# The Critical Role of Satellite Rainfall Estimates for Enhancing National Climate Services Across Africa

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# Climate Services

**The provision of one or more climate products or advice in such a way as to assist decision-making by individuals or organizations (WMO/GFCS).**

- **Climate data are critical inputs for delivering effective climate services.**

- **Challenges regarding the availability, access and use of climate data in Africa**

# Outline

I. Challenges and Opportunities

II. The ENACTS (Enhancing National Climate Services) Approach

III. Value of Satellite Rainfall Estimates

IV. Summary of Major Outputs

V. Contribution to Satellite Rainfall Estimation

# I. Major Challenges

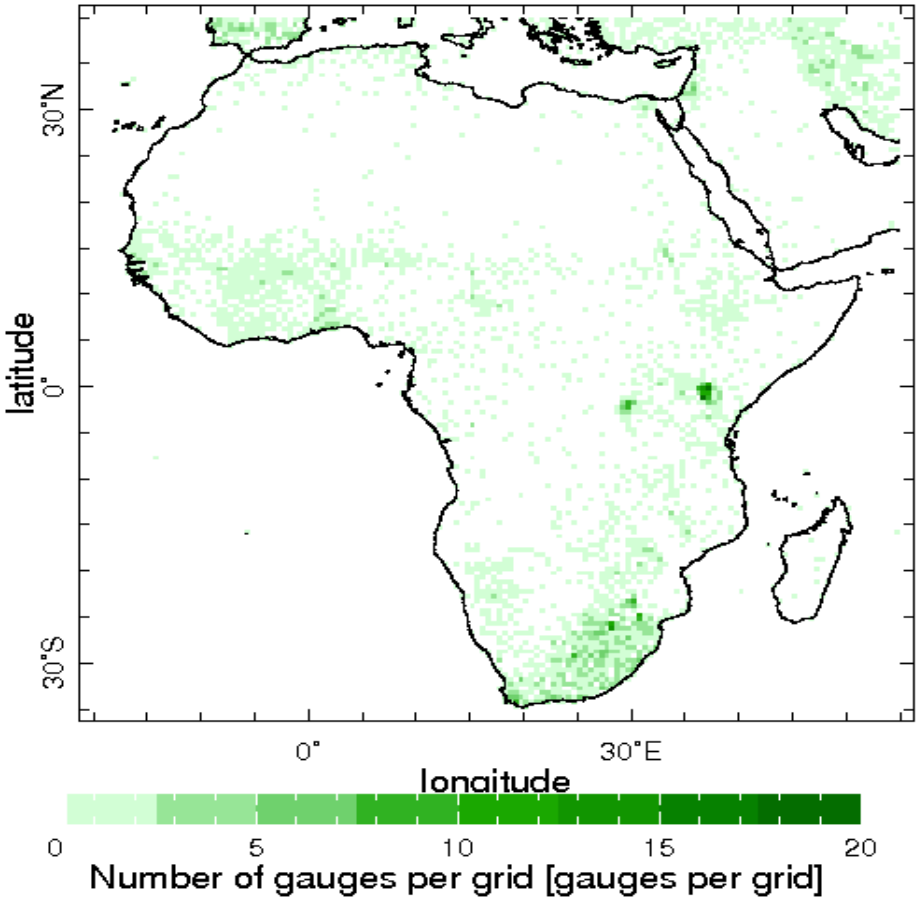
- Number of weather stations not adequate over many parts  Africa
- Most stations are located along main roads

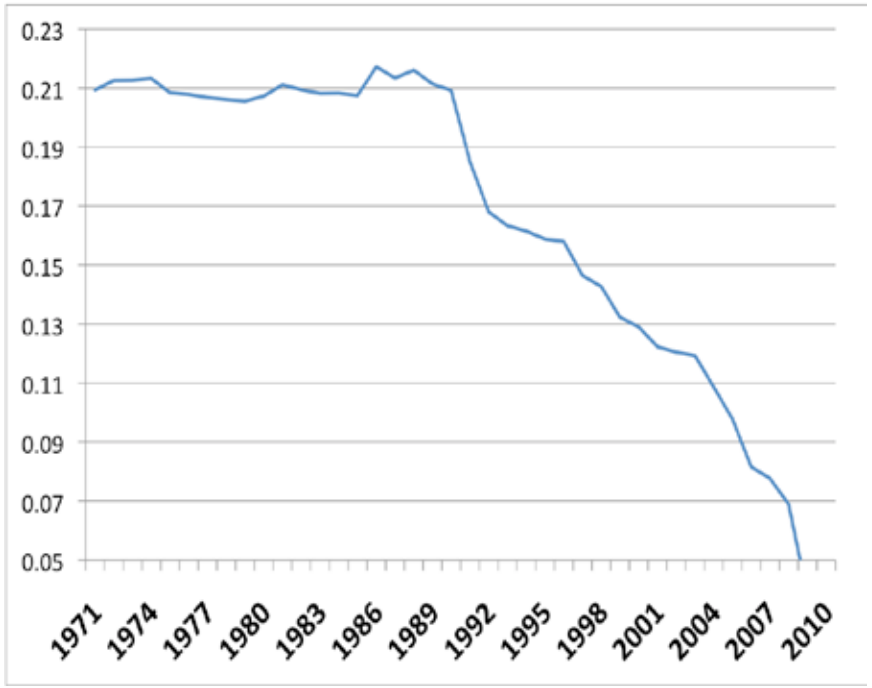
  è Limited availability climate information and services to the rural community

- Serious gaps in observations (missing data)
- Questionable data quality
- Limited access and use of the available data

