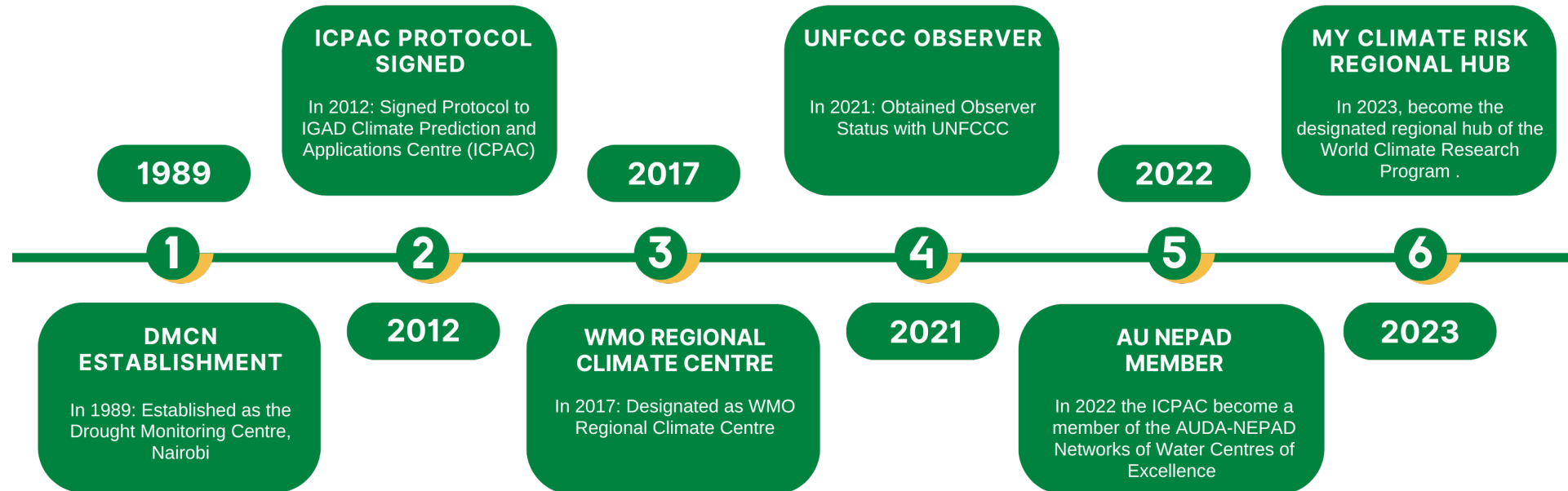




# **RARS-AFRICA: BUILDING OPERATIONAL EO DATA PIPELINES USING CSPP AND APACHE AIRFLOW**

# BRIEF ABOUT ICPAC



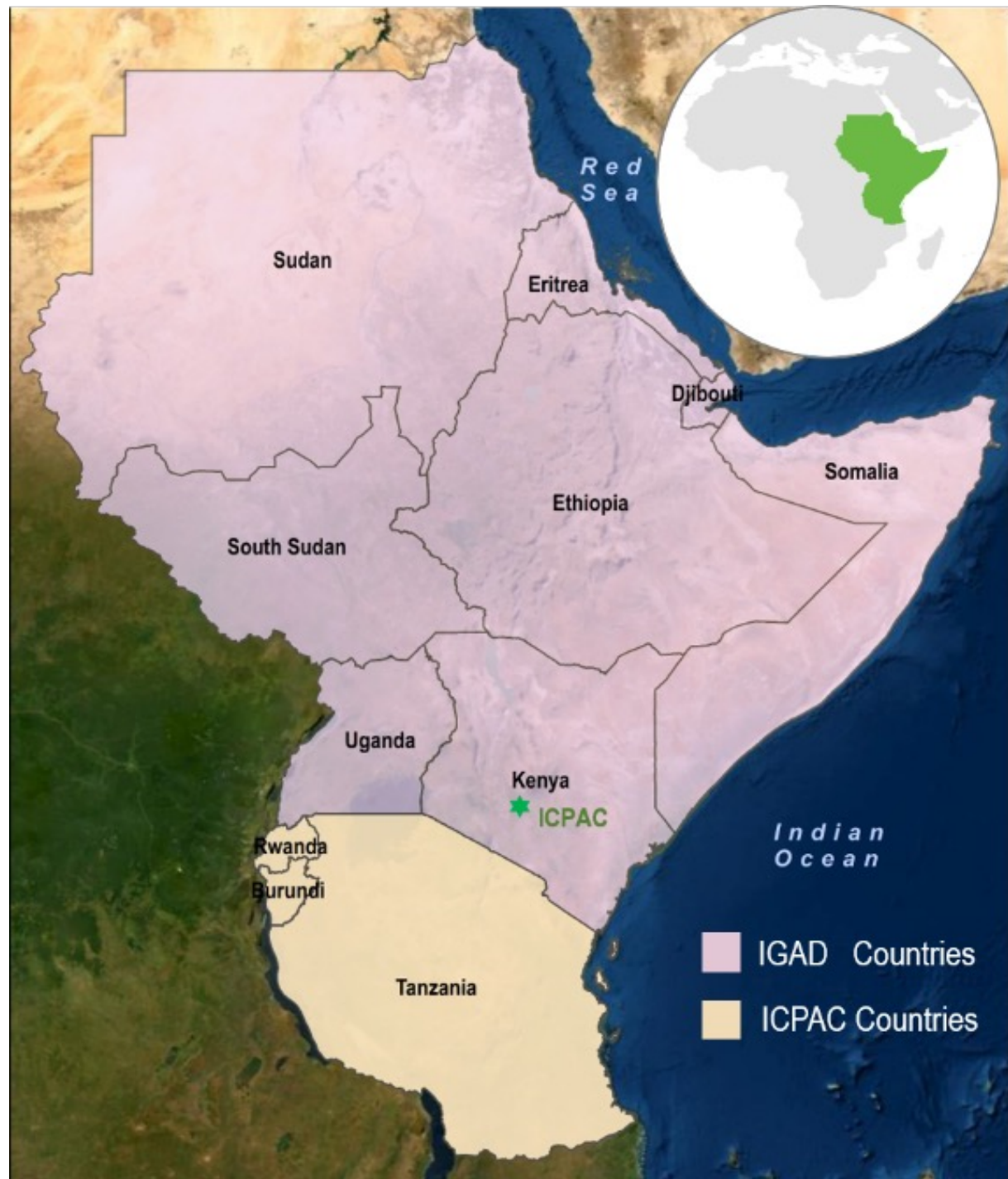
**VISION:** To be a world-class centre of excellence in climate services for sustainable development in the Greater Horn of Africa

