جمهورية مصر العربية
وزارة التعليم العالي والبحث العلمي
الهيئة القومية للاستشعار من البعد وعلوم الفضاء
National Authority for Remote Sensing and Space Sciences

NARSS E-Station

Presented by

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9 May 2023

"NAFCoast project"

Project PI

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E-Staion Supervision

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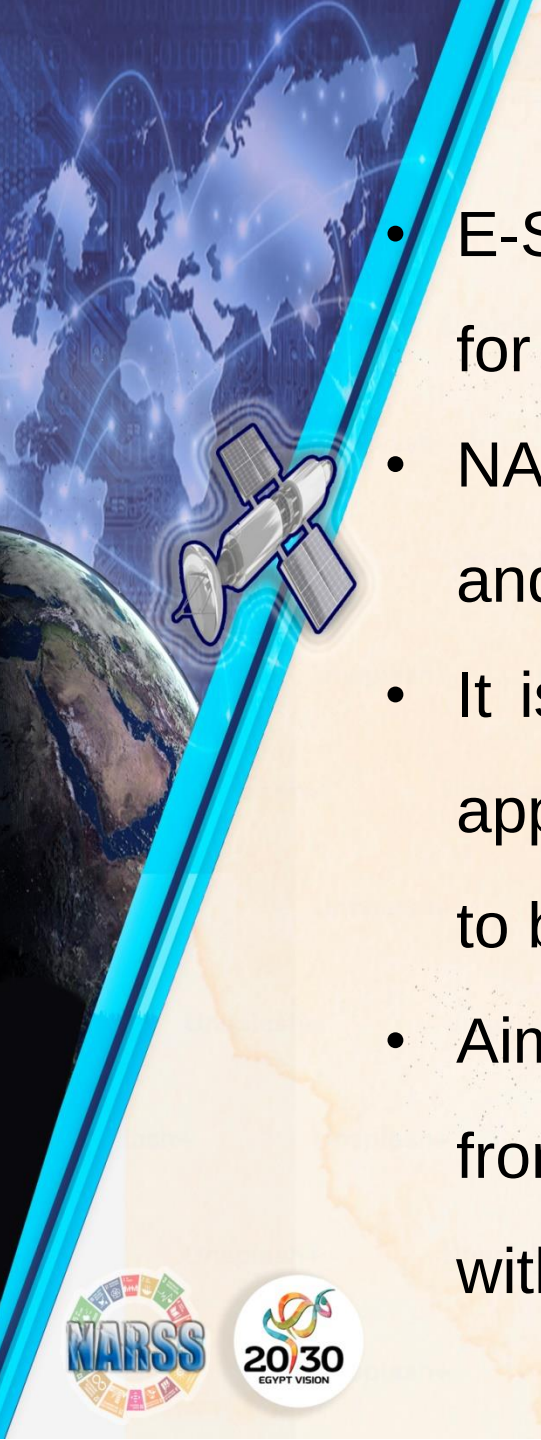
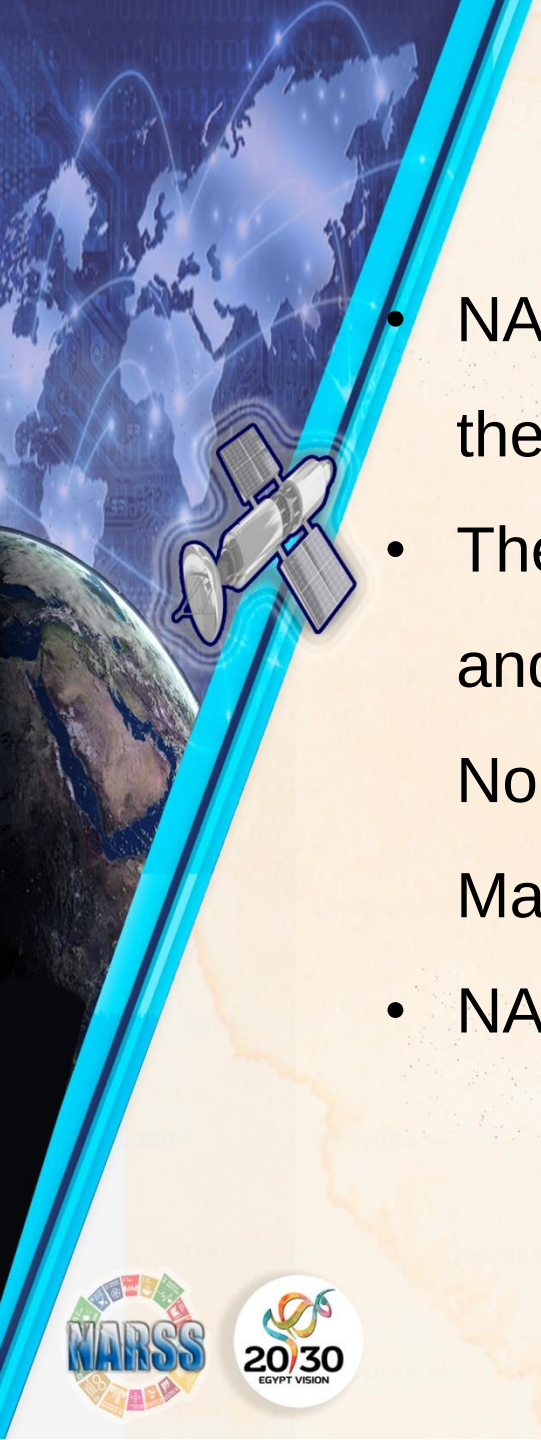