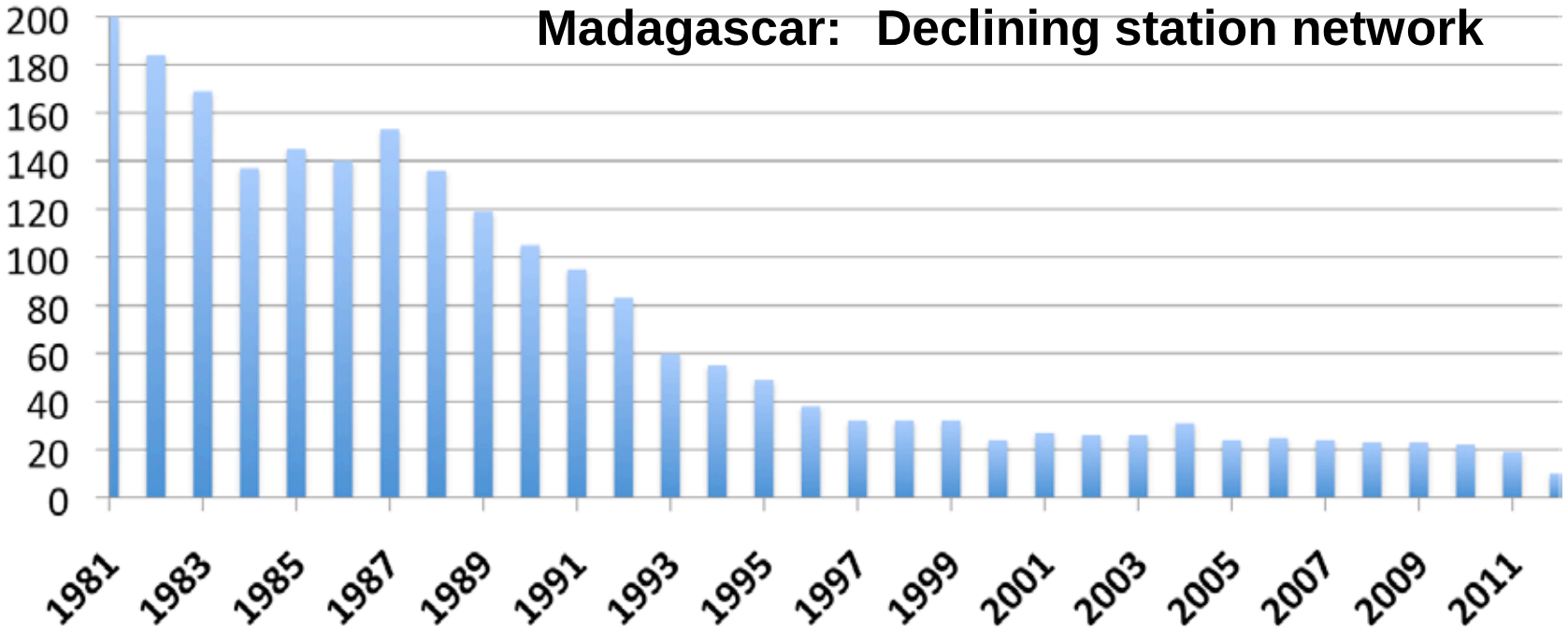
# Sparse and Declining Observations Network

