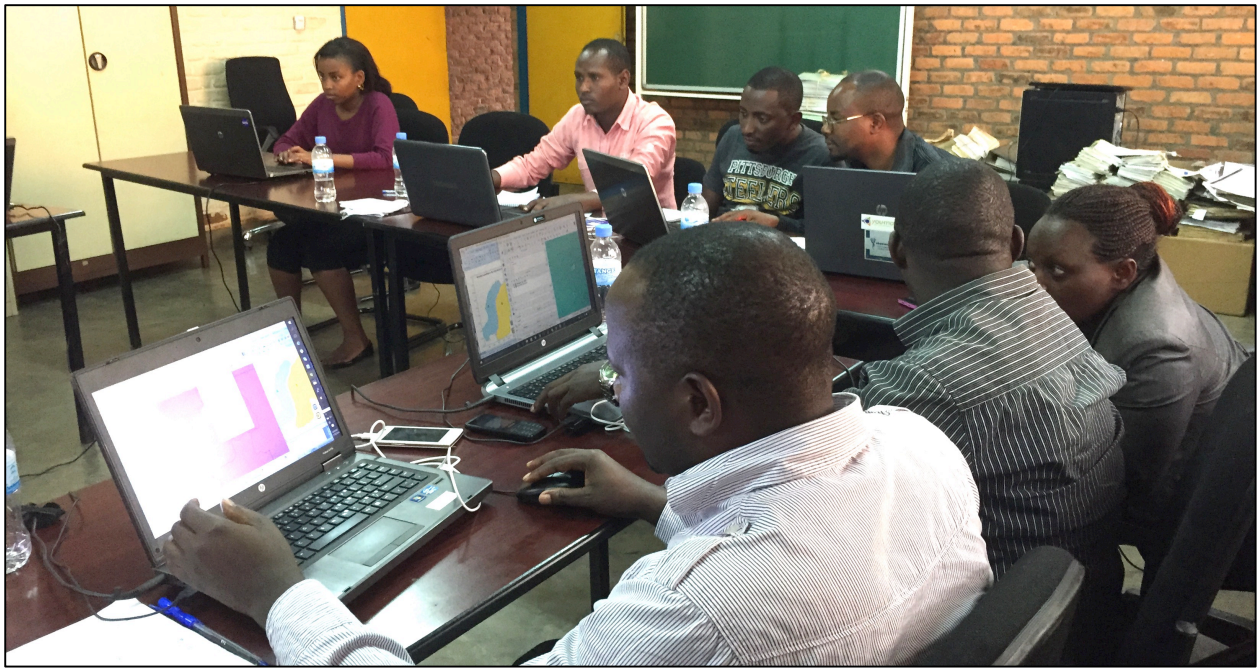
Workshop report: ENACTS Data Library, Maproom, and GIS training at Rwanda Meteorological Agency

July 2016

John del Corral



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Kigali, Rwanda, July 2016

Workshop Report

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

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Abstract

This report describes a training visit to the Rwanda Meteorological Agency (Meteo Rwanda), 21-29 July 2016, aimed at increasing staff technical capacity to understand and the ENACTS 10-day, monthly, and newly created daily data. Objectives were to: (a) train Meteo Rwanda staff on ENACTS data, the Data Library software, Maprooms, and Geographic Information Systems (GIS); (b) install the ENACTS Daily rainfall dataset and Maproom; create a backup of the Data Library system, and install a second Data Library with Maprooms for internal Meteo access. The report concludes with a set of recommendations to continue to strengthen ENACTS at Meteo Rwanda, based on interactions during the training visit.

Keywords

ENACTS; Data Library; Maprooms; GIS; capacity building

About the authors

John del Coral is a Senior Staff Associate at the International Research Institute for Climate and Society (IRI), at Columbia University, focused on Data Library software, database management, GIS and semantic technology. Contact: jdcorral@iri.columbia.edu

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Contents

Acronyms

ENACTS	Enhancing National Climate Services
GIS	Geographic Information Systems
IRI	International Research Institute for Climate and Society
RMA	Rwanda Meteorological Agency

Introduction

This report describes a training visit by John del Corral to the Rwanda Meteorological Agency (Meteo Rwanda), 21-29 July 2016. The main objectives were to: (a) train Meteo Rwanda staff on ENACTS data, the Data Library software, Maprooms, and Geographic Information Systems (GIS); (b) install the ENACTS Daily rainfall dataset and Maproom. A secondary objective was to create a backup of the Data Library system for emergency recovery situations at Meteo Rwanda, and install a second Data Library with Maprooms for internal Meteo access. This will allow Meteo Rwanda staff to download data to their desktop or laptop, and to fulfil data requests by other ministries. Twelve individuals were involved in the training. Two were affiliated with CIAT- Rwanda, and 10 were representatives from Meteo Rwanda.

Program Description

ENACTS Data (21-22 July)

The workshop began by with an exhaustive overview of the ENACTS daily, 10-day, and monthly rainfall and the 10-day and monthly temperature data for Rwanda. For this we used the Meteo Rwanda Data Library online mapping and data system. Next we discussed the concepts of climatologies and anomalies and how to calculate them using the ENACTS data. We demonstrated how to choose spatial and temporal domains in the data. Some simple statistical analyses were presented using the Data Library built-in tools. At the end of the 2 days, we examined the process of updating the ENACTS 10-day rainfall monitoring data product in the Data Library and Climate Monitoring maproom.

