

UN Austria Symposium 2022



Session 2 “Monitoring Earth from space”

Space Observation for Climate Change Effect

Dr. Ayman Ahmed
Egyptian Space Agency

Agenda

What is Climate Change?

Why Climate Changes?

Effect of climate Change.

Climate Change in Africa.

Space and Climate Change.

EgSA- Climate Related Projects

African Space Agency and climate Change

What is
Climate
Change?

Climate change refers to long-term change in:

Temperatures

Weather patterns

These changes are basically due to human activities.

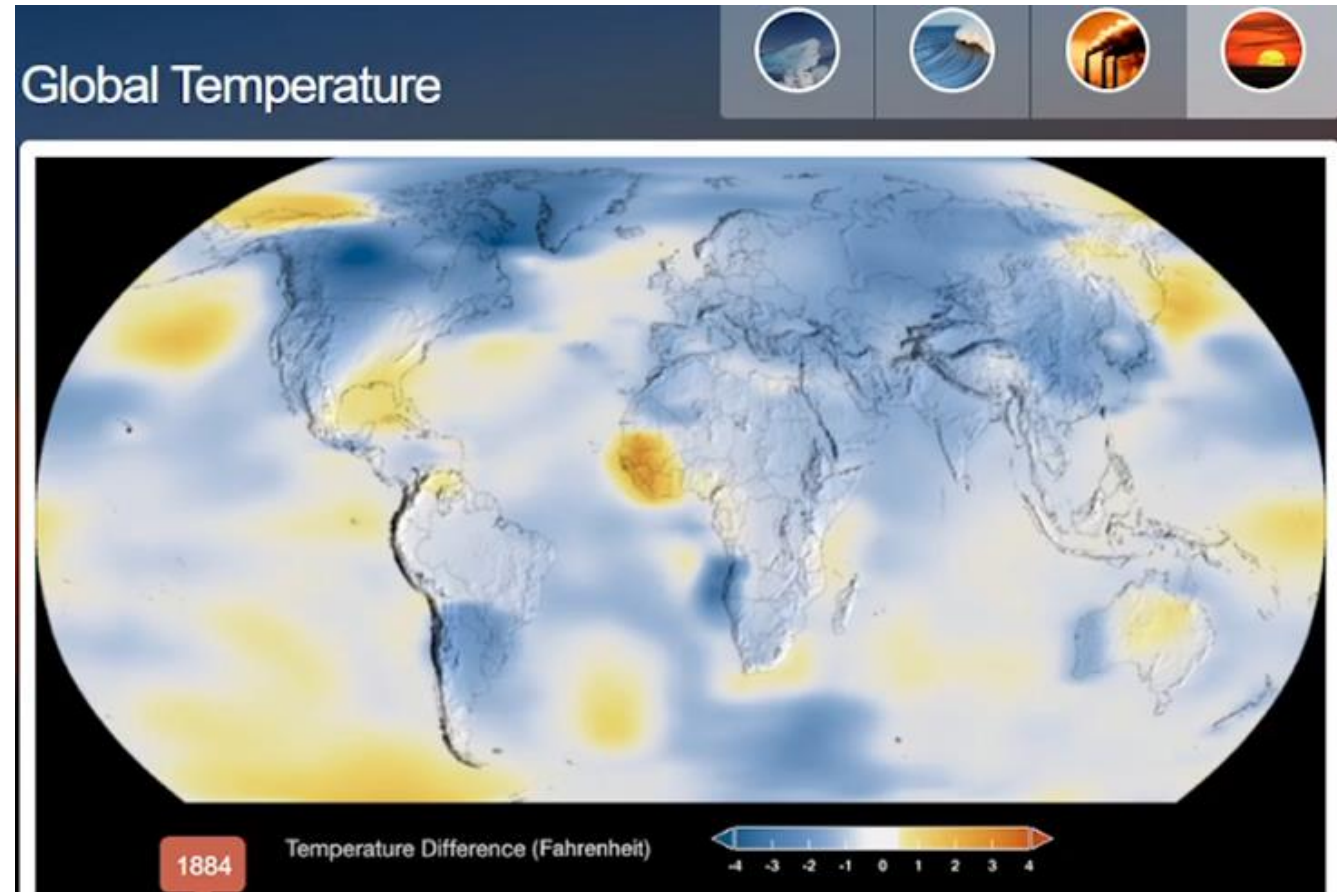


Temperature
Rise globally

Over decade

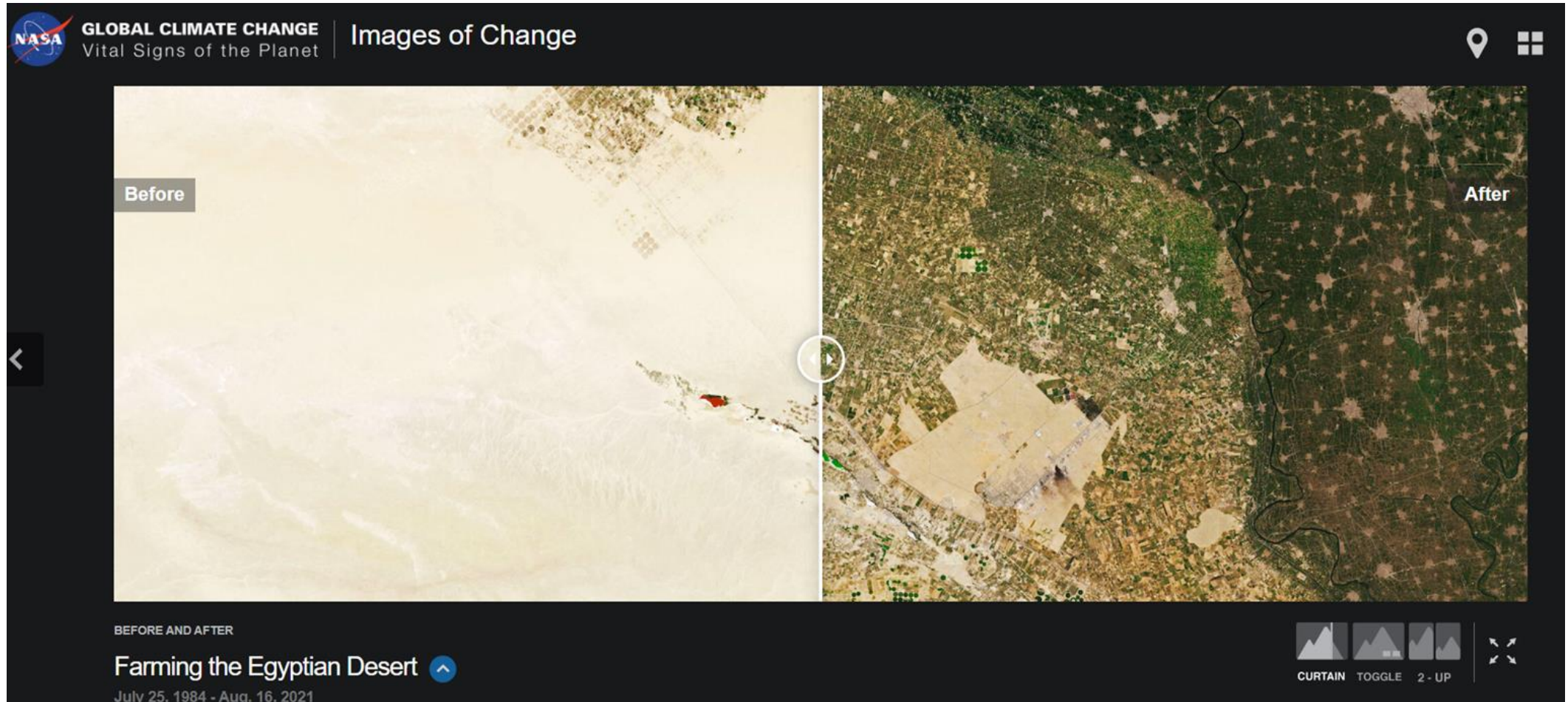
Temperature raised
dramatically

ICE melting



<https://climate.nasa.gov/>

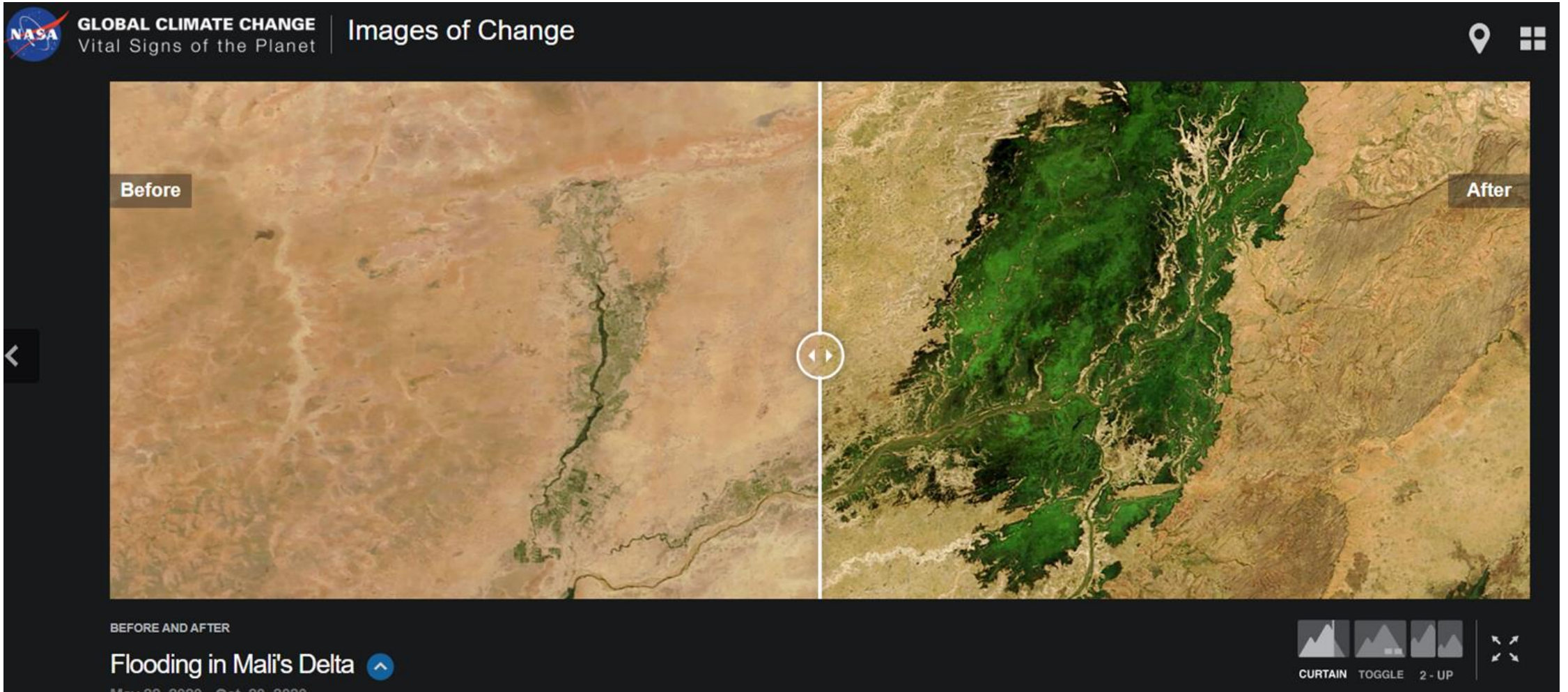