## Average(1971-2010) number of stations in a 50kX50km grid box used for the GPCC gridded rainfall dataset



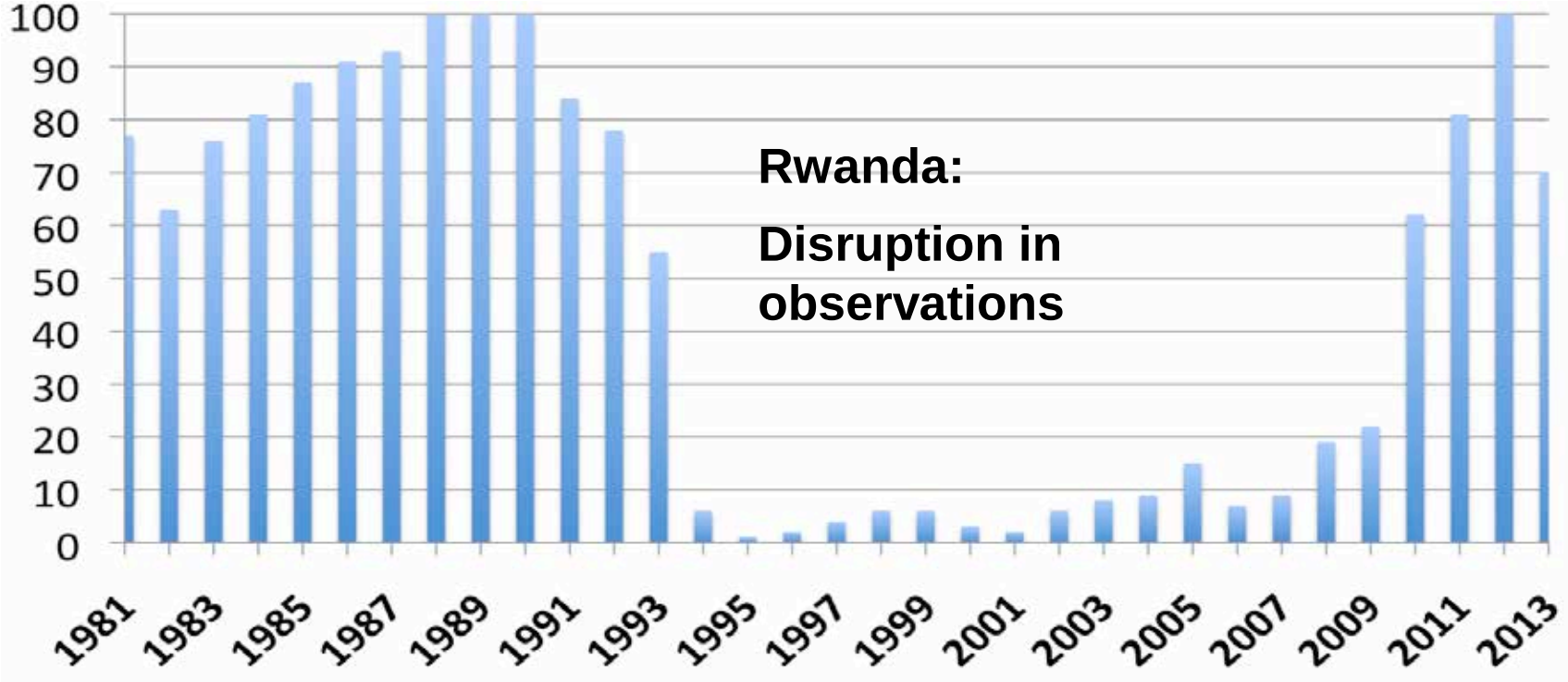



# Challenges at National levels




**Average number of stations reporting each year**

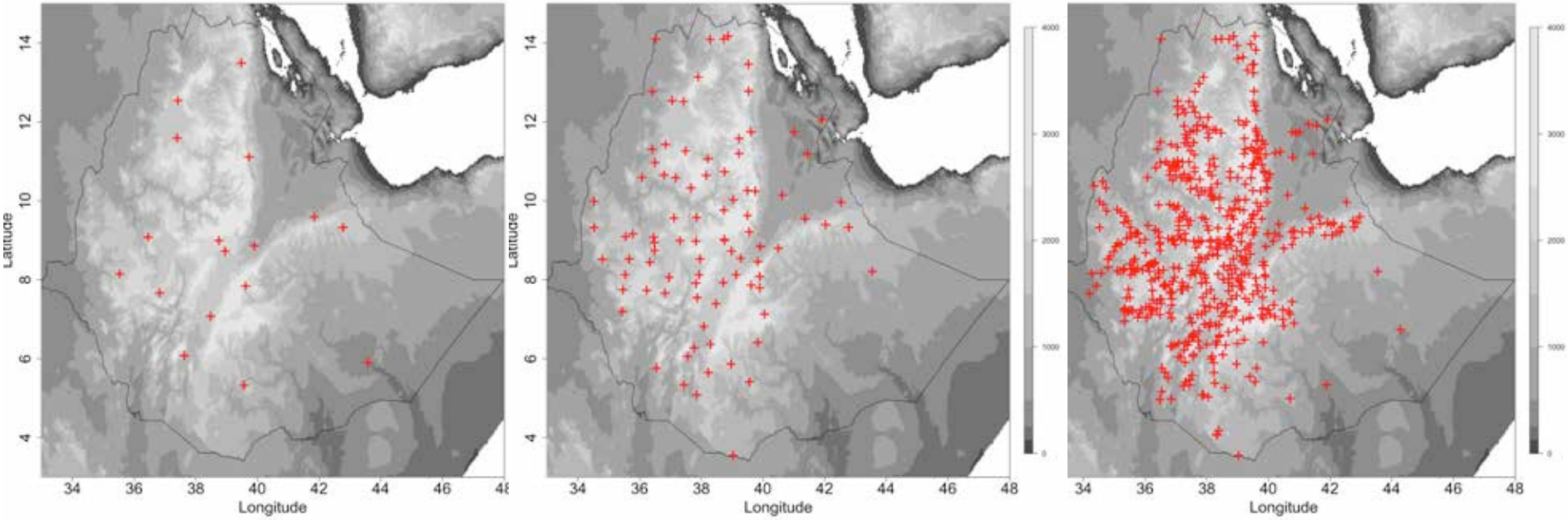
# Challenges at National levels




**Average number of stations reporting each year**

# Opportunities

**However, most NMS have much more data than what is accessible outside the country/NMHS**




**Synoptic/GTS stations** **Operational stations** **ENACTS stations**

# II. The ENACTS Approach

- **Strives to simultaneously improve availability, access and use of climate information.**

- **Works with NMHS to quality-control all available station data and combine them with satellite and reanalysis products.**

- **The main focus of ENACTS is creation of reliable climate information for local decision-making.**

# The Three Pillars of ENACTS

## E N A C T S

### Improve Availability

- **Build capacity of NMHS**
- **Generate climate data time series**
- **Improve seasonal forecast**

### Enhance Access

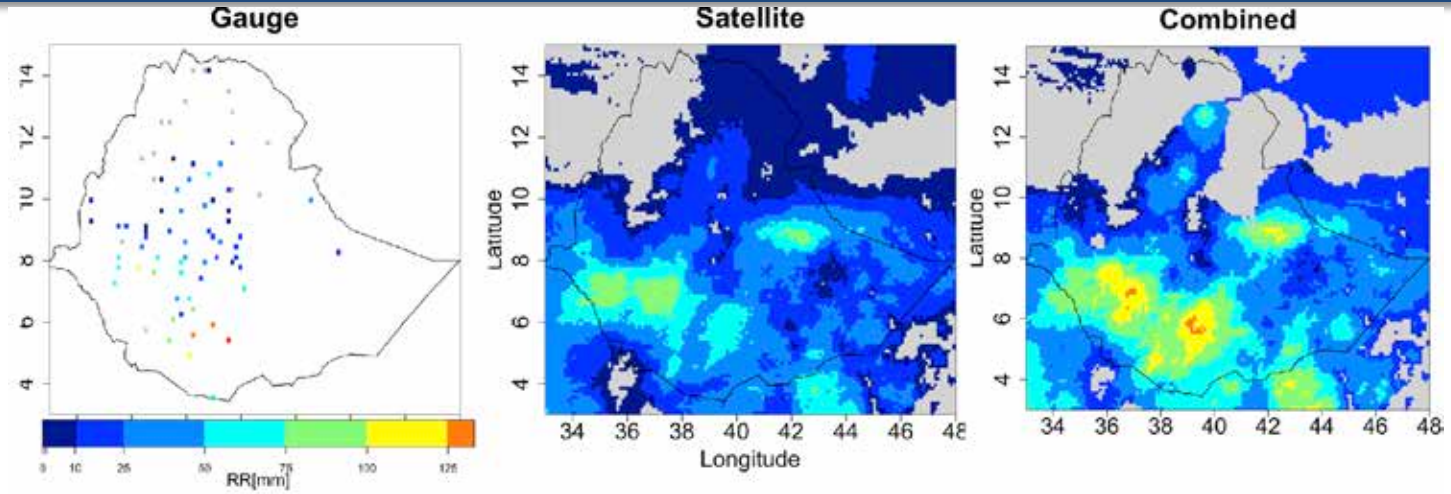
- **Develop online tools for data analysis and visualization**
- **Create mechanisms for data sharing**