**MISSION:** Foster climate services and knowledge to enhance community resilience for prosperity in the Greater Horn of Africa

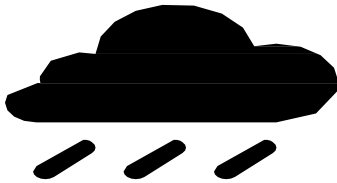
8 IGAD Member States +  
3 East African States



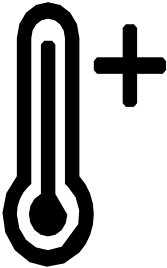
400 million people



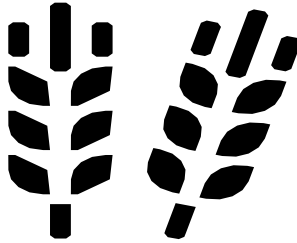
# KEY SERVICES



Climate Monitoring  
and Forecasting



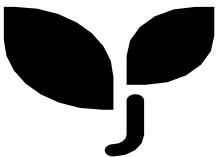
Climate Change  
Adaptation



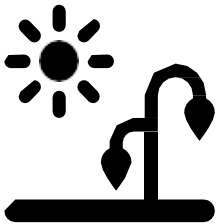
Agriculture and  
Food Security



Water Resources



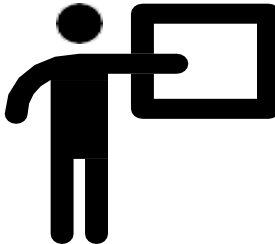
Environmental  
Monitoring



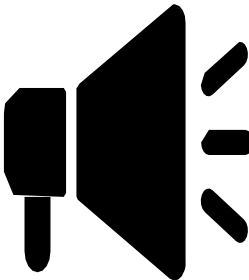
Disaster Risk  
Management



Climate Security  
Coordination Mechanism

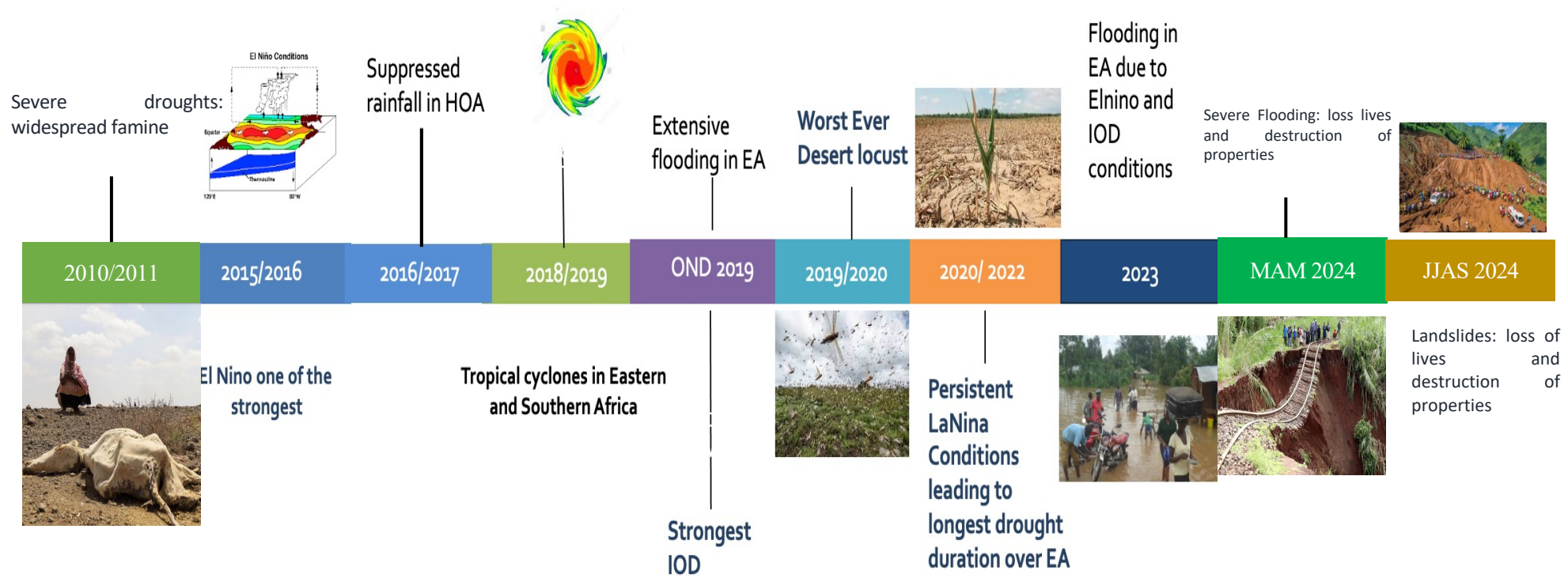


Capacity  
Development



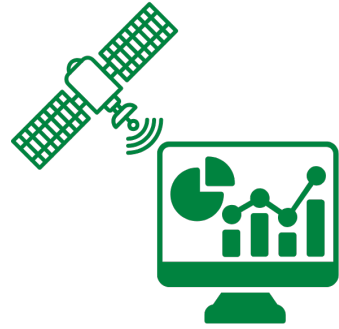
Communication  