Maprooms (25-28 July)

This part of the workshop was devoted to understanding the ENACTS online maprooms and creating new datasets in the Meteo Rwanda Data Library. The maprooms are divided into 2 main sections. There is a Climate section and a Malaria Historical Analysis section. First we explored the Climate Analysis maprooms for daily, 10-day, and monthly ENACTS rainfall and temperature data. These maprooms present 30-year climatologies for rainfall and temperature. By selecting a point or administrative boundary on the map, one can also view anomalies for rainfall from 1981-2014 and

anomalies for temperature from 1961-2014. It was important for the participants to become familiar with the various maproom controls for zooming in, selecting a point or administrative boundary for analysis, and for saving the map or time series in an acceptable graphics format. The Climate Monitoring maproom was reviewed to show the participants how to look at the most recent rainfall (10-day, month, and season) and compare that to the climatology. We discussed the usefulness of the ENACTS rainfall monitoring product for the agriculture and health sectors. In the Climate Forecast maprooms we examined the most recent seasonal forecast for Rwanda and the probabilities of the influence of the ENSO and Indian Ocean Dipole indices on the climate of Rwanda. In the Malaria Historical Analysis maprooms we looked at the Seasonal Climate Suitability for Malaria transmission in Rwanda. We also reviewed the 32-year 12-month Weighted Anomaly Standardization Precipitation index relative to a user-selected baseline period for different administrative boundaries in Rwanda. We discussed the usefulness of the results to determine whether climate may have played a role in the success or failure of a disease prevention campaign.

We spent one day working with the open source Quantum GIS software to digitize seasonal forecasts for Rwanda. Then we demonstrated how to add GIS features to the Data Library and the maprooms. It was important for the participants to understand this so that they could continue to update their Data Library when new seasonal forecast are made and when administrative boundaries change.

Data Library system and backups (29 July)

The last day of the workshop was devoted to Data Library and Maproom maintenance. We examined the critical software services needed for the Data Library system. We demonstrated how to make backups of the computer system and the data. We created and tested a duplicate Data Library and Maproom system on a separate computer for Meteo Rwanda internal access.

Conclusion

Meteo Rwanda has very good infrastructure for supporting the Data Library and ENACTS maprooms installed there. Online reliability is excellent. This makes Meteo Rwanda an excellent choice for supporting Climate Services for Rwanda.

Interactions during the training visit suggest several recommendations. First,

Meteo Rwanda is urged to actively update the ENACTS dekad rainfall for Climate Monitoring. It is currently 2.5 months behind the current dekad. It should be updated every 10 days. One problem is that the merging software for the ENACTS monitoring product is only installed on one computer. This prevents updating by multiple people (in case the designated person is not available, or too busy). Second, add the newly added Sector (sub-division of Districts) boundaries as selection choices in the Rwanda maproom. Third, I recommend that 4-5 top people from the training class of 12 receive follow-up training and assume active roles in supporting the Rwanda Data Library and Maproom. Fourth, review GeoClim software for Africa, and list strengths and weaknesses compared with the Rwanda Data Library and Maprooms. Fifth, install the Data Library Authorization service on the external access Data Library, so that users in other ministries and offices can have access to downloading the data. Finally, review the strengths and weaknesses of the Daily ENACTS rainfall data by comparing with station data. As of the training visit, Meteo Rwanda was not yet ready to approve use of the Daily ENACTS rainfall data.

Appendix 1. Participant List

Participant	Title and Organization	Gender
Jean Marie Niyitegeka	Forecasting Officer, Rwanda Met	Male
Joseph Sebazga	Forecasting Officer, Rwanda Met	Male
John Ntaganda	Director General, Rwanda Met	Male
Prosper Ayabagabo	Forecasting Officer, Rwanda Met	Male
Joseph Hazabintwari	Observations Officer, Rwanda Met	Male
Blandine Mukamanea	Data Processing Officer, Rwanda Met	Female
Floribert Vuguziga	Forecasting Officer, Rwanda Met	Male
Clarisse Mukazarukundo	Observation Officer, Rwanda Met	Female
Amos Uwizeye	Data Quality Control, Rwanda Met	Male
Jean Paul Kalisa	Observation Officer, Rwanda Met	Male
Joseph Ndakize	Forecasting Officer, Rwanda Met	Male
Francois Nsengiyumva	Graphics Design Officer, Rwanda Met	Male
Desire Kagabo	Director, CIAT - Rwanda	Male
Gloriose Nsengiyumva	CIAT - Rwanda	Female

Appendix 2. Training Program

21-22 July
ENACTS rainfall and temperature data, including daily rainfall; Updating the ENACTS monitoring dekad data; Analyses using ENACTS data Climatologies and Anomalies
25-28 July
ENACTS Maprooms, including Daily rainfall maproom; Digitizing Rwanda Seasonal forecasts with open source QGIS; Adding new GIS features (like 3rd order administrative boundaries); Exercises using ENACTS maprooms
29 July
Data Library system and backups; Duplicate system on a separate PC for Meteo Rwanda internal access.