

# GEO WEEK & MINISTERIAL SUMMIT 2023

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SHOWCASE

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#TheEarthTalks



science & innovation

Department:  
Science and Innovation  
REPUBLIC OF SOUTH AFRICA



GEO WEEK  
2023 MINISTERIAL  
SUMMIT

GEO GROUP ON  
EARTH OBSERVATIONS

## Co-creating climate services: from data to knowledge in Africa

### Knowledge and climate services from an African and Data research Infrastructure – KADI Project

Tuesday 7th November, 11:00-11:30

Room: ORCHID

<https://kadi-project.eu>



**Dr. Theresia Bilola**

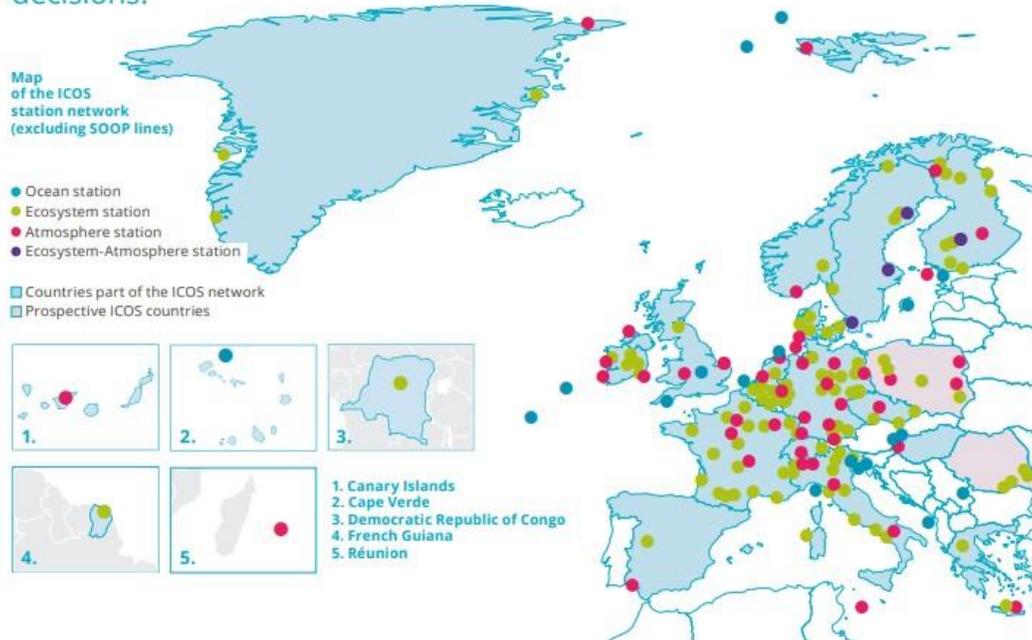
Project Manager, KADI

ICOS ERIC

### Understanding and monitoring greenhouse gases

The Integrated Carbon Observation System (ICOS) produces high-quality greenhouse gas data based on the observations made by over 170 measurement stations across Europe. This greenhouse gas data is needed to understand and mitigate climate change. ICOS data contributes to quantifying and better understanding the greenhouse gas emissions and the whole carbon cycle, in Europe and the neighbouring regions.

Through data and scientific knowledge, ICOS contributes to support climate change mitigation decisions.



A network of ICOS-certified stations provides long-term, integrated observations on the concentration of greenhouse gases in the atmosphere and observations of the gas exchange between atmosphere, land and ocean surfaces.

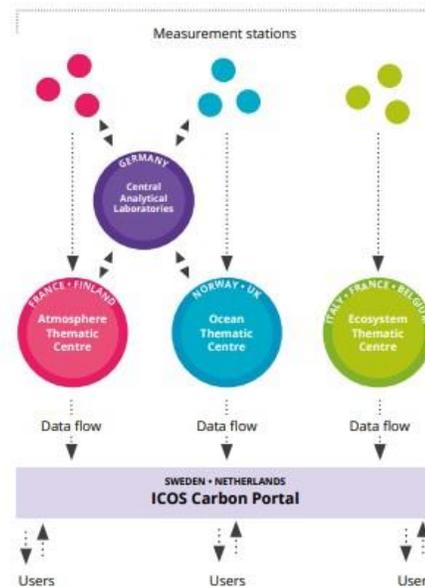
### Reliable greenhouse gas data for science-based decisions

Most economic activities produce emissions that increase greenhouse gas concentrations in the atmosphere, accelerating climate change and disrupting natural processes. A better scientific knowledge of sources and sinks of carbon is vital to make informed and sustainable decisions for a better future. With its data, ICOS supports climate change mitigation actions based on science.

### Producing reliable, long-term data

Following a rigorous protocol, ICOS integrates atmosphere, ecosystem and ocean greenhouse gas observational networks to provide near-real-time, standardised datasets and products. In the past, measurements of greenhouse gases in Europe have suffered from varying methods, discontinuity and lack of sustainability. To tackle these issues, ICOS has established state-of-the-art standardised methods to continuously gather, treat and distribute observations through the ICOS Carbon Portal.