and Co-production

# INTERPLAY OF CLIMATE RISKS IN THE HORN OF AFRICA

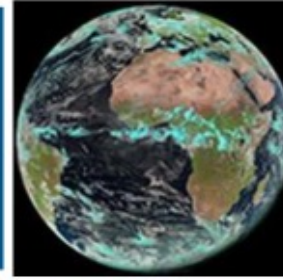


# DATA SERVICES: FROM POINT TO GRIDDED DATA SETS

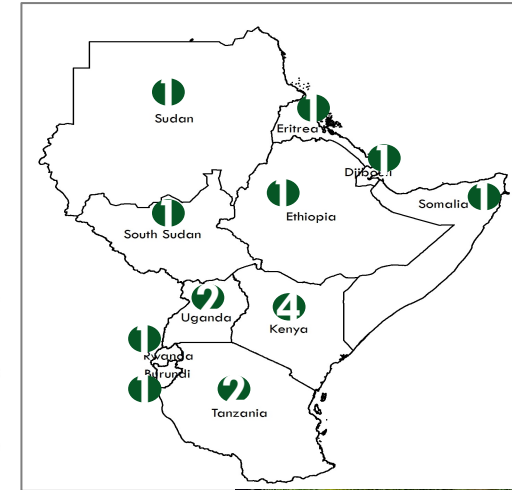
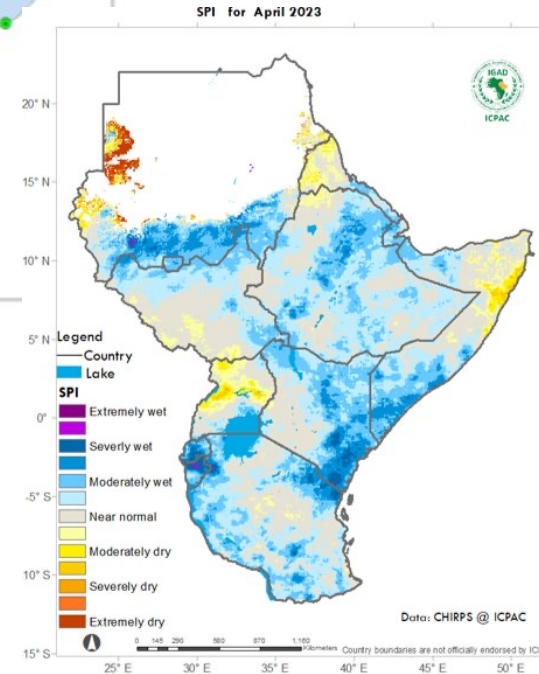
**Blended and gridded  
high resolution  
regional and national  
climate data**



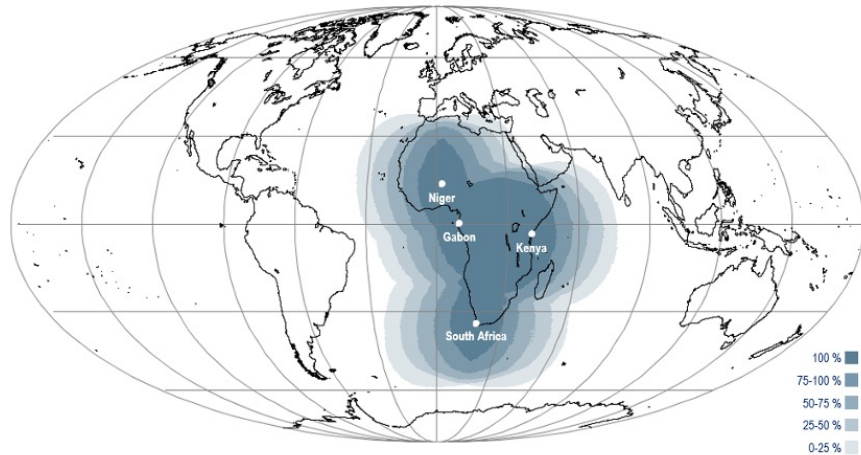
**ICPAC-satellite ground  
receiving stations**



**Receive 150 active  
weather stations  
from NMHSs**

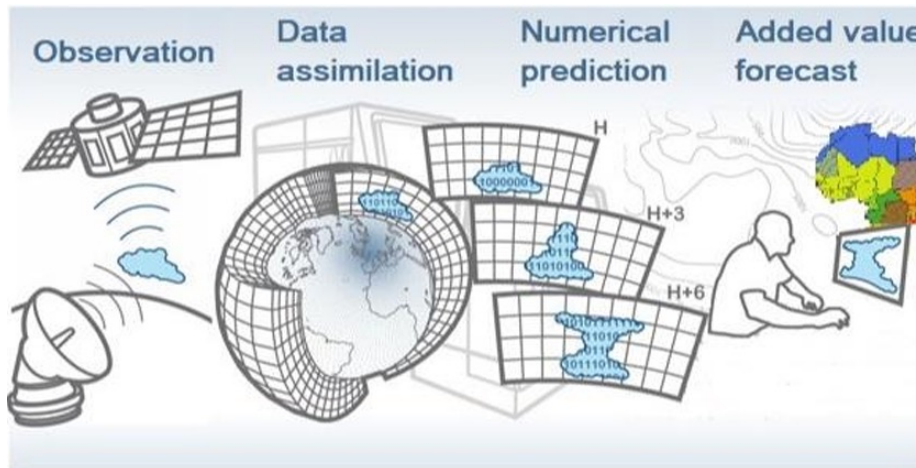


# RARS Station



## Satellite Data (Polar Orbiting) - SNPP JPSS, NOAA 20, METOP A/B/C

- Cloud Cover
- Sea Surface Temperature
- Ocean Color
- Vegetation
- Aerosols
- Fires



## Applications

- Climate Monitoring
- Natural disasters
- Vegetation monitoring
- Agriculture
- Global ice cover
- Air pollution
- Temperatures (*atmospheric, land, sea*)