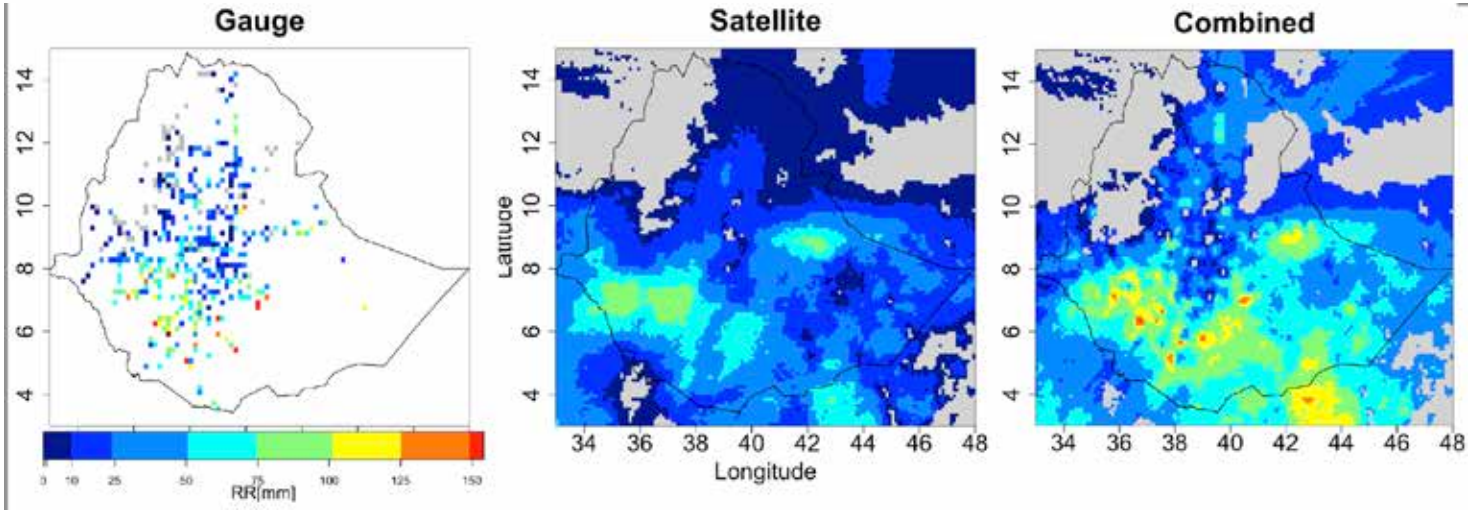
### Promote Use

***Engage users:***

- ***Raise* awareness**
- **Train**
- **Involve users in product development**

# ENACTS: Improving Availability




**Over 30-yrs of dekadal rainfall time series at 4/5km resolutions**

# ENACTS: Improving Access

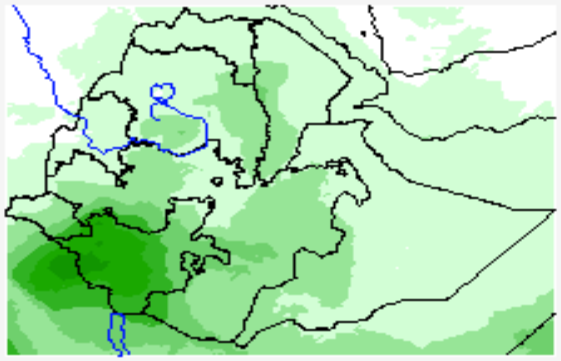
**The Climate Analysis and Applications Maproom**

Climate Analysis | Climate Monitoring | Climate Forecast

## Climate Analysis

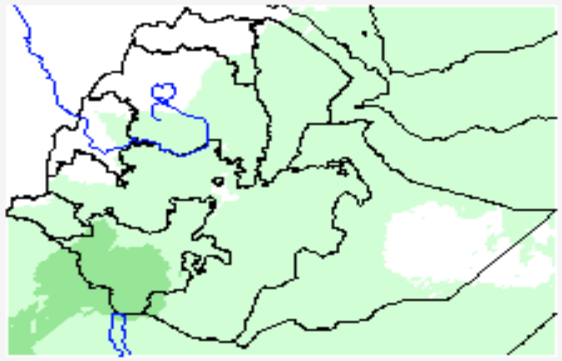
### Monthly Climate Analysis

Rainfall and temperature time series (1983-2010) reconstructed from station observations and remote sensing proxies. This interface allows users to view rainfall, maximum and minimum temperature climatologies and anomalies.