### The ICOS data production process at a glance.

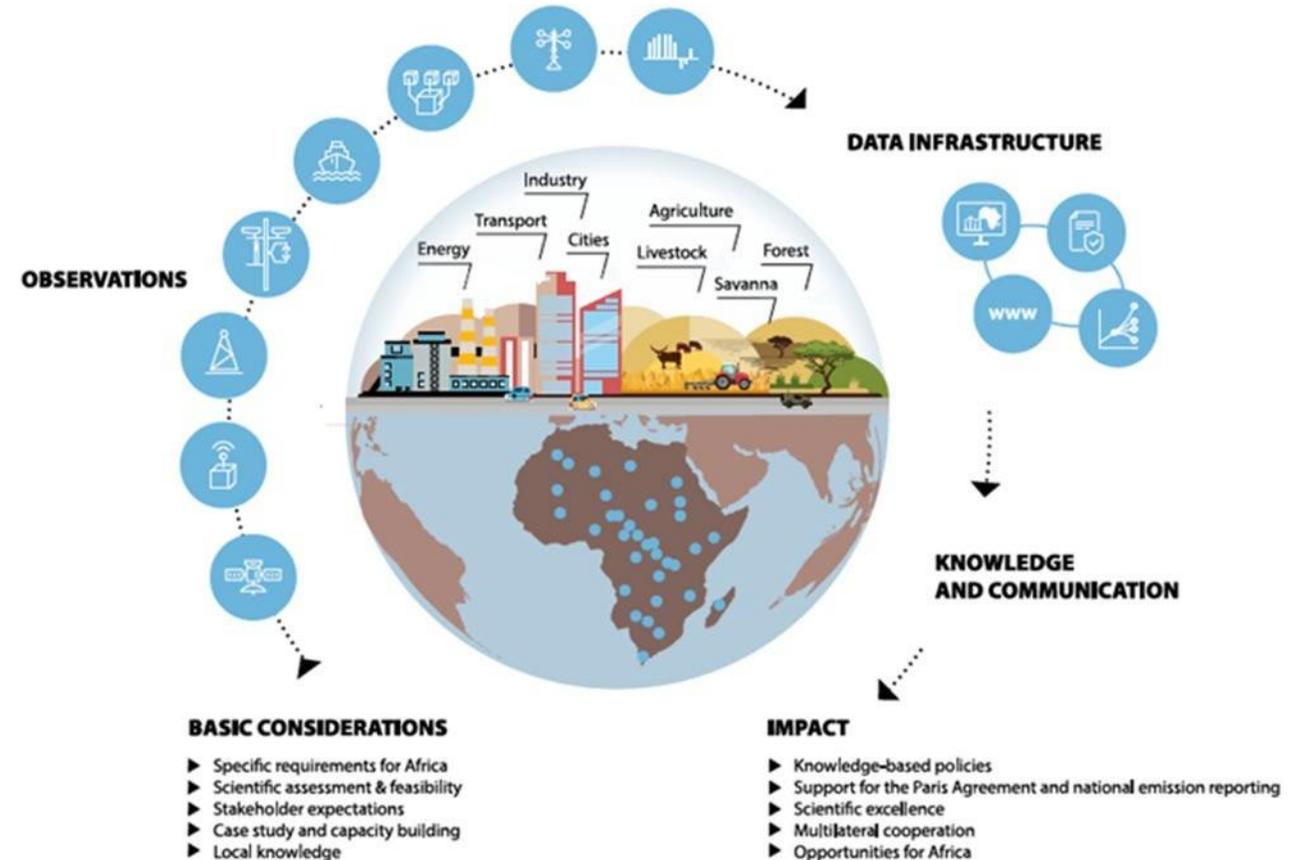


## ICOS ERIC: Integrated Carbon Observation System (European Research Infrastructure Consortium)

- Operational since 2015
- 16 countries
- 180 stations
  - Atmosphere
  - Ecosystem
  - Ocean

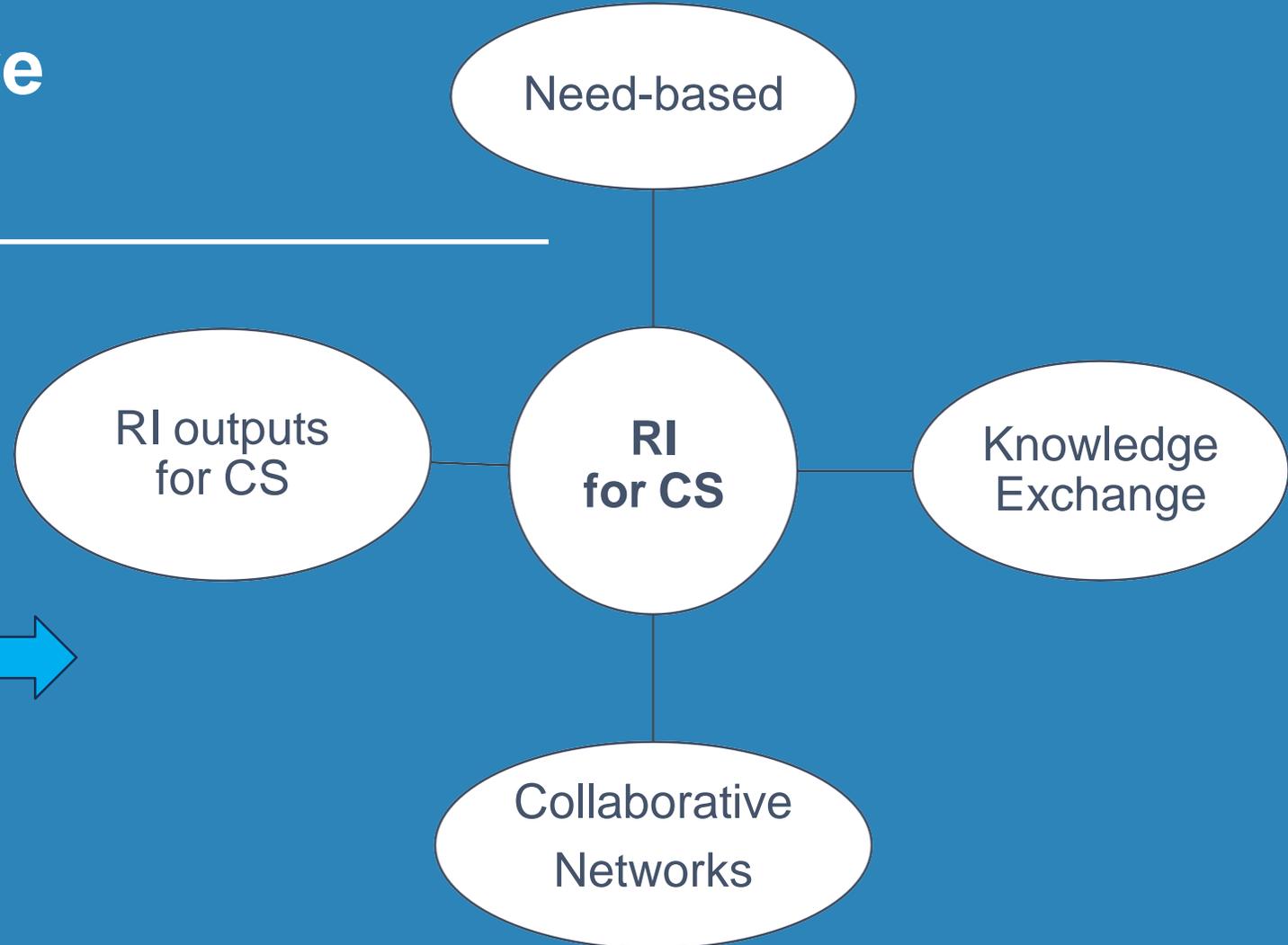
## Objectives

- Science-based services to fully address the impacts of climate change.
- Stronger inter-disciplinary AU-EU cooperation.
- Broad **exchange network** connecting **infrastructure operators, scientists, data and knowledge users, agencies, funding bodies...**
- Solid **strategy for implementation and operation** of the climate observation system in close connection to future actors and users.



# Research Infrastructure for Climate Services

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**Earth system modeling** as a tool for improved data and knowledge on **land cover** in Africa



**Cities** as complex societal systems for climate services



**Long-term cooperation** between **MET services** as the backbone of a future observation system



**Coastal bio-geochemistry of the Southern Ocean** as a crucial part of the climate and carbon system

# CLIMATE SERVICE PILOTS

- Stakeholders and Communities
- Context
- Data and Resources

# Policy Cooperation

Connect African countries to define their own required services and develop their own observational systems.

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Integrate the existing observational capacity in Africa into global and regional systems through regional and international policy frameworks and initiatives like AfriGEO, GEO, OACPS, SASSCAL, WMO, UNFCCC...

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Strengthen AU-EU links and especially the existing Climate Change & Sustainable Energy (CCSE) partnership through engagement with other projects (e.g., FOCUS Africa, LEAP-RE and ClimSA).

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Identify and develop sustainable funding solutions for RI.