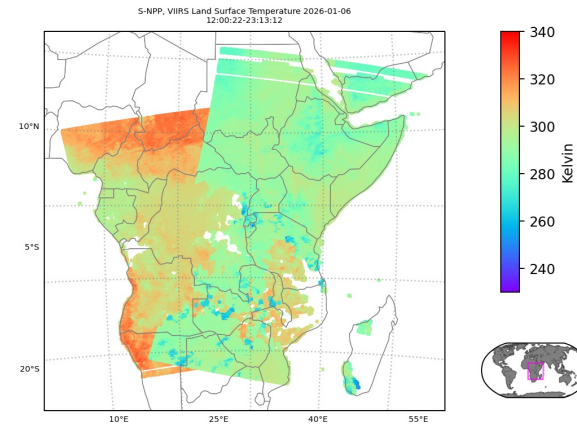
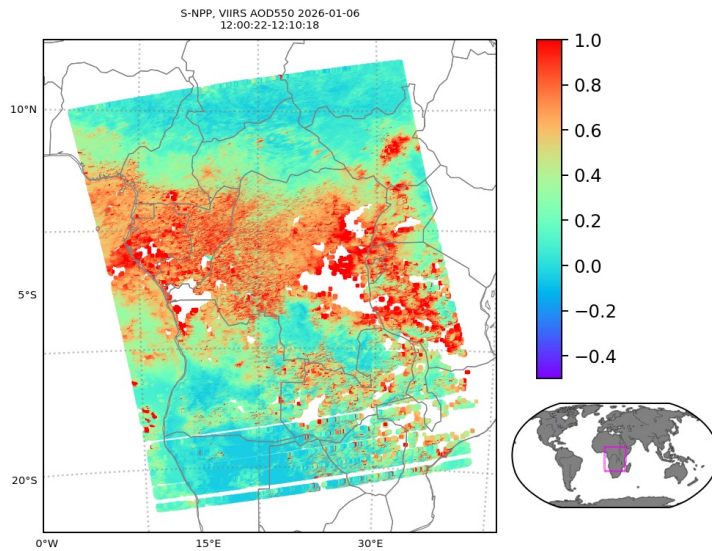
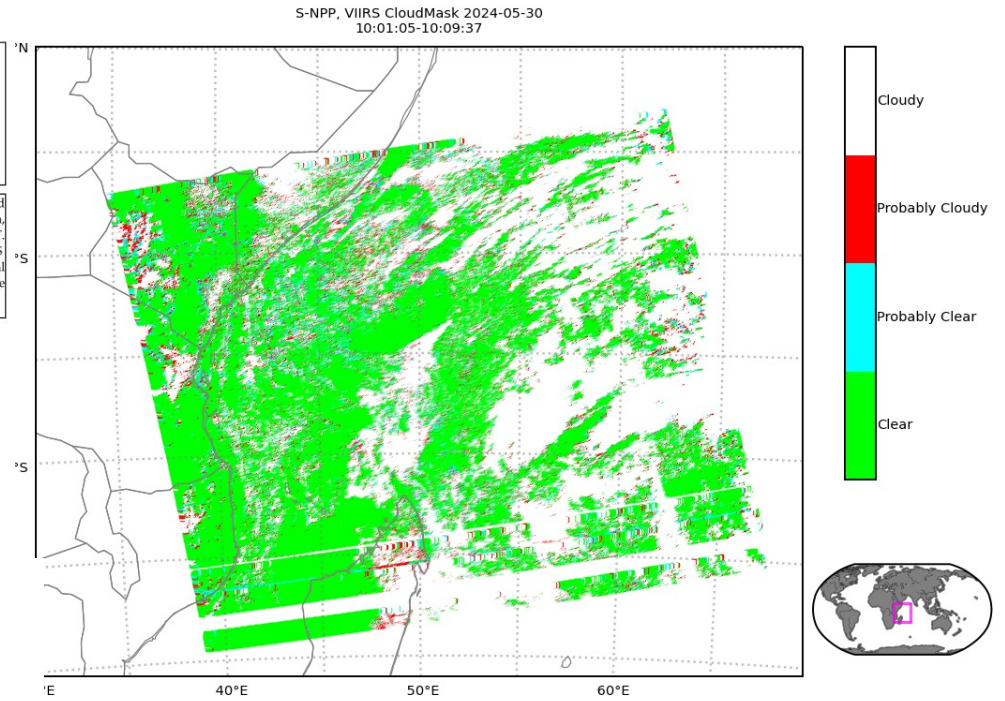
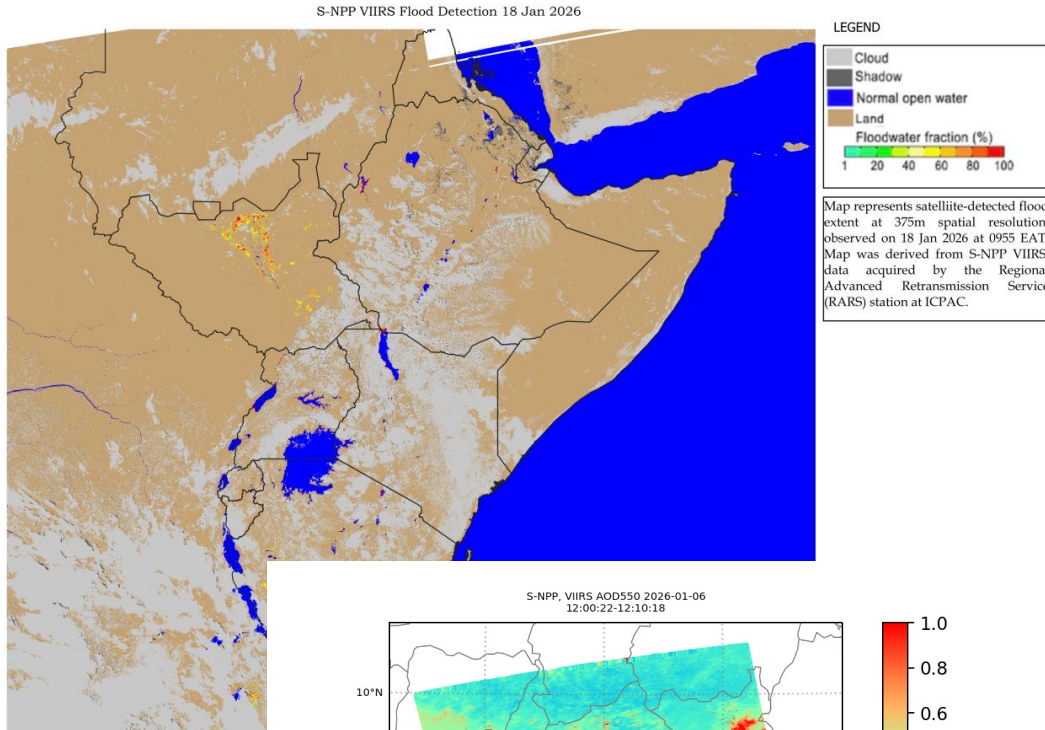
# DB DATA PROCESSING SYSTEM