Climate Change Effects On Africa



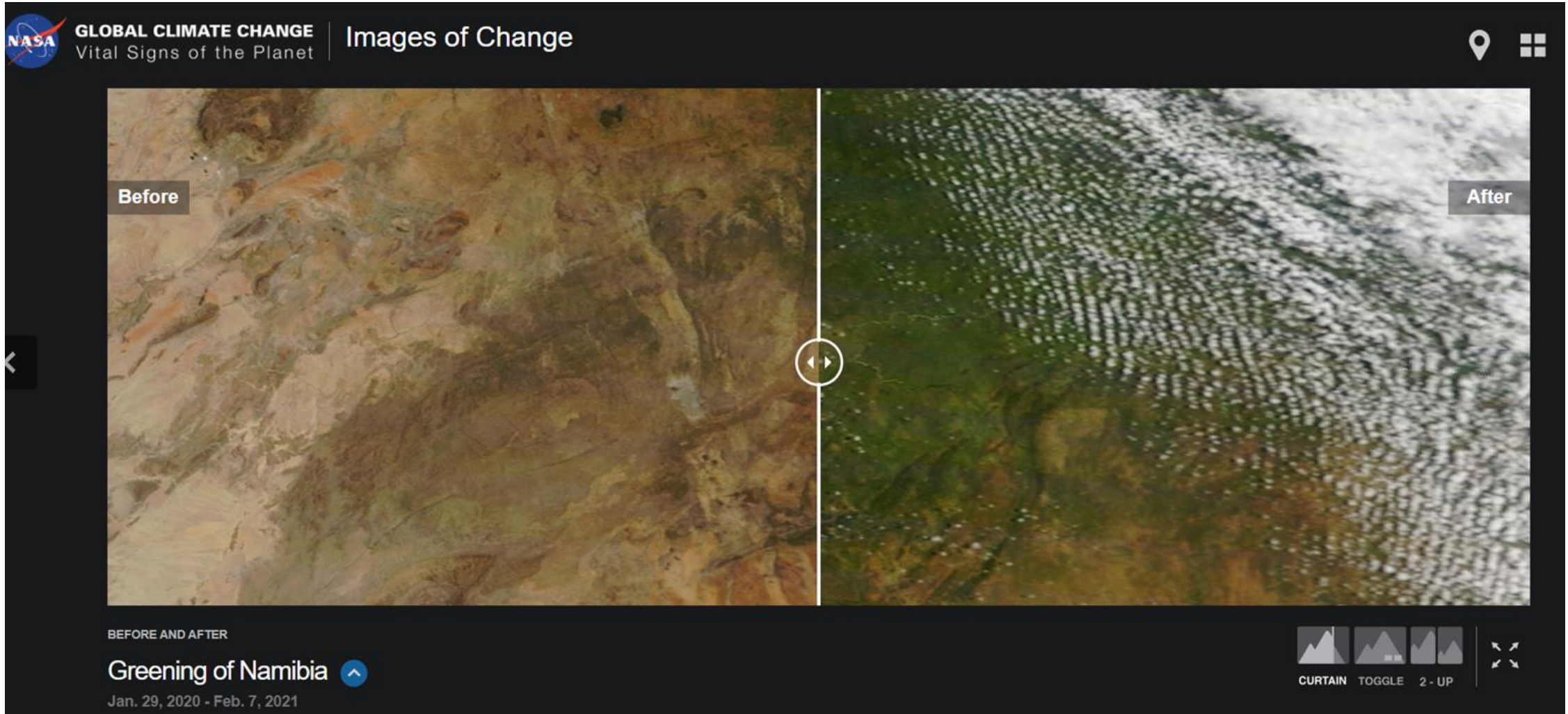
Climate Change Effects On Africa



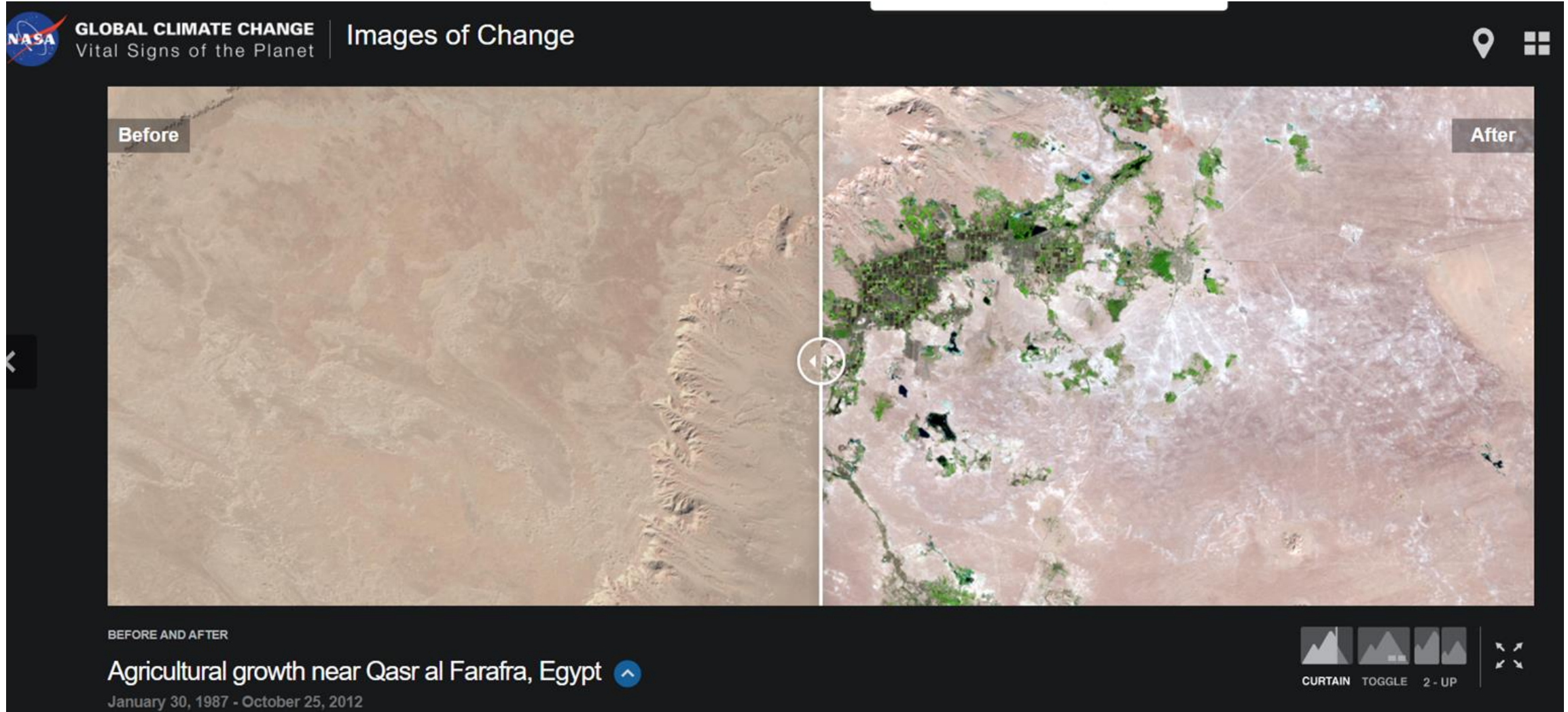
Climate Change Effects On Africa



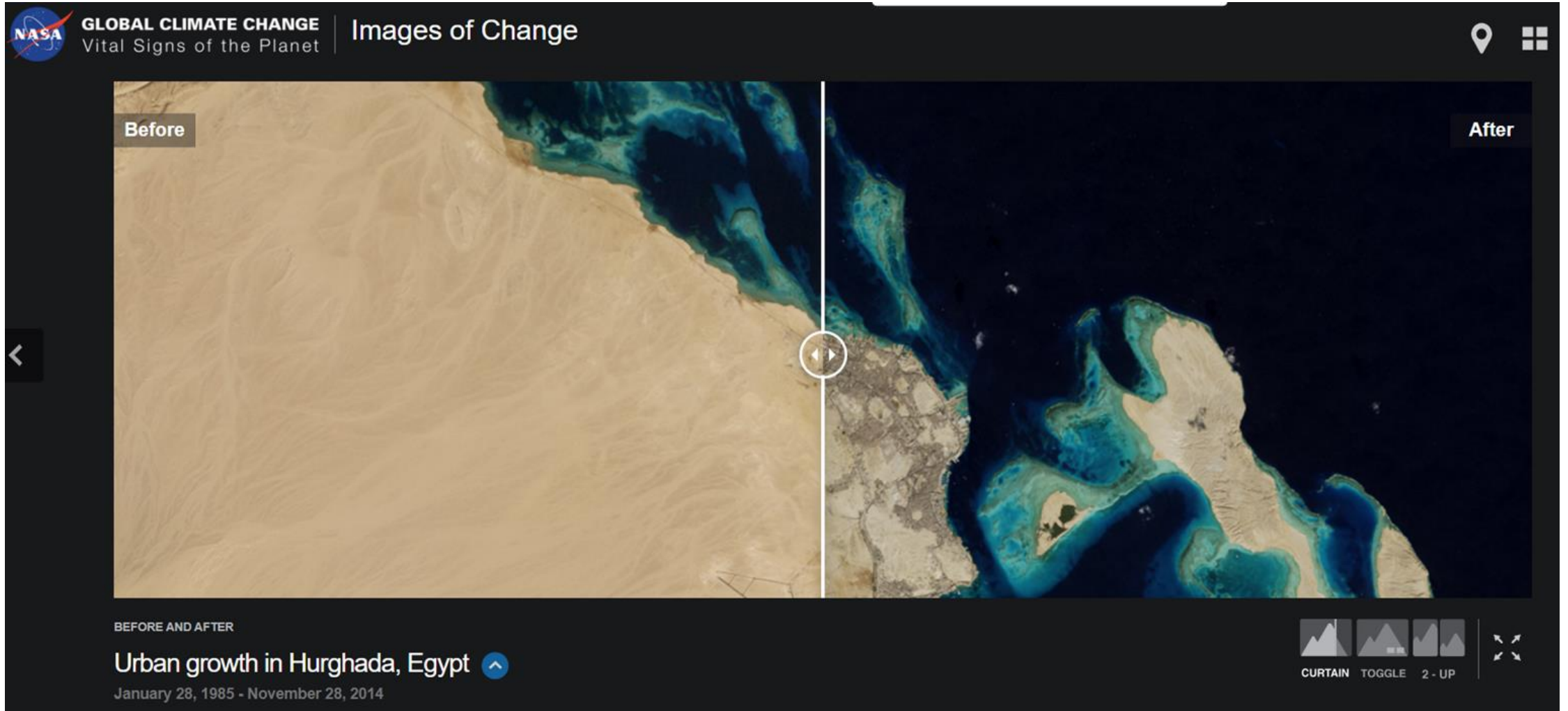
Climate Change Effects On Africa



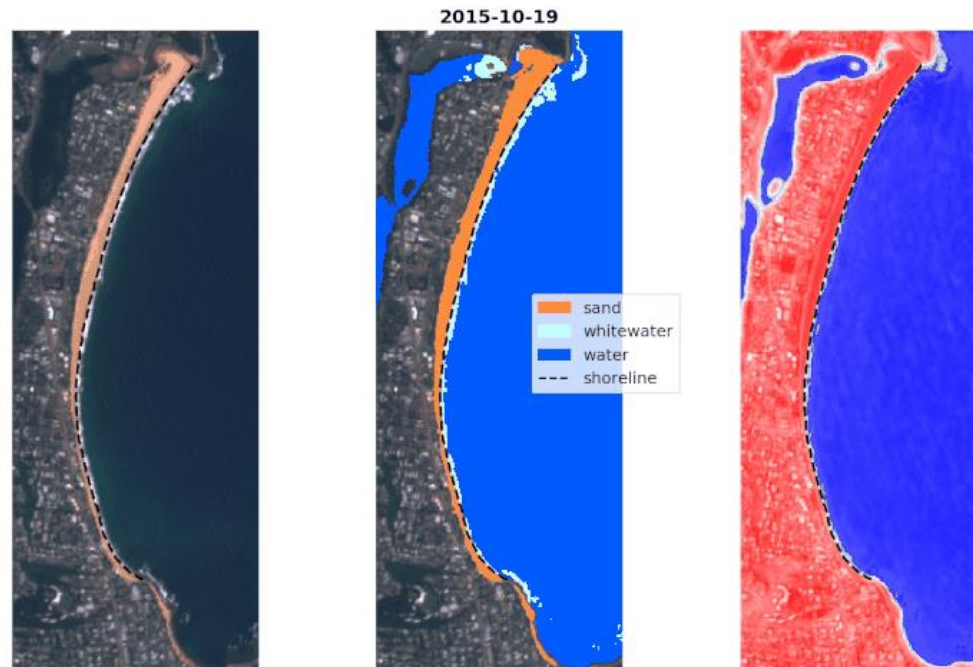
Climate Change Effects On Africa



Climate Change Effects On Africa



ClimCam Project