# Partners and Affiliations



**ICOS** Integrated Carbon Observation System



**Trinity College Dublin**  
Coláiste na Tríonóide, Baile Átha Cliath  
The University of Dublin



**AEMet**  
Agencia Estatal de Meteorología



**NORCE**



HELSINGIN YLIOPISTO  
HELSINGFORS UNIVERSITET  
UNIVERSITY OF HELSINKI



Hellenic  
Centre For  
Marine  
Research



**MeteoSwiss**



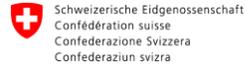
**Empa**  
Materials Science and Technology



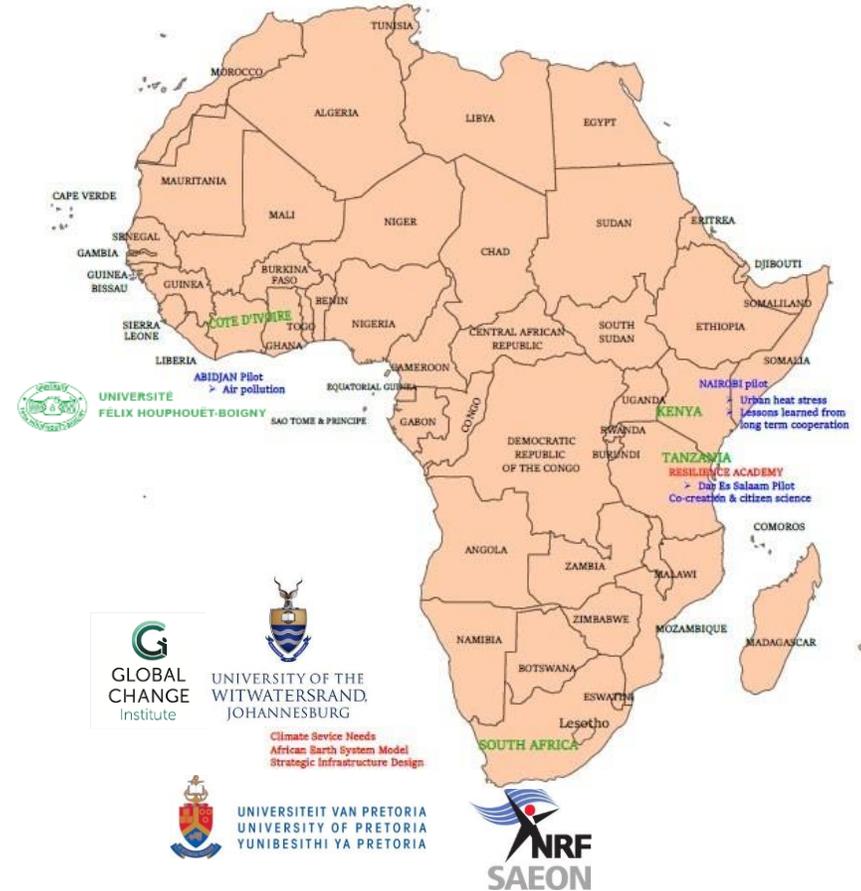
**UNIVERSITY  
OF TURKU**



**Agroscope**



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra



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**THANK YOU!**



**QUESTIONS?**

**6-10 NOVEMBER**

CAPE TOWN, SOUTH AFRICA

[theresia.bilola@icos-ri.eu](mailto:theresia.bilola@icos-ri.eu)



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Funded by the  
European Union



# GEO WEEK & MINISTERIAL SUMMIT 2023

Showcase Event

Prof Cheikh Mbow  
Director General  
Centre de Suivi  
Ecologique

**Regional Centres of Excellence and the  
importance of partnership and co-  
creation in developing climate services**

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**Are we measuring where  
resources are more  
vulnerable?**

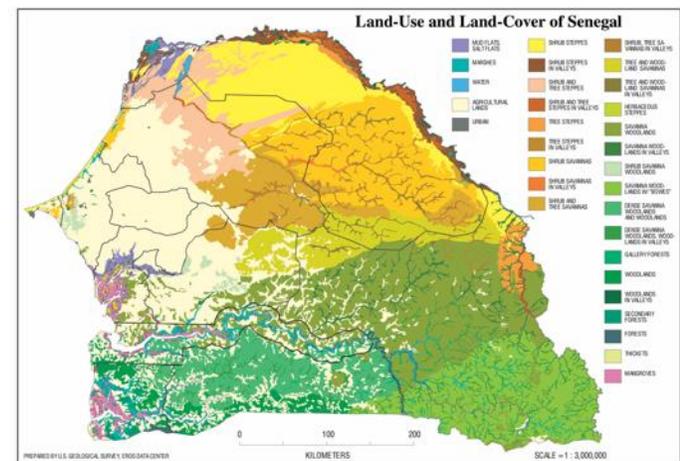
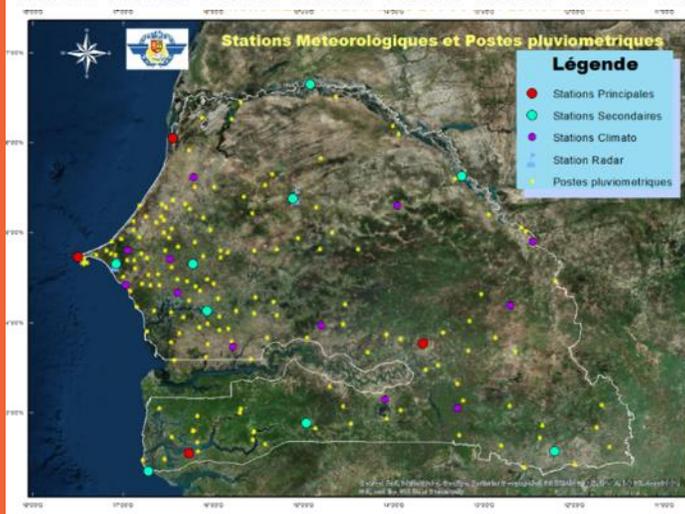
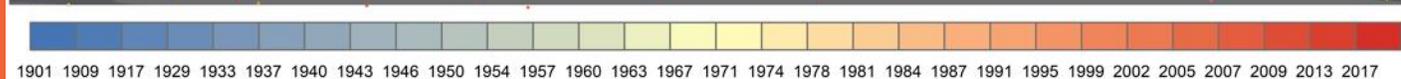
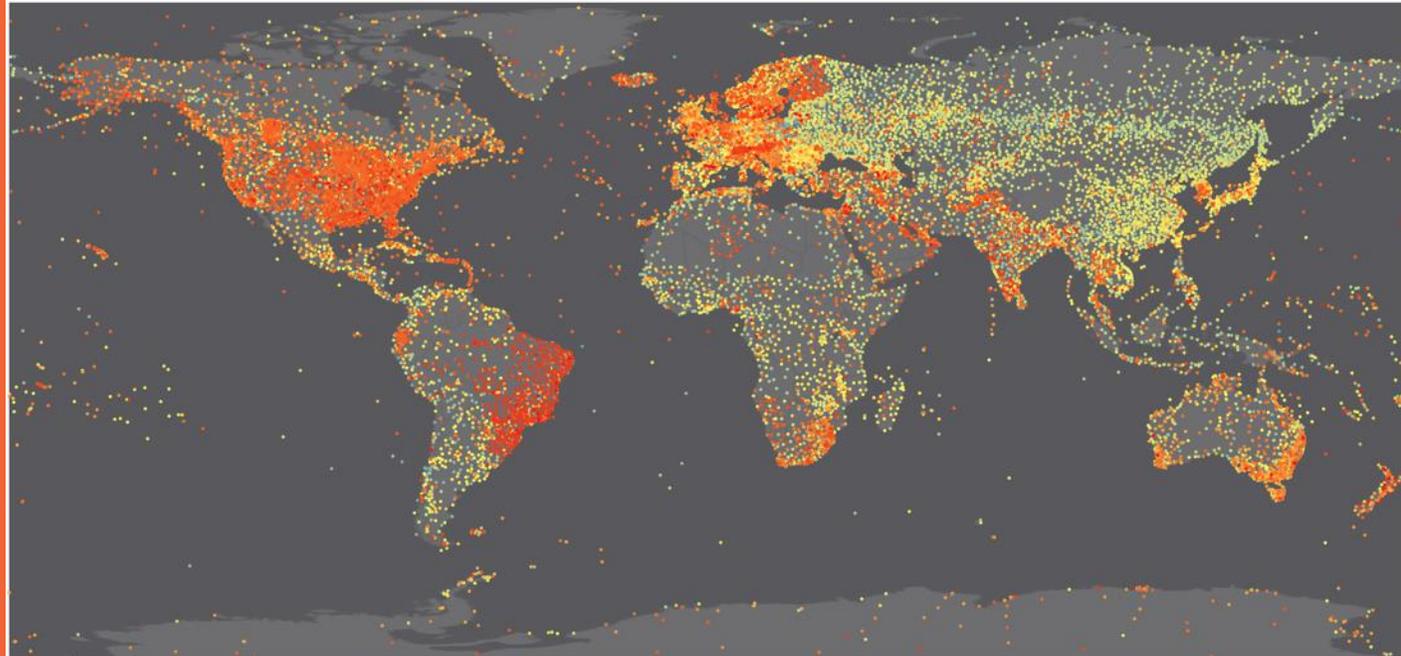