### Dekad Climate Analysis

Rainfall and temperature time series (1983-2010) reconstructed from station observations and remote sensing proxies. This interface allows users to view rainfall, maximum and minimum temperature climatologies and anomalies.



# ENACTS: Improving Use

## Awareness raising

## Training

## Involving users in product generation

# III. The Value of Satellite Rainfall Estimates

## Requirements for satellite rainfall estimates

-Long and consistent time series

-High temporal and spatial resolutions

è IR-only products used

## Selected satellite rainfall products

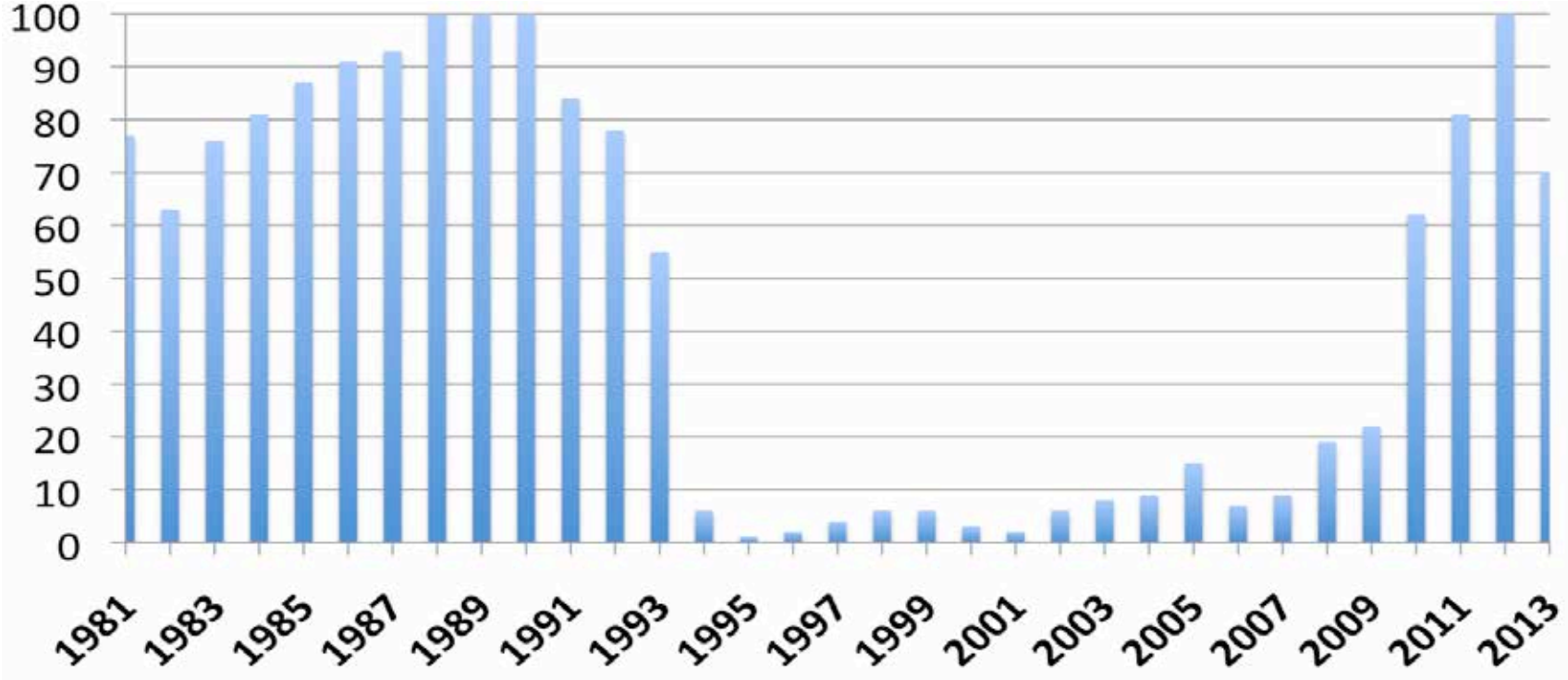
-TAMSAT: Dekdal, 4km, 1983-presnt, Africa

-ARC: Daily, 10km, 1983-presnte, Africa

-CHIRP: pentad, 5km, 1981-present, Global

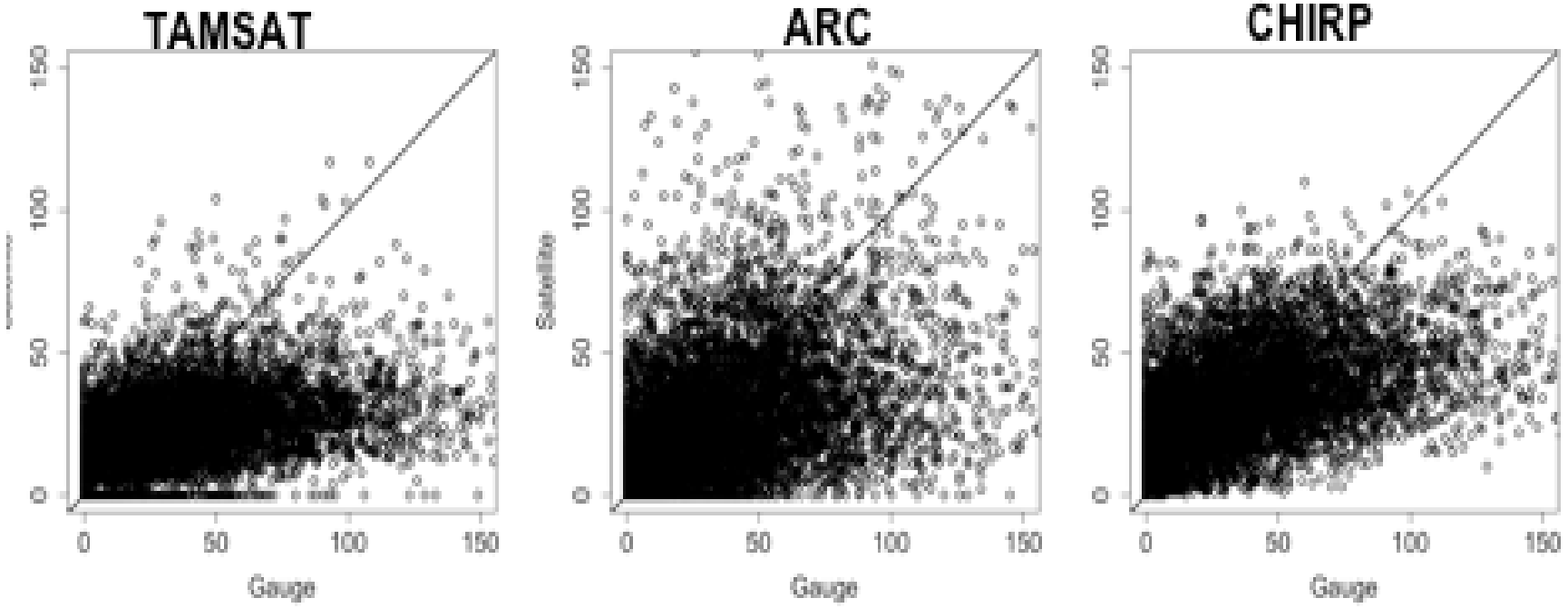
# The Value of Satellite Rainfall Estimates