30+ years time-series analysis of shorelines with global coverage

<https://github.com/kvos/CoastSat>

Clim Cam

United Nation Access to Space for All

Hands-on Component

*Accessing Space with the ISS
Bartolomeo Platform*

*Bartolomeo is an application platform
on board the European Columbus
module of the ISS located on its outer
shell- built by Airbus*



***Bartolomeo Mounted –Remote Sensing Camera System for
Monitoring Weather, Floods, and Climate Change Effects in East
Africa.***

EKU- ClimCam

Egyptian Space Agency,

Kenya Space Agency,

Uganda Ministry of Science Technology & Innovation.



Clim Cam

Objectives:

Determination and allocation of climate change effects at East Africa region.

Imaging East Africa with daily coverage area at least 20 Km² and Ground Sampling Distance 10 m at 400 Km altitude.

Technology demonstration of the camera system onboard the ISS at exposed space environment.



United Nation Sustainable Development Goals

SDG-2: Zero Hunger,

SDG-4: Quality Education

**SDG-9: Industry, Innovation And
Infrastructure,**

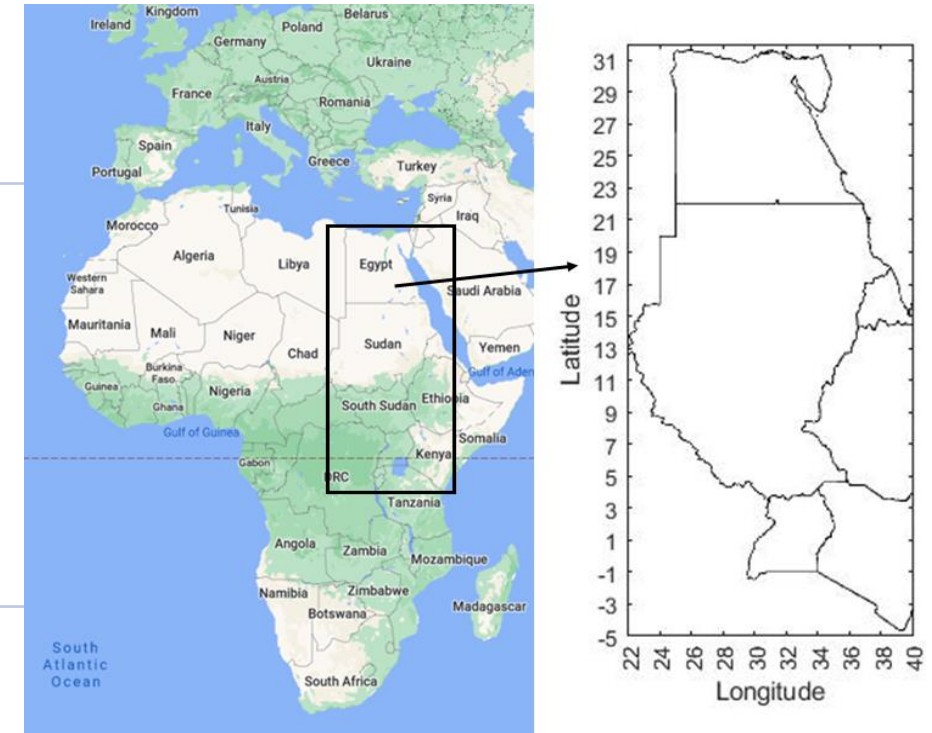
SDG-13: Climate Change Action,

SDG-17: Partnership For The Goals;

