Climate Data Transformation and Potential Lesson in Water

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Outline

I. The Value Climate Data Water Resources Management

II. Challenges to Availability of Climate Data

III. The ENACTS Approach
   1. Improving Data Availability
   2. Improving Access to Climate Information
   3. Improving the Use of Climate Information

IV. Major Outputs

V. What is next?
I. Value of Climate Data

• Analysis of historical data that enables detection and attribution of climate change.
• Analysis of vulnerability to climate extremes and risk thresholds.
• Planning and managing water development schemes such as reservoirs.
• Enhancing drought and flood predictions that can support disaster risk preparedness and prevention.
II. Major Challenges

• Number of weather stations inadequate and declining

• Most stations are located along main roads

  ➔ 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
Challenges: Stations Distribution inadequate and declining

Average (2001 to 2010) number of stations per 100km X 100km grid box used by GPCC gridded rainfall product
Some Contributing Factors

Conflict or political upheaval

Average number of reporting weather stations in Rwanda during 1981 to 2013.
Main factors

Lack or declining investment in the establishment and maintenance of weather stations

Average number of stations reporting every year

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of stations</th>
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<tbody>
<tr>
<td>1971</td>
<td>400</td>
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<tr>
<td>1973</td>
<td>350</td>
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<td>1975</td>
<td>300</td>
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<td>2013</td>
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However, most NMHS have much more data than what is accessible outside the country/NMHS.
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**.
ENACTS Approach: Three pillars

**ENACTS**

**Improve Availability**
- Build capacity of NMHS
- Quality Control station data
- Combine station data with proxies
- Improve seasonal forecast

**Enhance Access**
- Install IRI Data Library
- Develop online tools for data analysis and visualization
- Create mechanisms for data sharing

**Promote Use**
*Engage users:*
- Raise awareness
- Build capacity of users to understand and use climate info
- Involve users in product development
1. Improving Availability: Data Blending
2. Improving Access: Map Rooms

Data + IRIDL =

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.
Improving Access: **Climate Analysis Tool**

Observations for **Afdera, Zone2, Afar, Ethiopia**

**Monthly Minimum Temperature Climatology**

- **5th %-ile**
- **50th %-ile**
- **95th %-ile**

<table>
<thead>
<tr>
<th>Time</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
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<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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<tbody>
<tr>
<td>20°C</td>
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Improving Access: Climate Analysis Tool

Yearly Seasonal Min Temperature Anomalies

minimum temperature

Improving Access: Climate Monitoring Tool
Improving Access: Climate Forecast Tool

Explore potential impacts of different ENSO phases
Improving Access: Climate Forecast Tool

Translates seasonal forecast from tercile to rainfall amounts
Improving Use

i. Awareness raising

ii. Training

iii. Involving users in product generation
Major Outputs

• Over 30/50-years of climate data for every 4km/5km grid across each country:
  o Now data available where there are no stations

• Installation of the IRI Data Library at NMS
  o A powerful tool for generating climate information

• Unprecedented online access to information products:
  o Satisfies the needs of many users
  o Overcomes (partly) the challenges of data access

• Built capacity at NMS and some user communities
ENACTS Countries

Ethiopia
Tanzania
Madagascar
Rwanda
Gambia
CILSS

Next:
Ghana
Mali
Zambia
Burkina(?)

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IV. What is Next?

1. Add more climate variables (RH, PET/ET, …)

2. Include seasonal prediction at national level
   • Evaluate; Improve; Implement

3. Add sector-specific Maprooms: Health, Agriculture, Water, Disaster, ..

4. Improved Forecast Presentation
What is Next: Improved presentation of seasonal forecast
Country Online Maproom

http://maproom.meteo.go.tz/maproom/
http://map.meteomadagascar.mg/maproom/
http://cradata.agrhymet.ne/maproom/
Thank You