## The Case of Rwanda: Gaps in Observations



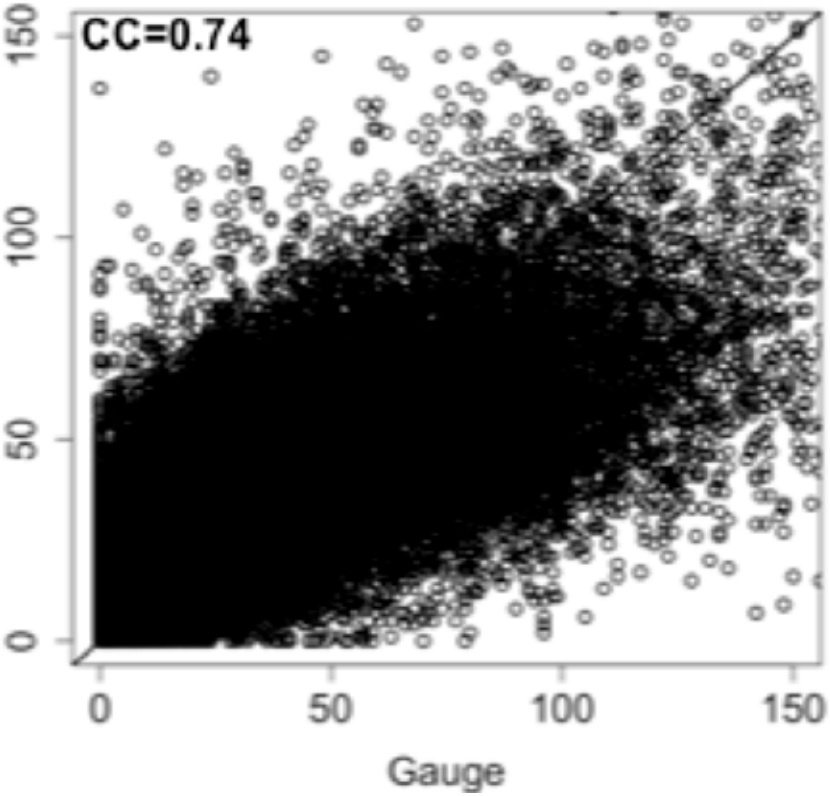
# The Value of Satellite Rainfall Estimates

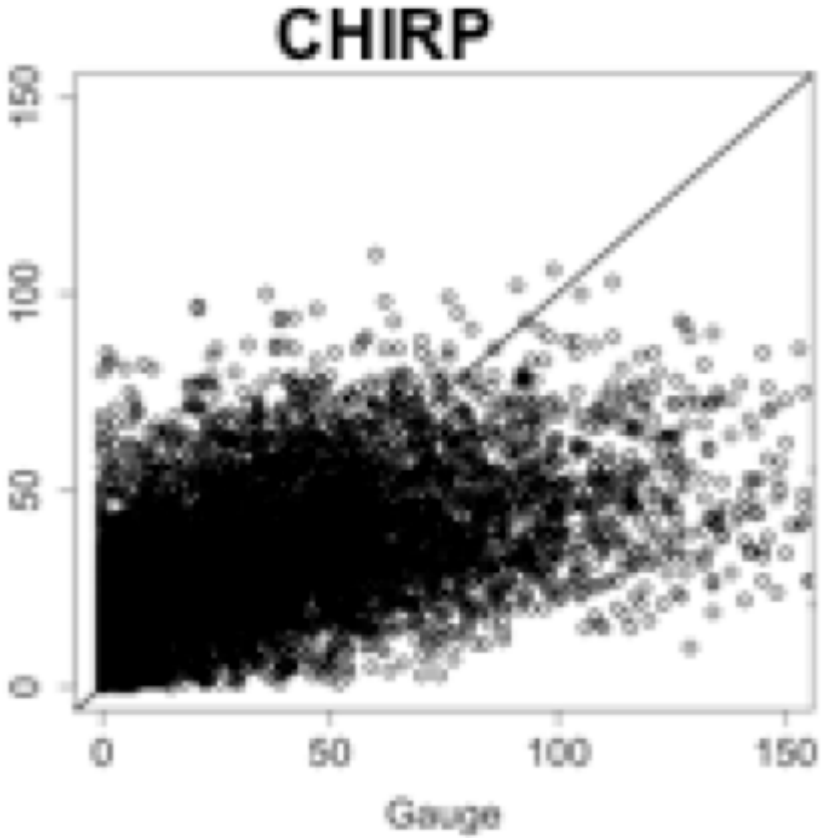
## The Case of Rwanda: Satellite data not good