Clim Cam

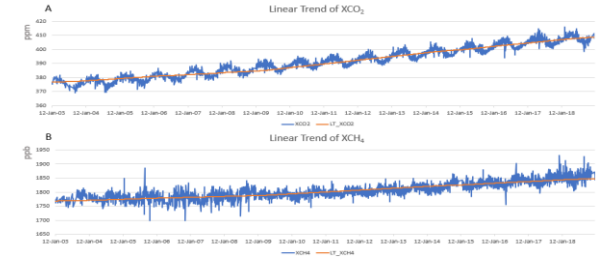
*Regional cooperation between Egypt,
Kenya And Uganda*

*Coastal areas,
Vegetation,
Droughts,
Water Resources*

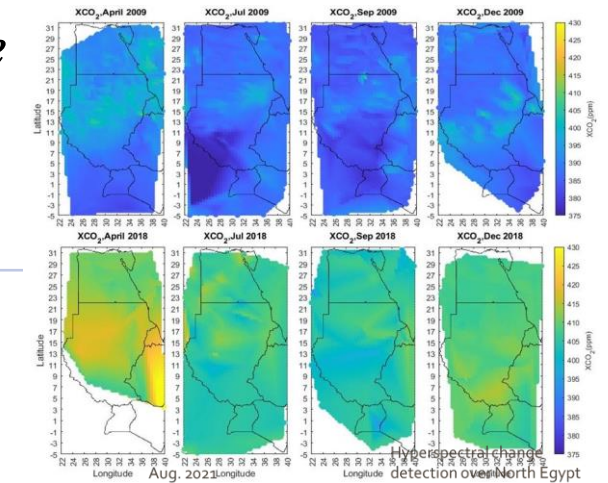


Clim Cam

Correlate the climate change variables with the effects Temperature, CO₂, CH₄, precipitation



Artificial intelligence module for prediction of temperature variation and its effect on East African countries.



Forest fire detection using hyperspectral data



Costal erosion rate estimation

Clim Cam

What the team
will benefit from
ClimCam?

Build Experience

Technical Cooperation

Monitor the East African
region for food security

Enhance space based
earth observation for
climate change effects
mitigation



Clim Cam

What the team
will benefit from
ClimCam?

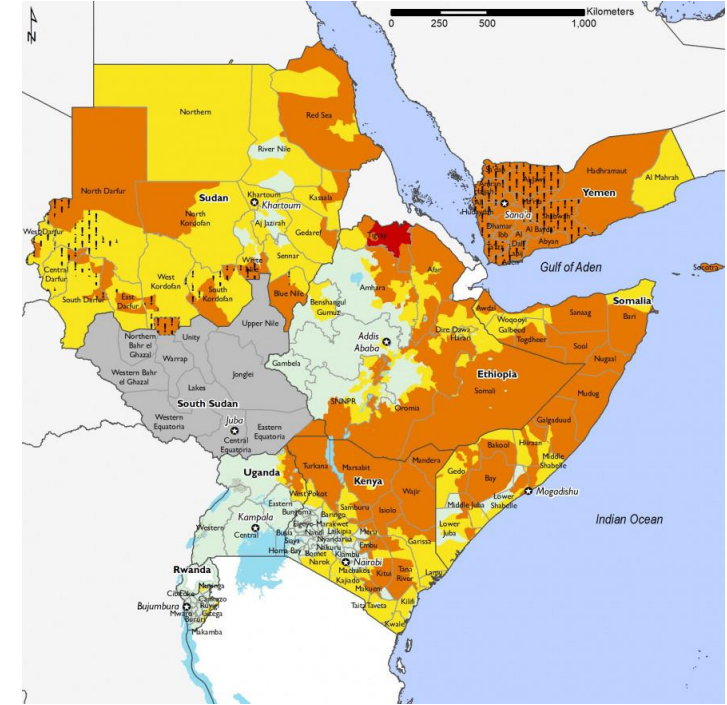
Uganda intends to **increase
access to information,**
knowledge and technologies
for farmers;

reverse land fragmentation for
land mechanization;

gather **agricultural
data/statistics;**

improve weather information
Usage of water resources

Fresh water resources like Lake
Victoria cover around 1/3
Uganda's total landmass