Figure 4



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Senors/Products	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2022
<b>SATELLITE &amp; DATA SETS</b>												
CHIRPS			Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
CMORPH												Green
EOS Terra MODIS NDVI							Green	Green	Green	Green	Green	Green
GCOM-W AMSR2												Green
GPCP-1DD												Green
GSMAP												Green
Hydro-Estimator												Green
JPSS SNPP/NOAA-20 VIIRS												Green
Meteosat Second Gen LSA-SAF ET												Green
MetOp ASCAT												Green
MOD16 ET							Red	Red	Red	Red		
MODIS MCD12Q1/Q2							Green	Green	Green	Green	Green	Green
MPE			Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
MSWEP			Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
NLC 1994						Yellow						
NLC 2000							Yellow					
NLC 2009									Yellow			
NOAA AVHRR GIMMS Product				Red	Red	Red	Red	Red	Red	Red	Red	Red
PERSIANN							Green	Green	Green	Green	Green	Green
PT-JPL							Red	Red	Red	Red	Red	Red
Sentinel-1												Green
SMAP												Green
SMOS												Green
SSEBop												Green
TAMSAT							Green	Green	Green	Green	Green	Green
WindSat												Green

**Legend**

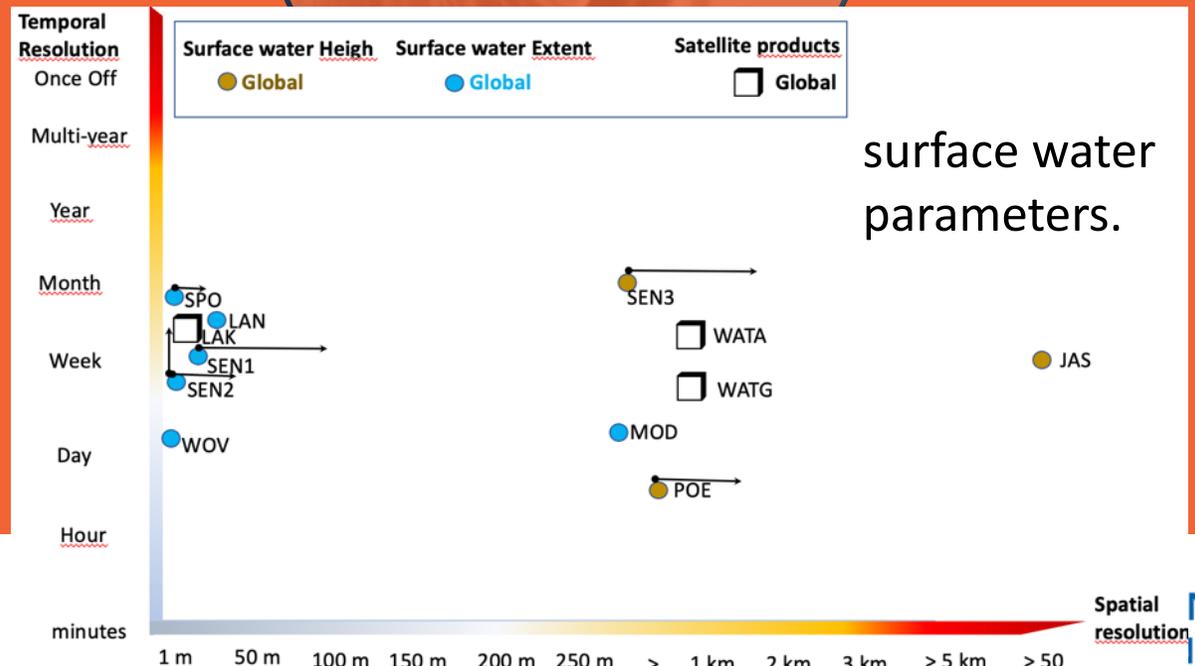
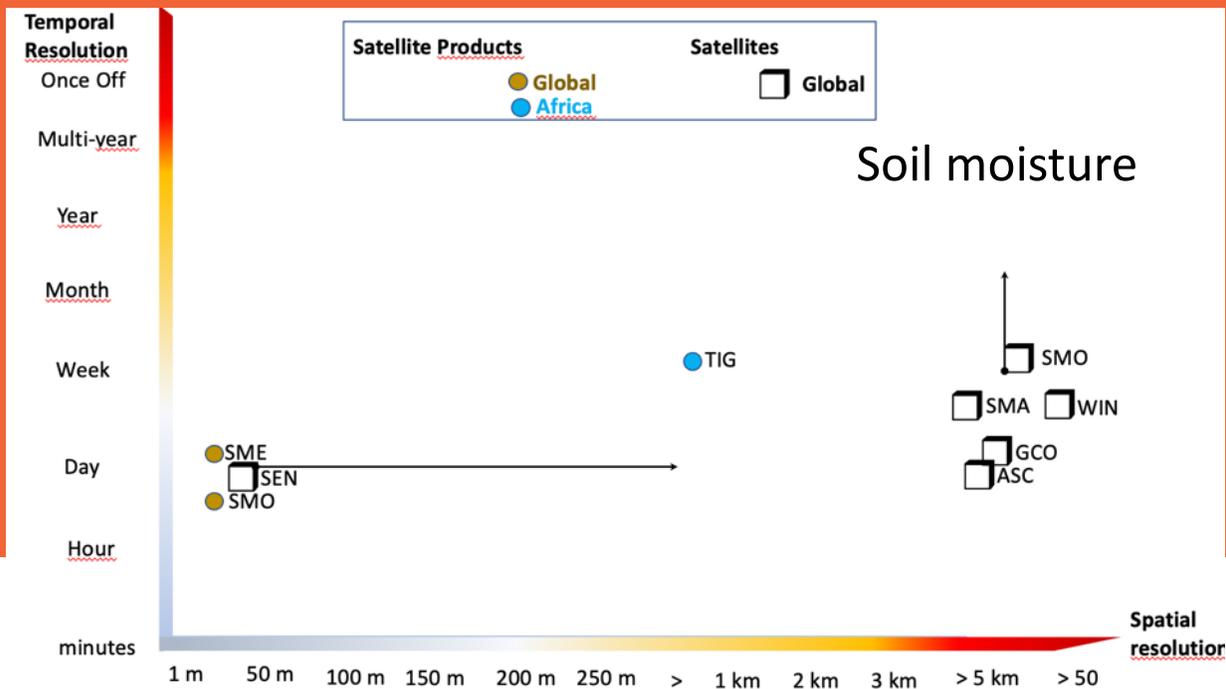
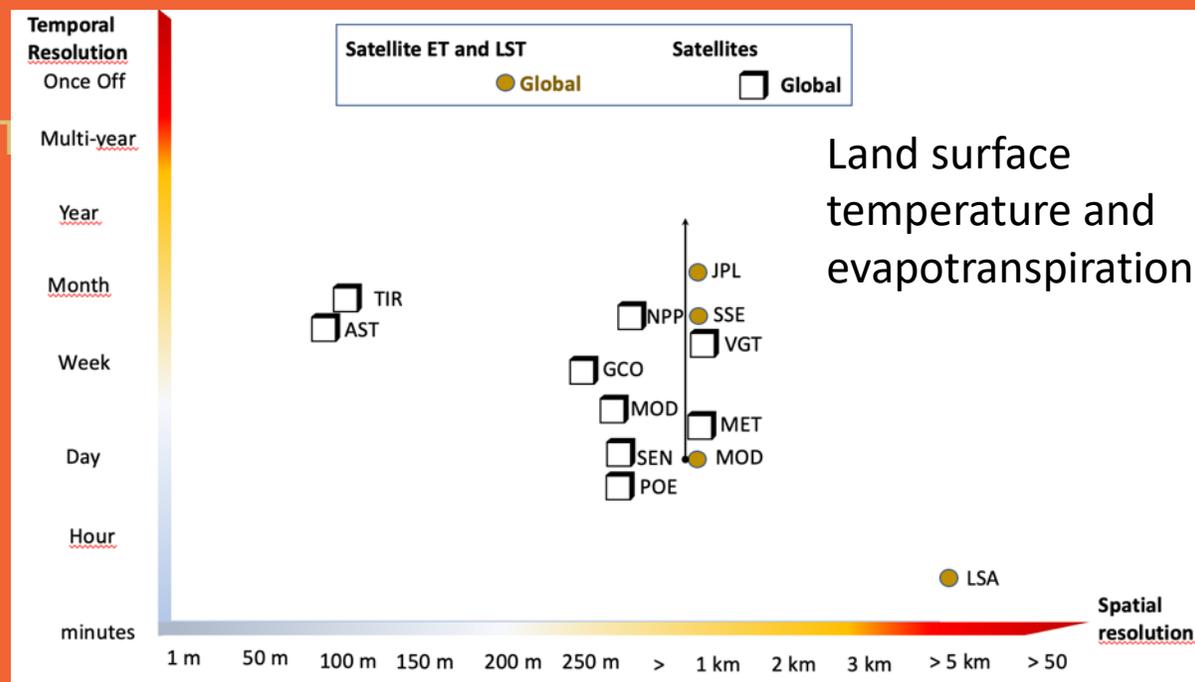
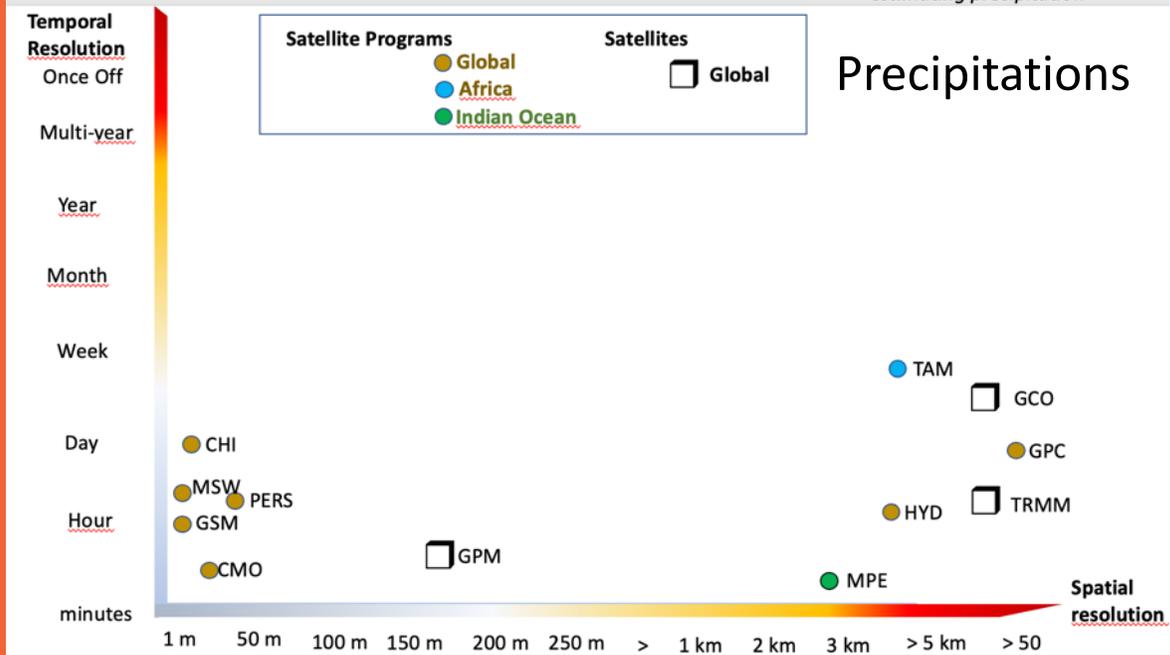
Green	Ongoing
Yellow	One off
Red	Finished