# The Value of Satellite Rainfall Estimates

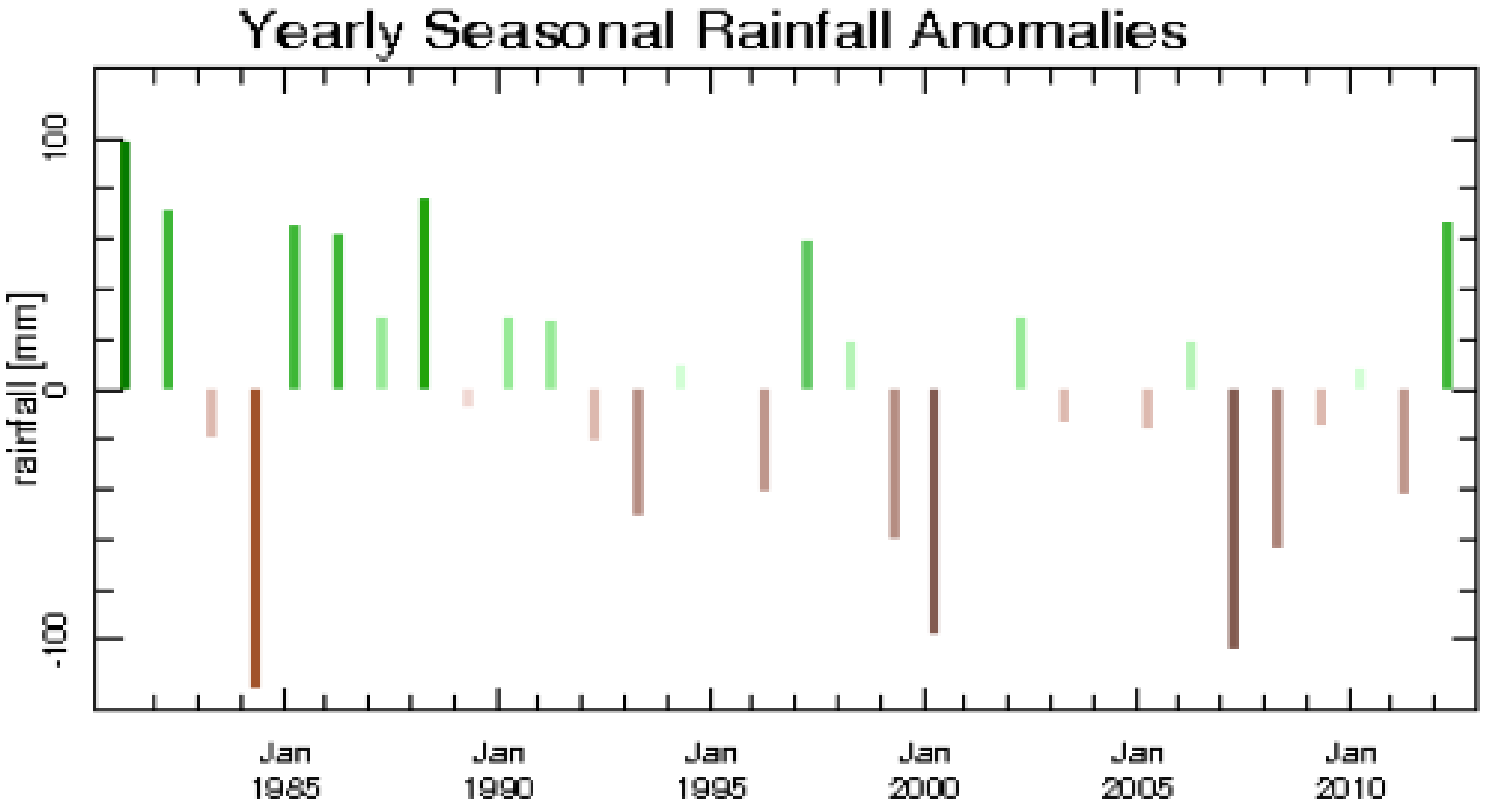
## The Case of Rwanda: Combined data



# The Value of Satellite Rainfall Estimates

## The Case of Rwanda: Use of reconstructed data



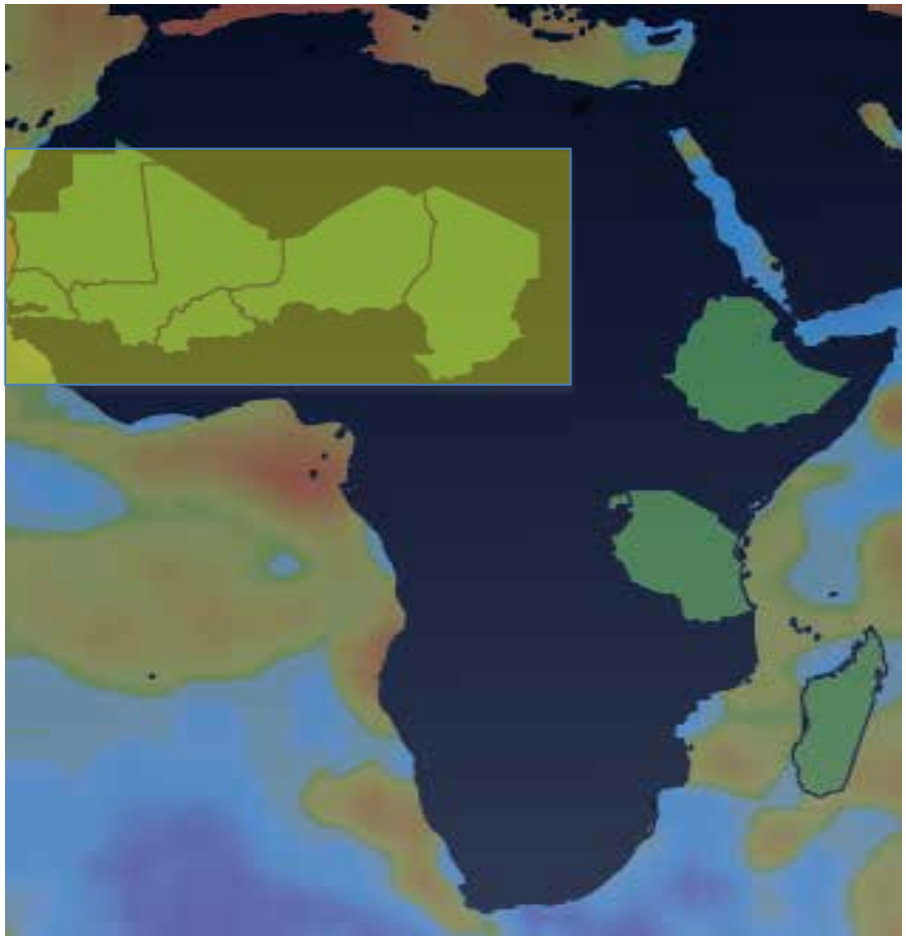
# IV. Summary of Major Outputs

- **Over 30-years of climate data for every 4km/5km grid across each country:**
  - **Now data available where there are no stations**
- **Installation of the IRI Data Library at NMS**
  - **A powerful tool for generating climate information**
- **Unprecedented online access to information products:**
