Luz Adriana Gómez

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EDUCATION

STEP fellow Sep. 2022 – Jun. 2023
The Abdus Salam International Centre for Theoretical Physics (ICTP) Trieste, Italy
ESP - Earth System Physics Group

Master of Science Water Resources Engineering Jul. 2015 – Apr 2018
Universidad Nacional de Colombia Medellín, Colombia
Thesis: *Characterization of terrestrial water storage variability in Northern South*
America using satellite retrievals, hydrological models and climate change projections

Civil Engineer Apr. 2008 – Dec. 2012
Universidad Industrial de Santander Bucaramanga, Colombia

WORK EXPERIENCE

Junior Researcher Jan. 2024 – ongoing
CMCC Foundation - Institute for Climate Resilience (ICR) Caserta, Italy
Regional Models and geo-Hydrological Impacts (REMHI) Division
- Use of data-driven approaches to investigate the potential impacts of climate change on IDF curves.
- Use of CORDEX outputs to analyze potential impacts of climate change on infrastructure design parameters mainly related with extreme temperature, precipitation, and wind speed.

Master's student / Scientific Coordinator Oct. 2015 – Dec. 2023
Universidad Nacional de Colombia Medellín, Colombia
Study of the water resource variability and sediment management
in the basins of interest to ISAGEN
- Assessing the influence of climate change in ENSO features and its impacts on water availability for hydroelectricity generation, using CMIP6 outputs.
- Implementing statistical techniques for downscaling and bias correction of CMIP and CORDEX information for variability and climate change analysis.
- Performing the study of climate change impacts on hydro-climatic variables in Colombia using regional climate models, machine learning algorithms, and hydrological simulations.
- Carrying out the characterization of hydro-climatic variability at inter-annual, seasonal, and intra-seasonal timescales, using satellite and reanalysis data.
- Development and improvement of seasonal and sub-seasonal streamflow forecasts using rainfall-runoff models, machine learning techniques, and bias correction methodologies. As inputs in-situ and satellite data were considered, as well as CFS and ECMWF forecasts.

Scientific Coordinator Oct. 2017 – Jul. 2019
Universidad Nacional de Colombia Medellín, Colombia
Methodological strategy for the analysis of climate variability and change scenarios
in EPM's areas of interest at different spatial and temporal scales.
Phase II of the climate change study
- Implementing a strategy for the study of climate change impacts using global climate models and dynamical downscaling with WRF.
- Data analysis of climate change projection focused on hydrological and atmospheric variables.
- Analysis of hydro-climate variables under future land-cover and climate change scenarios.

Climate change projections analyst   Sep. 2019 – Nov. 2019
SIATA, Universidad EAFIT   Medellín, Colombia
Inter-administrative agreement to join efforts for the monitoring and modeling of
hydrometeorological, geotechnical and seismic variables, and the development of an
information system for the DAGRD

- Performing the analysis of potential climate change impacts on atmospheric variables in Medellín city to assess physical risks and natural hazards in the 21st century.
- Carrying out the analysis of biophysical vulnerability for the Aburrá Valley and Antioquia based on climate change scenarios.

PUBLICATIONS

- Padulano, R., Gomez-Mogollon, L. A., Napolitano, L., & Rianna, G. (2025). *Quantile-based bias-correction of extreme rainfall: Pros & cons of popular methods for climate signal preservation.* Journal of Hydrology, 132814.

SELECTED CONFERENCES AND PRESENTATIONS

Updating IDF curves in the context of climate change:
approaches, limitations, and uncertainty assessment   July 2024
6th International Conference on Advances in Extreme Value Analysis
and Application to Natural Hazards, EVAN Conference 2024   Venice, Italy

Streamflow forecasting using an integrated methodology
based on rainfall-runoff modeling, precipitation ensemble
predictions and machine learning techniques   September 2022
12th International Workshop on Statistical Hydrology, 2022   Chia, Sardinia (Italy)

Extreme Precipitation in the Present and Future Climate over a
Topographically Complex Region in a Tropical Environment   January 2020
AMS 100th Annual Meeting, 2020   Boston, MA

Assessment of climate change in terrestrial water storage over
the Magdalena-Cauca basin   December 2018
AGU Fall Meeting 2018,   Washington DC

TEACHING EXPERIENCE

Adjunct faculty   Jul. 2019 – Jun. 2020
Hydrology and climatology   Medellín, Colombia
Universidad de Medellín, Faculty of Engineering

SKILLS

Languages: Spanish (Native), English (C1)
Programming: Python - NumPy, pandas, Scikit-learn, cartopy, netCDF4, xarray, scipy, ...
Document Creation: Microsoft Office, LaTex
Experience of working on Linux, OS, and Windows operating systems.
Geographic information systems: ArcGIS, QGIS