	1970											2022
<b>SATELLITE PRODUCTS</b>												
African Map of Waterbodies												
EO-1 Hyperion												Red
EOS Terra ASTER												Green
EOS Terra MODIS												Green
ESA SMECV												Green
ESA TIGER SHARE												Red
GCOM-C												Green
GCOM-W												Red
GeoEye-1												Green
Global Map of Waterbodies												Green
Global Reservoir and Lake Elevation Database												Green
GPM												Green
Jason series												Green
Landsat series												Green
Landsat TIR sensors												Green
MERIS Envisat												Red
MetOp-A/B AVHRR/3												Green
MetOp's AVHRR sensors												Green
MODIS												Green
NOAA SMOPS												Green
NOAA-POES AVHRR												Green
NOAA-POES AVHRR sensors												Green
Orbview SeaWiFs												Red
Proba-V												Red
Quickbird												Red
ResourceSat series												Green
Sentinel-1												Green
Sentinel-2												Green
Sentinel-3												Green
SPOT series												Green
SPOT-VGT												Green
Suomi NPP/NOAA-20 VIIRS sensor												Green
Terra's ASTER												Green
Terra's MODIS												Green
TRMM												Red
WorldView series												Green

# Using the large potential of EO data and services

**Legend**

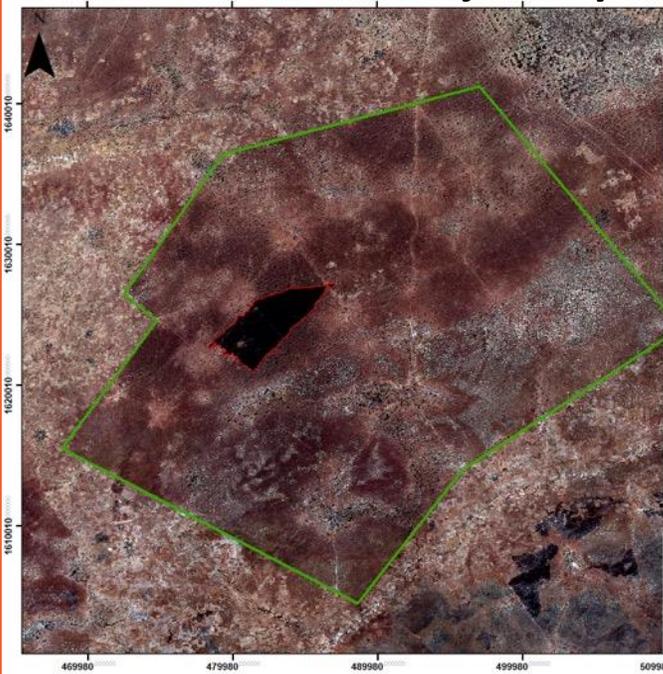
Green	Ongoing
Yellow	One off
Red	Finished





# GEO WEEK

## 18 January 2023



Localisation du cas de feu observé dans le Ranch de Doly le 18 janvier 2023

### Légende

- Extension du feu
- Limite du Ranch

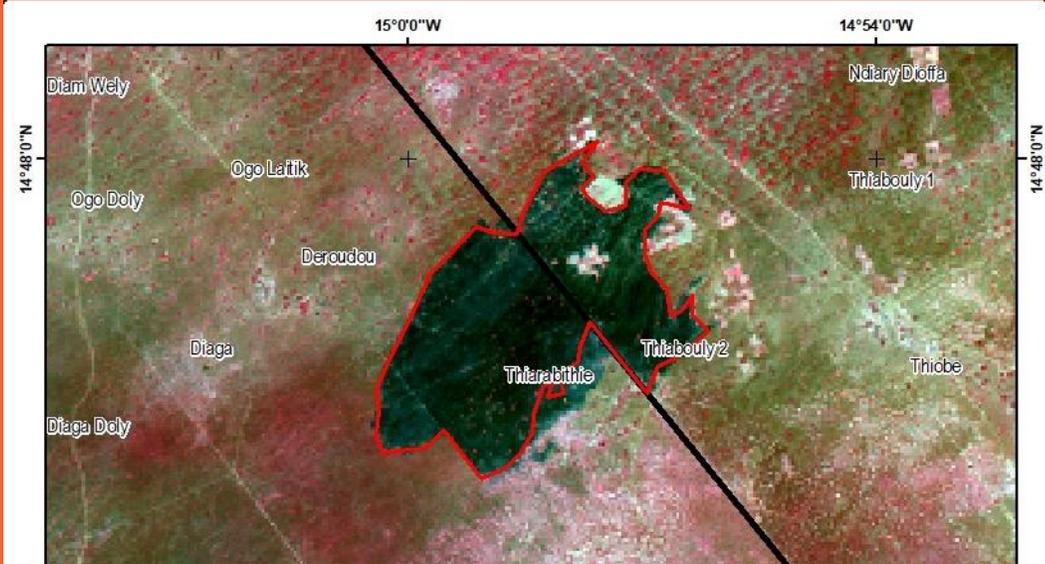


Source : ANAT, ESA

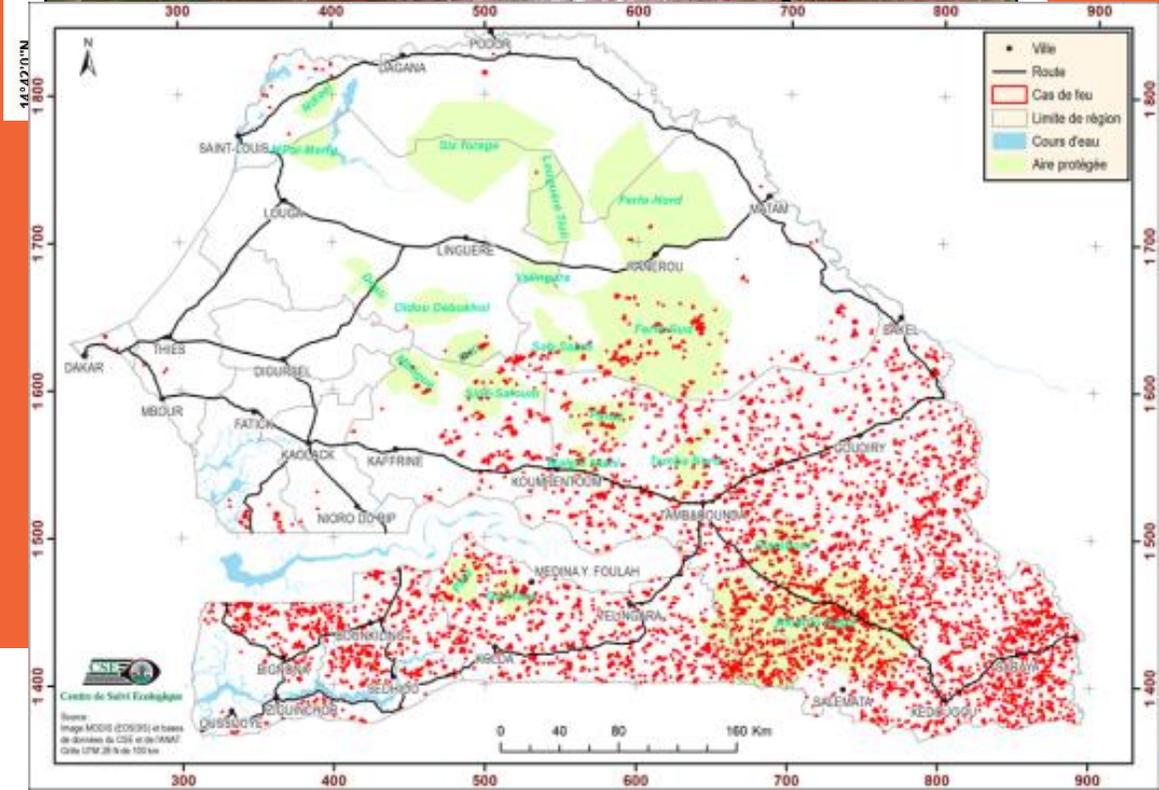
Projection : WGS 84 UTM Zone 28N



## 20 October 2023



## Summit 2023



- Ville
- Route
- Cas de feu
- Limite de région
- Cours d'eau
- Aire protégée



Centre de Saint-Etienne  
Image MODIS (2003) et base de données de CSE et de l'ANAT  
Grille UTM 28 N de 100 km