## Leveraging CSPP + Apache Airflow + Pytroll

- Products
  - Active Fires
  - Flood Detection
  - Surface Reflectance
  - NDVI/EVI
  - Land Surface Temperature
  - Atmosphere EDRs
  - SST
- Airflow features
  - DAG orchestration
  - Scheduling
  - XCom / task passing of data
  - Logging / metadata

# Operational Use of DB Satellite Products



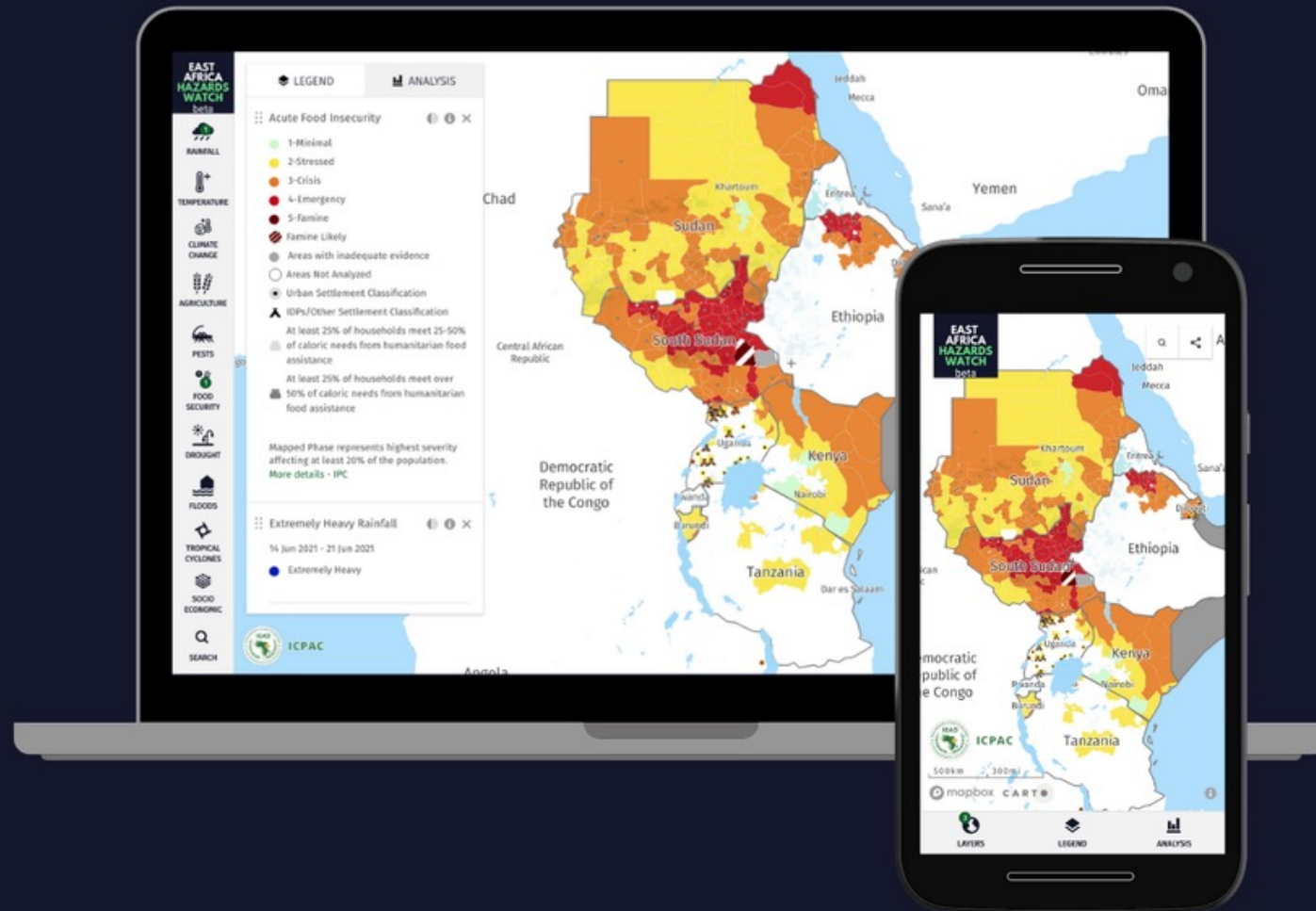
# ICPAC DISASTER OPERATIONS CENTRE

## MULTI-HAZARD EARLY WARNING SITUATION ROOM



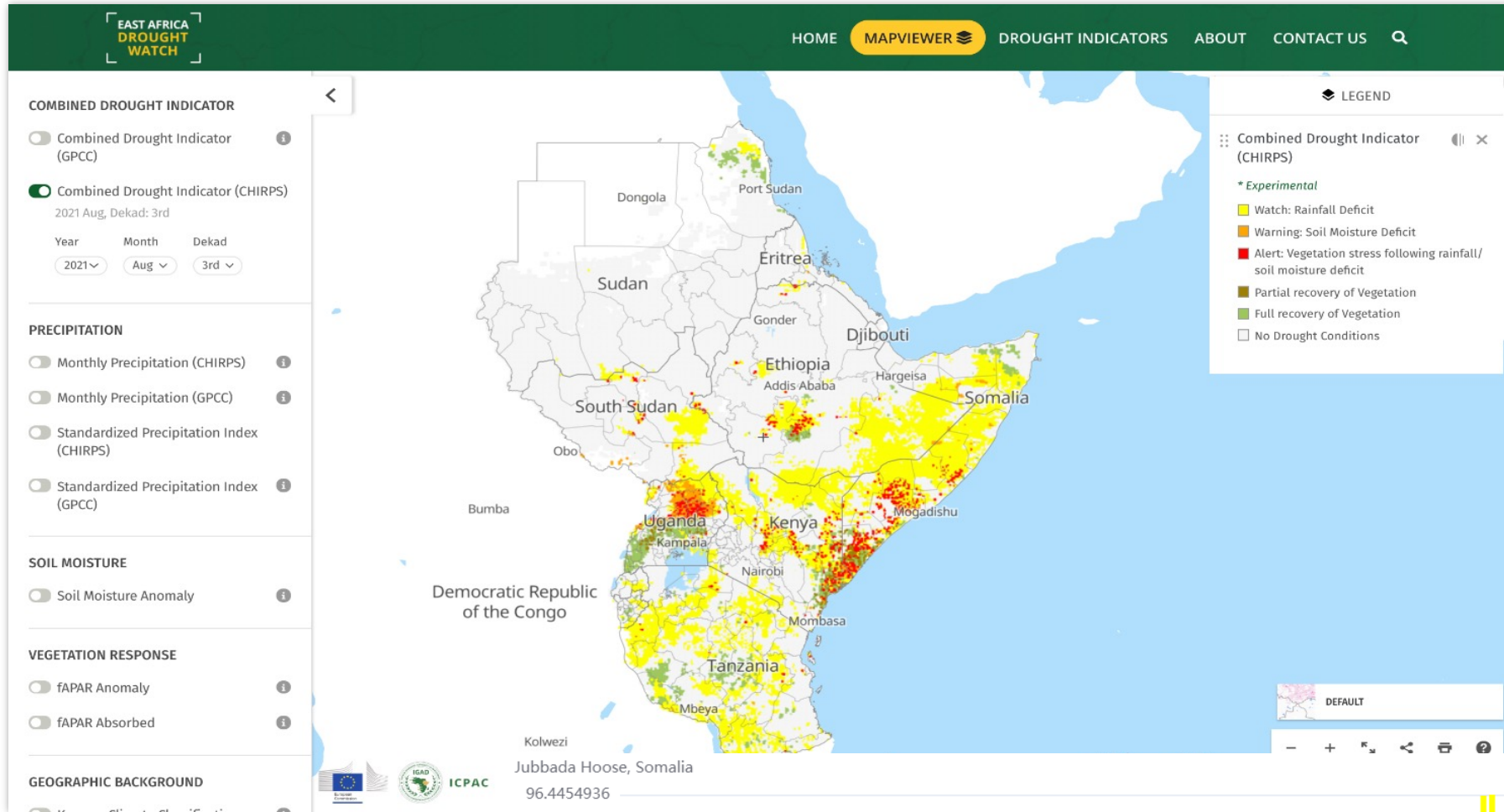
