Web-based data-driven visualization of the MGClimDeX project climate datasets: an integrated perspective of climate change impact on natural resources in highly vulnerable regions.

Jorge Martinez Rey (1), Patrick Brockmann (2), and Patricia Cadule (3)

(1) GraphicPrototype, A Coruna, Spain (jorge@graphicprototype.net), (2) LSCE, Laboratoire des Sciences du Climat et de l'Environnement, LSCE/IPSL, CEA-CNRS-UVSQ, Université Paris-Saclay, 91191 Gif-sur-Yvette, France. (patrick.brockmann@lsce.ipsl.fr), (3) Institut Pierre Simon Laplace, CNRS, Université Pierre et Marie Curie, Université de Versailles Saint-Quentin-en-Yvelines, Case 101, 4 place Jussieu, 75252 Paris cedex 5. France. (patricia.cadule@lsce.ipsl.fr)

Big datasets have been made available over the last decade to characterize the climate system, particularly describing its large number of related physical and biological variables. These datasets include in-situ observations and measurements, remote sensing data, model output or meteorological data among many other data sources. Moreover, climate data spans across different orders of magnitude regarding space and time.

When focusing on the potential impacts of climate change on a particular vulnerable region such as the Caribbean, the selection of a subset of all this data is required. Moreover, it is of particular importance an intuitive description of the variables that are available, and also the space and time domains related to the scope of a regional project.

The Martinique and Guadeloupe Climate Dynamic Downscaling Experiment (MGClimDeX) project, which assesses the climate change impact on the Lesser Antilles, will provide tools and means to help the key stake-holders -responsible for addressing the critical social, economic, and environmental issues- to take the appropriate adaptation and mitigation measures. This will allow to prevent future risks associated with climate variability and change, and its role on human activities. The MGClimDeX project will do so by using regional and global model output and data visualization techniques, showing the cross-connected impacts of climate change on various sectors (agriculture, forestry, ecosystems, water resources and fisheries).

We present a web-based, data driven platform to explore the characteristics of all the available climate datasets on the Caribbean region. This will help the modeling community within the project to find the precise forcings and observations for the model runs, and the time domains in which the simulations could be run. To this end, we use back-end data processing and front-end web-based visualization techniques, going from meteorological data, records and reanalyses, remote sensing data, and global and regional model hindcasts and forecasts, to highly interactive data visualizations on browsers. We use the well-known javascript library D3.js in combination with Bokeh, a Python library, to synthesize the data, all framed in the essential HTML+CSS scripts.

In this way, the full scope and aim of the MGClimDeX project is made available to the public in general and policymakers in particular.