# Addressing recurrent weather events : Role of local operational services (\*DEFCCS)



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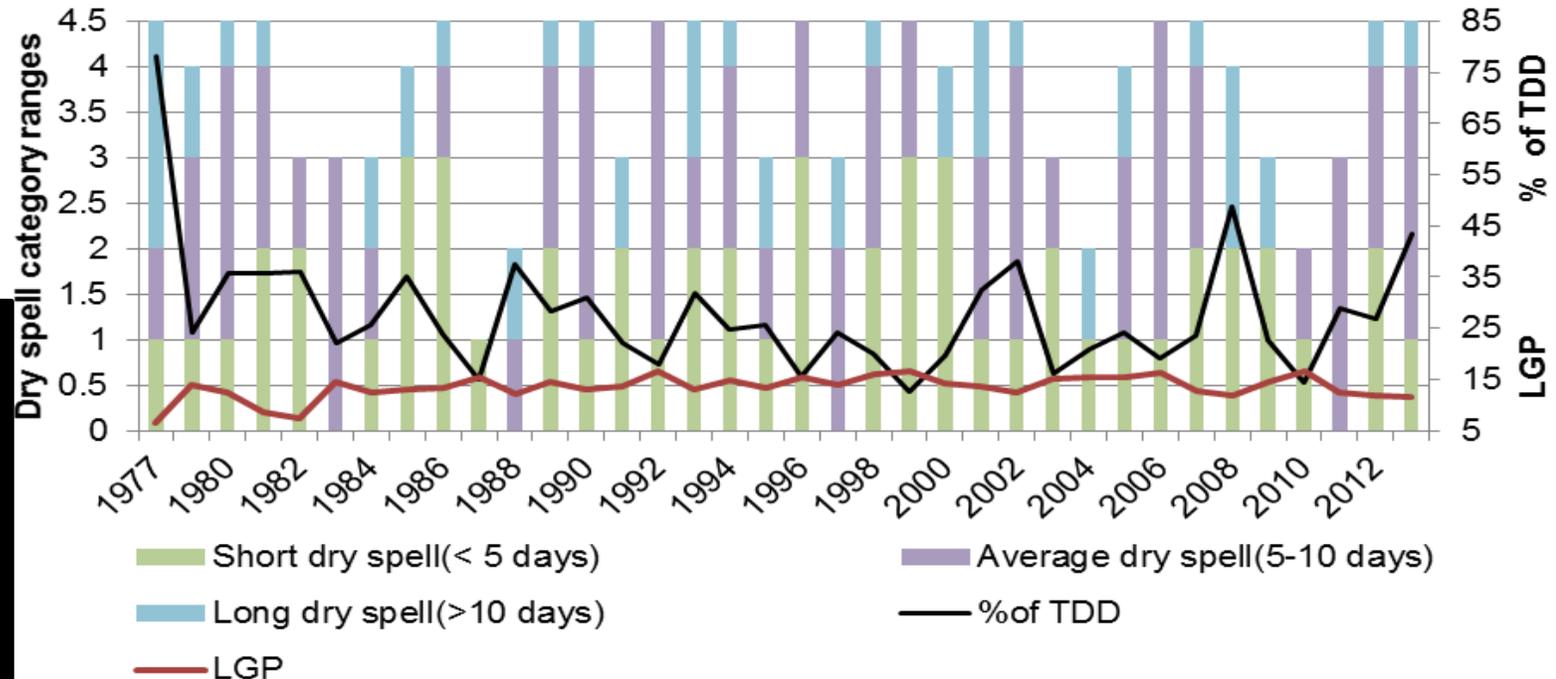
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## ROUP ON RATIONS



## Extrêmes vs slow climate variables > mid-range CS

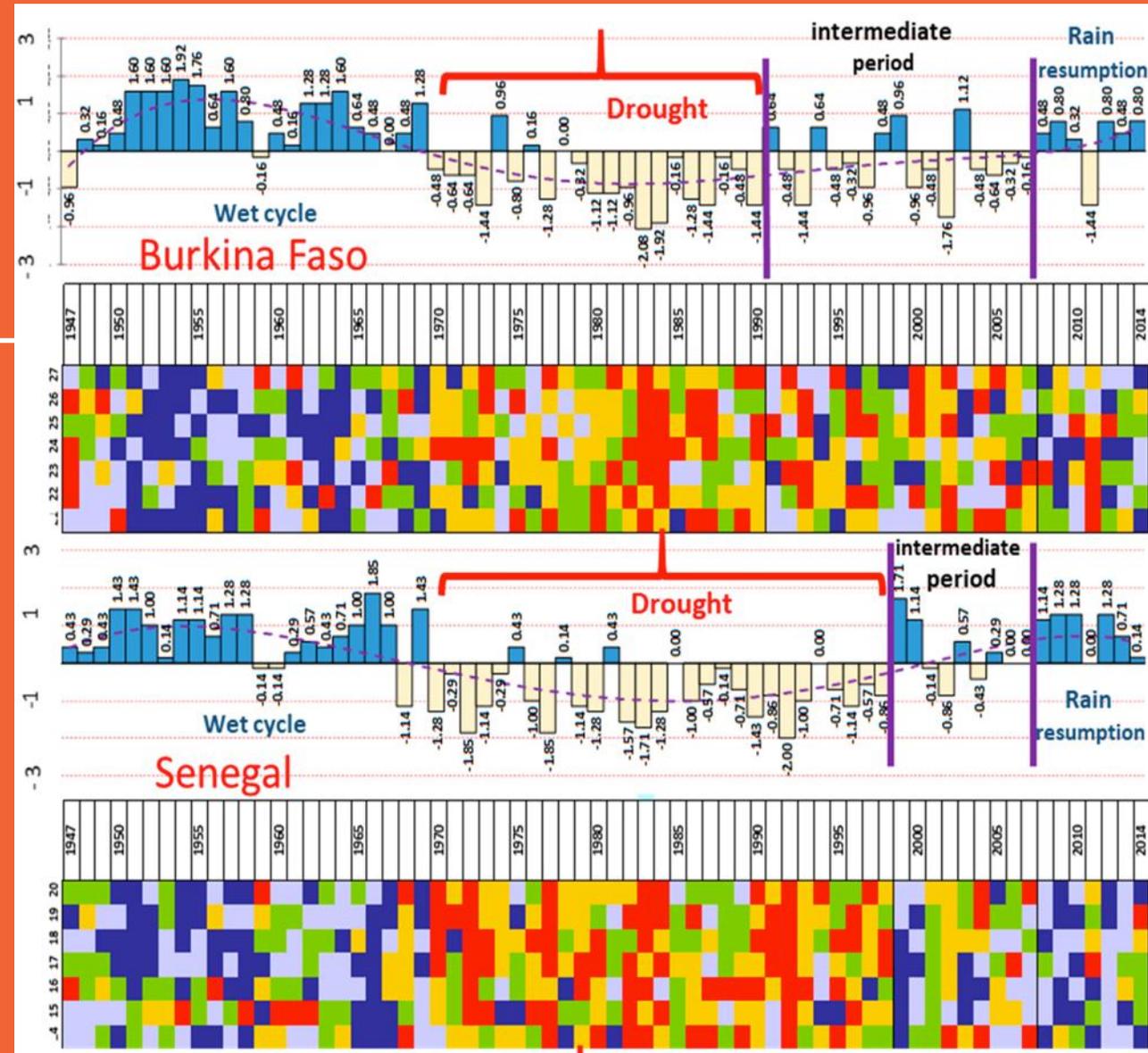
1. Dry spells of 5 to 10 days are more frequent.
2. Dry spells at onset of the rainy season are more frequent
3. Shorter rainy season
4. More extremes weather events