- One of the 4 situation rooms in Africa together with African Union, ECOWAS, and ACMAD
- Hazard Monitoring
- Coordinate early action
- Rapid mapping of affected areas
- Capacity building on anticipatory risk
- Support African Union Situation Room

# East Africa Hazards Watch



ICPAC

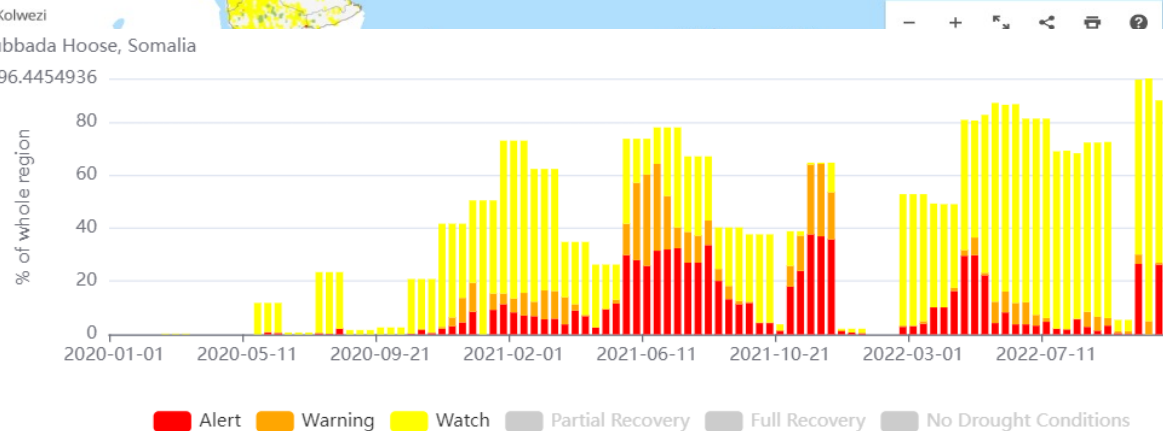
# East Africa Drought Watch



Vegetation indicators VIIRS/MODIS	Soil Moist. Indicators LISFlood model
10day fAPAR	10d SM anomaly
10d fAPAR Anomaly	