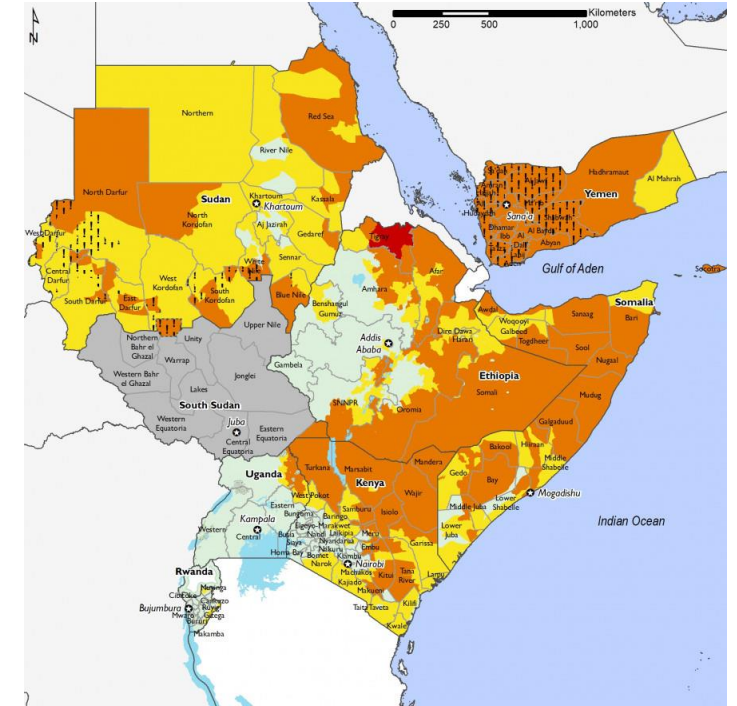


IPC v3.0 Acute Food Insecurity Phase
<https://fews.net/east-africa/food-security-outlook/march-2021>

Clim Cam

What the team
will benefit from
ClimCam?

Kenya is strengthening
natural resources
protection, including forest
and halieutic resources,
through the involvement of
several public bodies



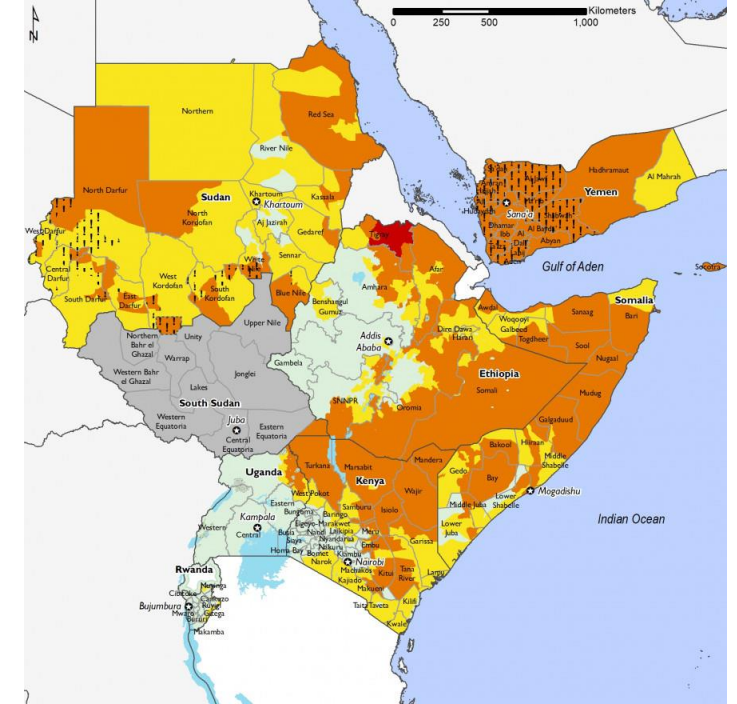
IPC v3.0 Acute Food Insecurity Phase
<https://fews.net/east-africa/food-security-outlook/march-2021>

Clim Cam

What the team
will benefit from
ClimCam?

Egypt is highly vulnerable to
water scarcity, droughts,
rising sea levels, and other
adverse impacts of climate
change.

We are trying to build
predictive model that helps
us mitigate the effect of
climate change.



IPC v3.0 Acute Food Insecurity Phase
<https://fews.net/east-africa/food-security-outlook/march-2021>

Clim Cam

What is next?

We hope this mission will become a **success story** in the region and encourage many African countries to work collaboratively in the future.

We also anticipate that this will expand and deepen our network of engineers, researchers, and **academia in Egypt and other countries** to build a sustainable and growing workforce.

The data that we acquire from ClimCam will be used to **build capacity both locally and regionally**.

We aim to disseminate our work and be able to share it with the **whole region and future generations**.



Thank you