# Long-term effects of seasonal change

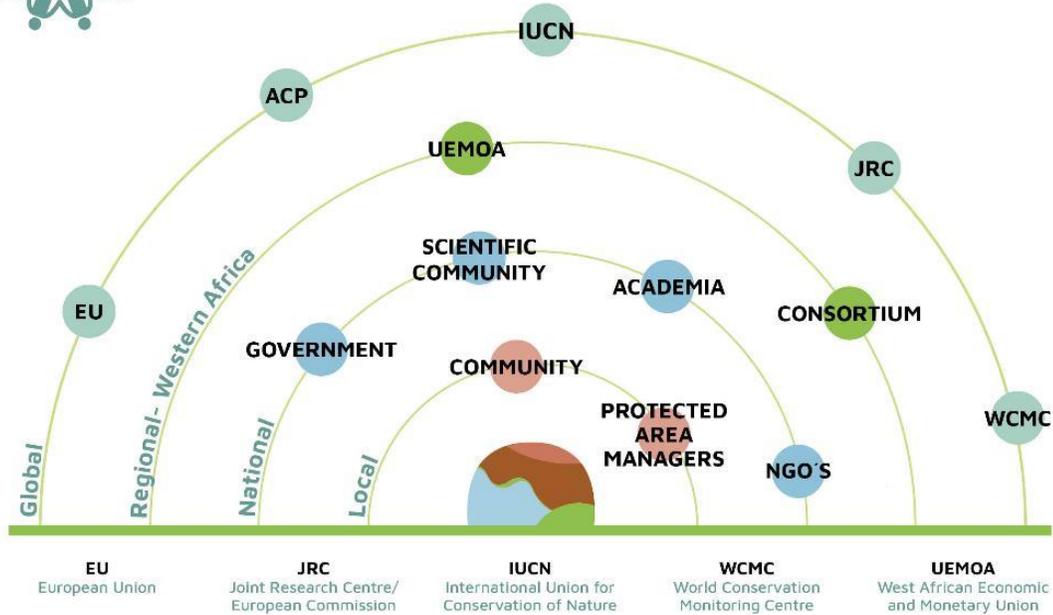
## Impacts:

- Water quantity and quality
- Pastoral activities,
- Food production
- Biodiveristy and ecosystemes, etc.





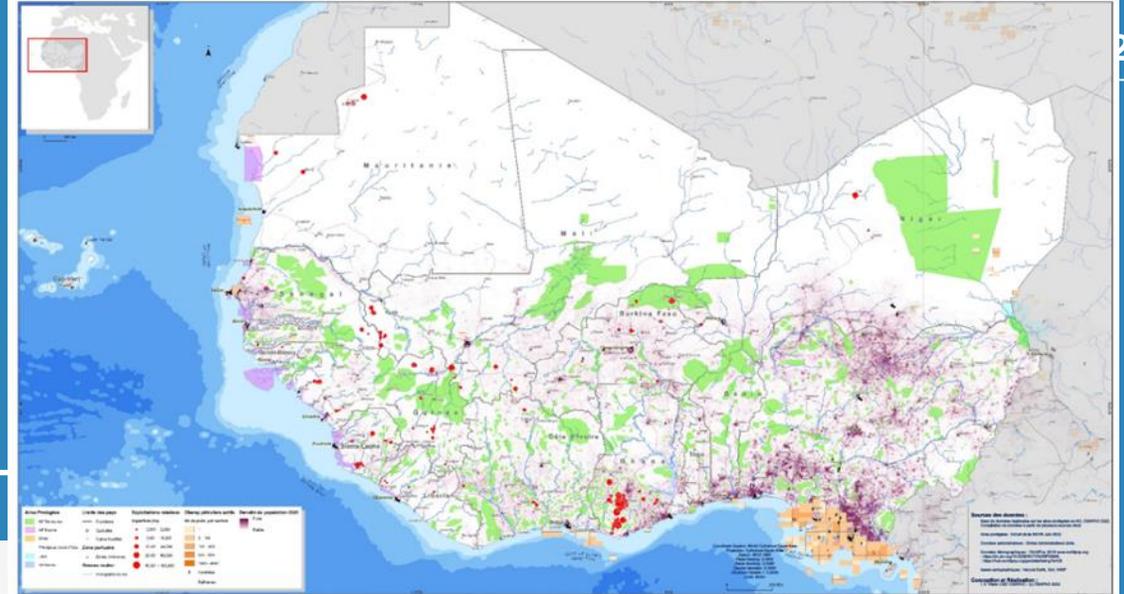
Stakeholders



# Observatoire pour la biodiversité et les Aires Protégées en Afrique de l'Ouest (OBAPAO)

#Th

Réseau des Aires Protégées d'Afrique de l'Ouest, le défis de la connectivité face aux enjeux du développement !



Observatory for biodiversity and protected areas in west Africa

Delivering information for better decisions

Improve the long-term conservation and sustainable use of natural resources in West Africa

Equitable governance and effective management of protected areas are enhanced

Capacity Development



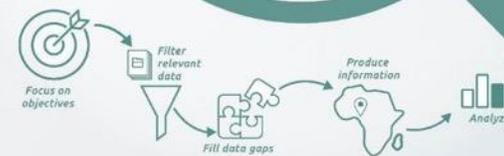
Regional Reference Information System



Communicate



Produce knowledge



BIOPAMA donateurs & partenaires



**Centre de Suivi Ecologique**



From Knowledge to Action for a Protected Planet



**Observatory for Biodiversity  
and Protected areas in West Africa**

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