  - **Satisfies the needs of many users**
  - **Overcomes (partly) the challenges of data access**
- **Built capacity at NMS and some user communities**

# ENACTS Countries

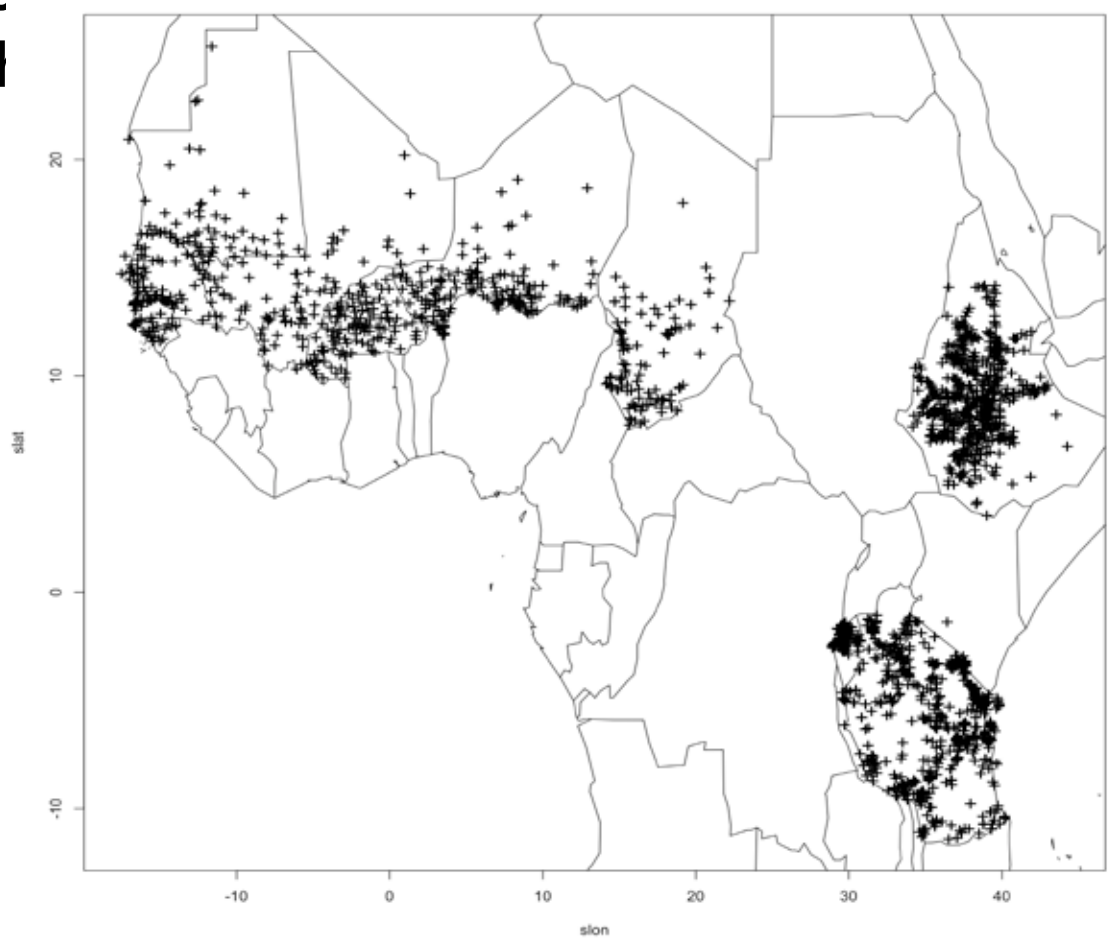
**Ethiopia**
**Tanzania**
**Madagascar**
**Rwanda**
**Gambia**
**CILSS (regional)**

**Coming Soon:**
**Mali**
**Ghana**



# V. Contribution to Satellite Rainfall Estimation

**Validation of satellite rainfall products with relatively dense station networks**



# Thank You

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