Introduction

- E-Station granted from EU and AUC through GMES and Africa Program for NAfCOAST project.
- NAfCOAST is a regional project funded by EU and AUC through GMES and Africa Program.
- It is mainly dedicated to build capacity and develop earth observation applications for societal benefits of the northern region of Africa and also to be well disseminated across the whole continent later on.
- Aiming at developing some valued coastal and marine services derived from earth observation data and other in-situ measurements integrated with thematic maps.

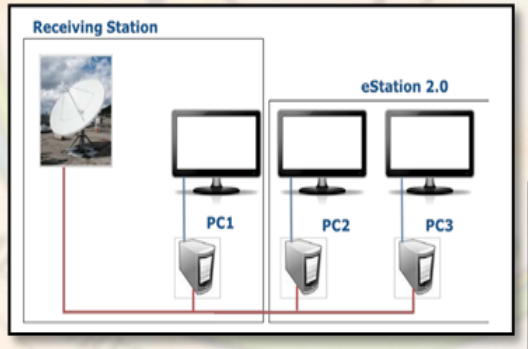


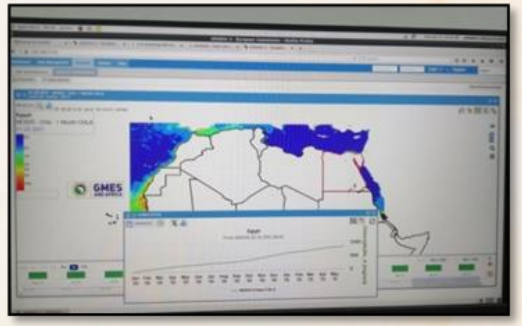
Introduction

- NAfCOAST has identified two main Services to be developed; including the mapping of oil spills and PFZ detection.
- The project is coordinated by the National Authority for Remote Sensing and Space Sciences, NARSS and has started with 3 partners from Northern Africa countries (CERT, Tunisia; UCD, Morocco; IMROP, Mauritania) in addition to regional organization of CEDARE.
- NARSS is the project lead

What is the E-Station?

- An Earth Observation processing system that includes hardware and software to receive, process and displays Earth Observation data for environmental monitoring and climate services.

