



Advertisement

Internship and Young Professional Program

Climate Data and Forecasting for Hydrological Analysis in the Eastern Nile Region

**Regional Climate Resilience Program (RCRP) for East & Southern Africa Project, 4th Internship Batch
(31st ENTRO Internship Batch)**

1. Background

ENTRO Internship and Young Professionals Program: ENTRO has proactively established the Internship and Young Professionals program as part of its core activities and has successfully implemented it since 2010. The program has enabled ENTRO to strengthen engagement with member countries through partnerships with scientific communities and practitioners, promoting knowledge sharing and capacity building. Up to now, 30 different batches of internships and young professionals have been implemented over the last 15 years.

2. OBJECTIVE

The main objective of the program is climate and weather data collection, processing, analysis, visualization, and application for hydrological analysis and flood forecasting in the Eastern Nile sub-basin. Advertisement

3. Duties and Responsibilities

Task 1: Weather data collection, quality control, and database development

- Compile historical and near-real-time weather, satellite, and reanalysis datasets relevant to hydrological analysis, including rainfall, temperature, evapotranspiration, river discharge, and water level data using global datasets such as GPM IMERG, CHIRPS, TAMSAT, ARC2, ERA5/ERA5-Land, GLDAS, GPCC, GHCN, and HydroSHEDS.
- Conduct data screening, quality control, gap identification, consistency checking, and preparation of metadata for climate and hydrological datasets.
- Develop a structured hydrometeorological database for EN sub-basins, ensuring clear naming conventions, temporal coverage, spatial references, and data-source documentation.
- Prepare a data gap assessment identifying missing records, priority stations, data access limitations, and recommendations for improving climate and weather data availability for hydrological applications.
- Analyze rainfall and temperature variability, seasonal patterns, anomalies, and trends using statistical and geospatial methods.
- Compare various dataset products, including observed, satellite-based, and model-based products, to assess suitability for hydrological analysis.
- Prepare maps, charts, time-series plots, and concise technical notes communicating weather conditions relevant to hydrological analysis.

Task 2: Global/Regional Numerical Weather Prediction Datasets for Flood Forecasting

- Retrieve and download datasets from Global/Regional Numerical Weather Prediction products such as NOAA GFS and WRF
- Define spatial and temporal boundary conditions, including forecast lead times and temporal frequency
- Analyze and read multidimensional GRI/NetCDF Global/Regional Numerical Weather Prediction products
- Configure the Weather Research and Forecasting (WRF) Numerical Weather Prediction for the EN sub-basin
- Interpolate native model grids onto the EN sub-basin domains
- Extract flood-critical variables essential for flood routing, such as total precipitation, temperature, soil moisture, and evapotranspiration
- Perform bias correction by applying statistical adjustment techniques using historical gridded reanalysis datasets or observations

Task 3: Climate change impact analysis on floods in the Eastern Nile Sub-basin

- Collect baseline data (observed rainfall, temperature, streamflow, water level, evapotranspiration, land use, soil, DEM, reservoir, and water demand data) using station data, satellite rainfall products, reanalysis datasets, and hydrological records.
- Assess historical rainfall and temperature patterns, climate variability, trends, anomalies, extreme rainfall events, historical river flow and flood peaks to establish a historical climate and hydrological baseline.
- Select global or regional climate model datasets such as CMIP6, CORDEX-Africa, or downscaled climate products and select emission/development scenarios such as SSP1-2.6 and SSP2-4.5.
- Downscale and bias-correct climate projections applying downscaling methods to validate historical climate data against observations.
- Prepare rainfall, temperature, evapotranspiration, land use, soil, DEM, river network, and basin boundary datasets to prepare inputs for a hydrological model
- Set up, calibrate, and validate hydrological models using various performance indicators
- Run future climate impact simulations using bias-corrected future climate scenarios and compare future outputs with the historical baseline
- Analyze future climate impacts on flood magnitude and frequency in the EN sub-basin

4. Qualification requirements

- Minimum bachelor's degree in meteorology, climatology, hydrology, water resources engineering, environmental science, geoinformatics, or a closely related field.
- Minimum of five (5) years of experience after B.Sc. degree in the above fields of study.
- Having an MSc. Degree or above in the above fields is an advantage.
- Have practical experience and strong academic exposure in climate/weather data processing, hydrometeorological analysis, GIS, remote sensing, or hydrological modeling.
- Demonstrate familiarity with observed, satellite-based, reanalysis, and gridded datasets
- Have a good understanding of Global and Regional Numerical Weather Prediction models and their application in flood forecasting
- Demonstrate understanding of climate change impact analysis on floods, including use of climate projection datasets and models

- Demonstrate familiarity with climate and weather datasets, including station observations, satellite rainfall estimates, reanalysis products, and numerical weather prediction outputs.
- Possess skills in data analysis and visualization using tools such as Excel, Python, R, ArcGIS, QGIS, CDO, NCO, Panoply, Google Earth Engine and similar software.
- Proven knowledge of hydrological modeling concepts, rainfall-runoff processes, basin water balance, flood forecasting, and climate risk assessment.
- Capability of working in multi-disciplinary and multi-cultural teams, and under tight deadlines.
- Must be under thirty-five (35) years of age at the time of application.
- Only citizens of one of the Eastern Nile sub-basin countries **can apply**.
- Female candidates are **highly encouraged** to apply.
- Previous ENTRO interns **are not allowed to apply!**

5. Implementation Arrangements

- The deadline for the application is ***02 October 2026, time: 12:00 PM*** (EAT).
- The assignment is a three-month assignment, extending from 01 November 2026 to 31 January 2027
- ENTRO will cover the cost of the travel expenses (ticket, visa, etc.) as well as the monthly stipend.
- The Intern shall be stationed at ENTRO, Addis Ababa, Ethiopia
- ENTRO shall also provide:
 - Adequate working facilities and support in the gathering of data, access to relevant information and authorities,
 - Adequate office space and support facilities (such as the internet),
 - Tailor-made capacity-building and training programs related to the subject matter.
- Any study report or other materials, graphics, software, or otherwise, prepared by the Intern during the internship period shall belong to and remain the property of ENTRO. The Intern may retain a copy of such documents and software.

6. Application

Interested applicants must submit their CVs together with the cover letter and motivation letter alongside a copy of the passport's biometric page. Applications should be submitted via email to the following addresses: entrovacancy@nilebasin.org, zanbesa@nilebasin.org, and copy to gabdi@nilebasin.org, with the subject line "Application for 4th Batch Internship RCRP"

PLEASE make sure **to include all** email addresses above during the application:

Due to the anticipated large number of applications, only successful candidates who meet the required experience and qualifications for this position will be contacted.