basin as well as for the main islands of the IOC member countries: Madagascar, Reunion, Mauritius, Seychelles, and Comoros where observations over the 1981-2010 period were used for model bias correction using the quantile-quantile matching method. For climate uncertainty representativeness, the 2015-2100 evolution of both ALADIN and CNRM-ESM2-1 temperature and precipitation averages over our region will be compared to that of the other available CMIP6 simulations.

This work is part of the BRIO (Building Resilience in the Indian Ocean) project which aims at supporting the Indian Ocean Commission (IOC) member countries in the implementation of their adaptation policies with respect to climate change (regarding water resources, health and other issues). This project will provide a set of high quality climate-related data on a free-access online regional portal as well as climate services. It is funded by the Agence Française de Développement (AFD), through the Adapt'Action Facility, in cooperation with the IOC.