SPI (CHIRPS)	
1 month	12 month
3 month	24 month
6 month	48 month
9 month	

Combined Drought Index (CDI) -
10day CDI



# EAST AFRICA AGRICULTURE WATCH (EAAW)



Agriculture Monitoring for Eastern Africa  
Earth Observation for Productive Croplands and Rangelands



## Warning Explorer

**SETTINGS**

ASAP units

LEVEL 1 | LEVEL 2

Date: 01-10/09/2024 (D25)

Warning layer: CROP | RANGELAND

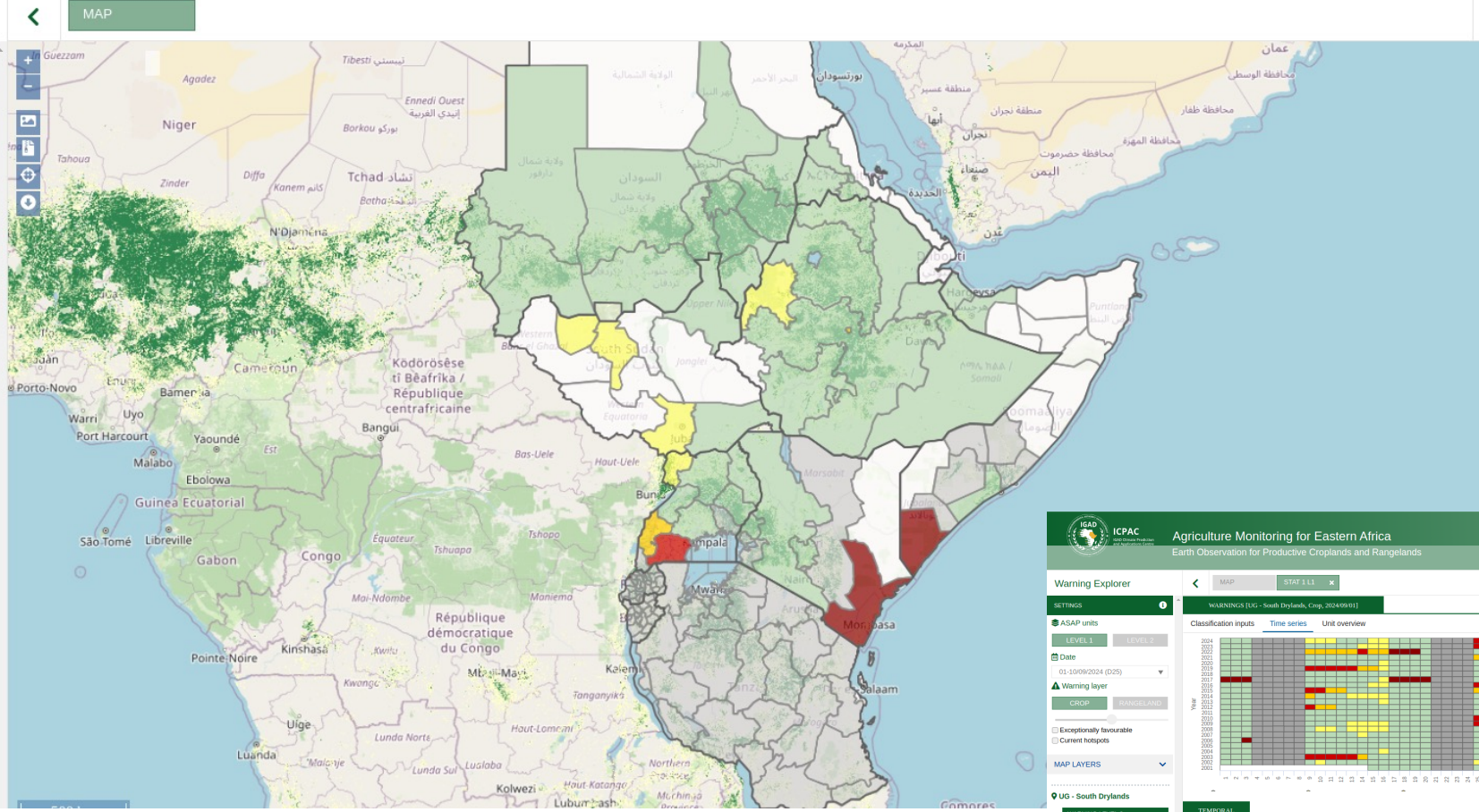
Exceptionally favourable  
Current hotspots

**MAP LAYERS**

Indicators: Select an indicator

Land cover: Crop Area

Background: Open Street Map



**LEGEND**

**Warnings**

- No crop/rangeland
- No warning
- Off season
- Water balance
- Biomass
- Water balance + biomass
- End of season biomass

**Land cover**

- 0 - 20%
- 20 - 40%
- 40 - 60%
- 60 - 80%
- 80 - 100%

**Warning Explorer**

WARNINGS (UG - South Drylands, Crop, 2024/09/01)

Classification inputs | Time series | Unit overview

Share of active area by zscore range

TEMPORAL: Rainfall + FPAR | Temperature | Solar Radiation

PHENOLOGY: Progress | Active area | Pheno of active area | Calendars

Crop calendar

Millet (2) | Millet (1) | Maize (2) | Maize (1) | Beans

# EAST AFRICA FLOOD WATCH

Sector Layers

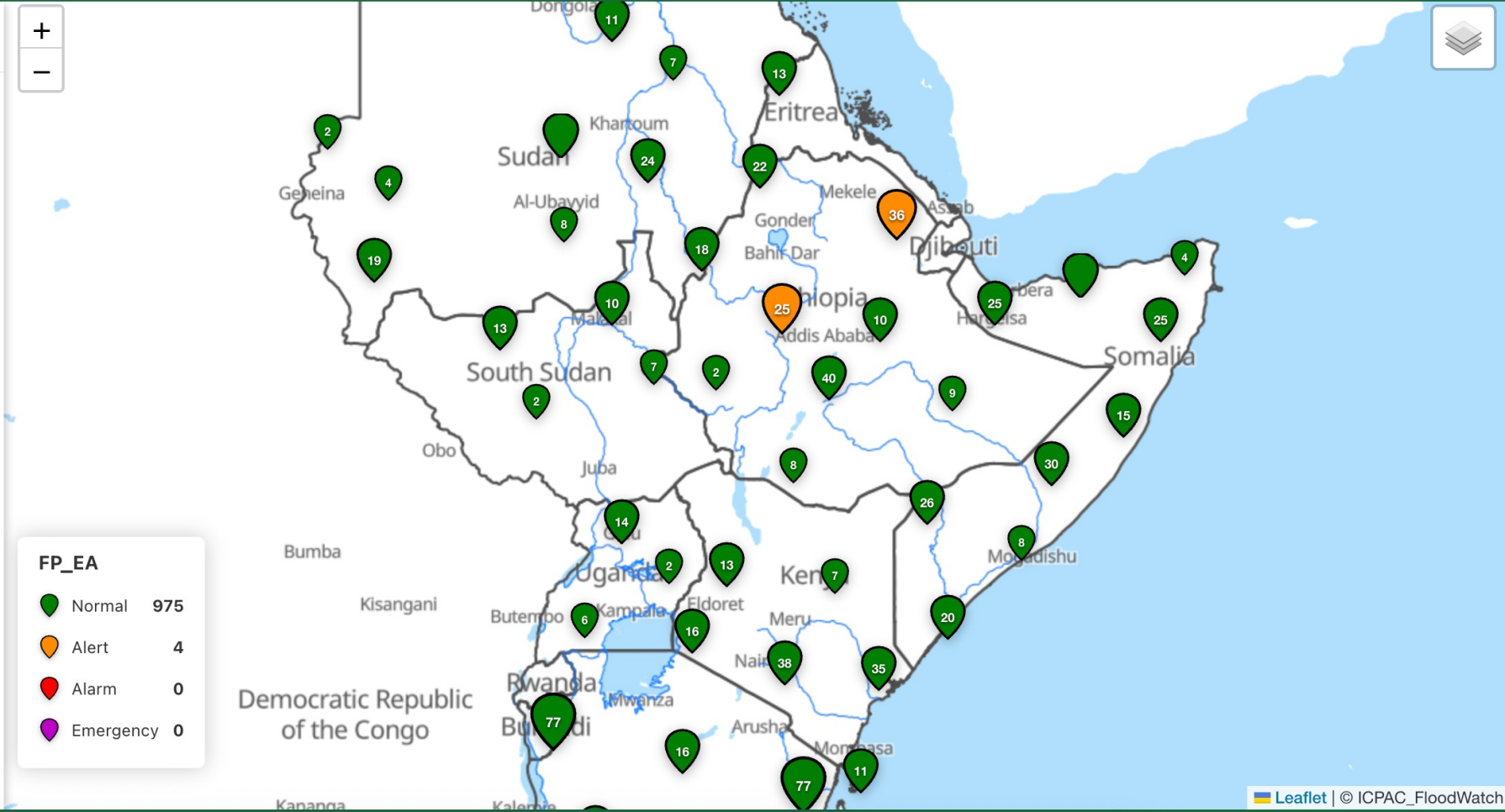
Impact Layers

### Station Information

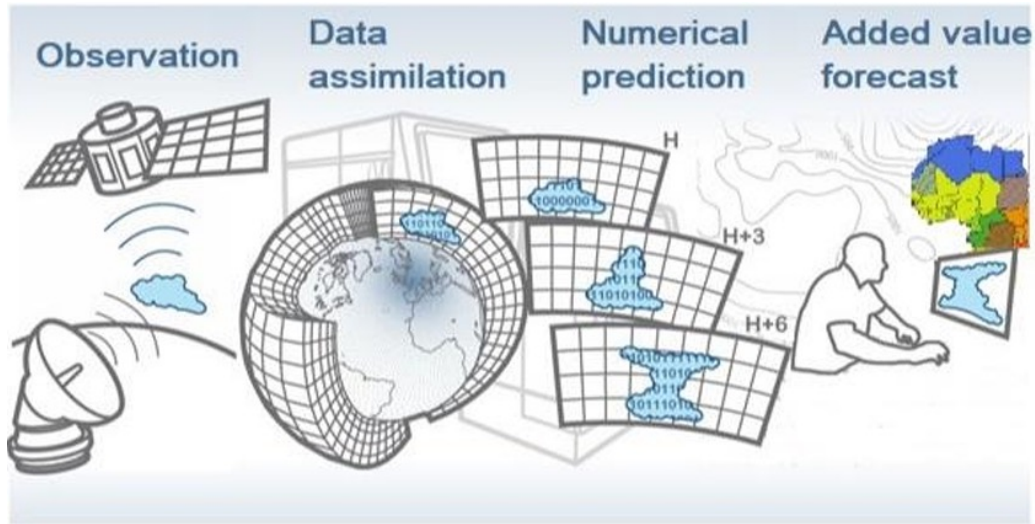
- FloodProofs East Africa i
- GeoSFM i
- Mike Hydro i
- Fast Flood i
- Glofas i



FP_EA	
<span style="color: green;">●</span> Normal	975
<span style="color: orange;">●</span> Alert	4
<span style="color: red;">●</span> Alarm	0
<span style="color: purple;">●</span> Emergency	0



# GOING FORWARD / NEXT STEPS



- SEWA RARS Upgrade & Operationalization
- Automation and Monitoring
- WIS-2 transmission
- AMSAF Integration
- Predictive Analytics – Risk Data, PLEWS, IBF
- New Regional Services – Marine Watch, Pest Watch, Air Quality



**Danke / Thank You / Asante !**



Monday, June 1, 2026

IGAD CLIMATE PREDICTION AND APPLICATIONS CENTRE  
(ICPAC)