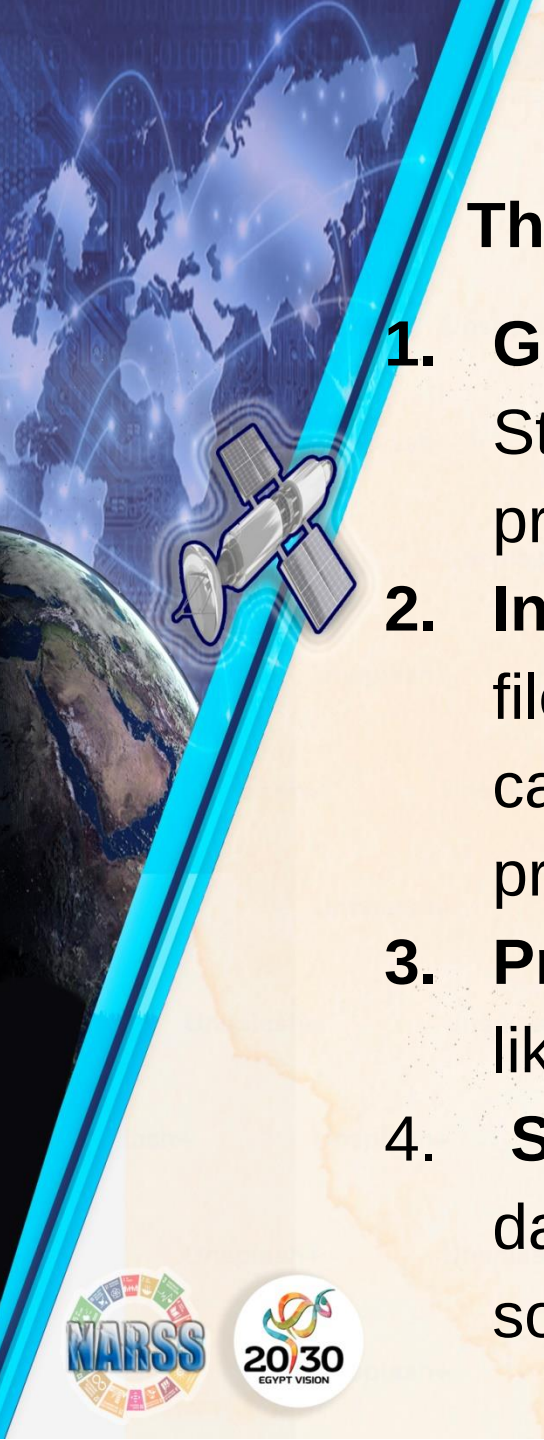




E-Station Function

The main purposes of the system are:

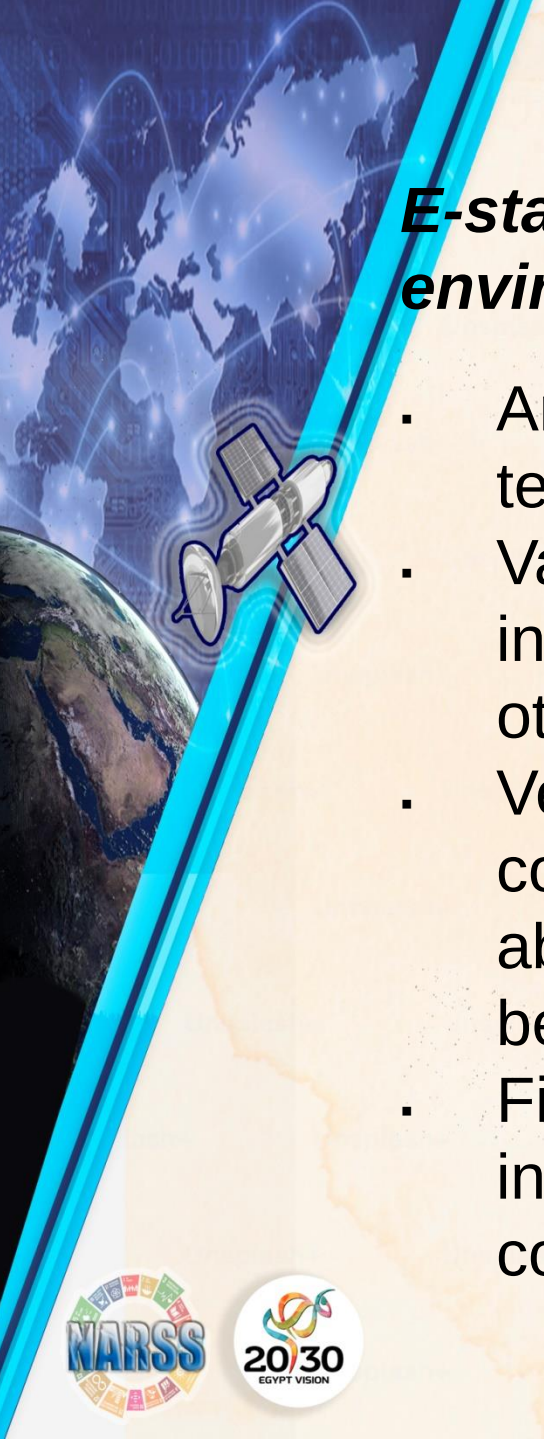
- Ensuring continuous reception of EO data, and support easy collection of missing data.
- Facilitating the post-processing and the link with other tools (e.g. QGIS, SPIRITS).
- Facilitating user interaction (UI rather than coding).
- Ensuring Hardware redundancy.
- Proposing customized functions for data analysis.



E-Station Services

The main purposes of the system are:

1. **Get Services**: systematically acquire EO data from PC1 (Receiving Station) and from remote servers, either through FTP or HTTP protocols.
2. **Ingestion Service**: convert the files from the format under which the files are acquired in (the so called ‘native’ format) into GeoTIFF, also called ‘pivot’ format. This operation includes geographical re-projection and clipping to a specific region of interest;
3. **Processing Service**: derive from the input data additional products, like long term statistics, anomalies, and other added-value indicators;
4. **System Service**: to run a number of tasks, including managing the data-synchronization between PC2 and PC3, the database backup, some monitoring and diagnostic operations



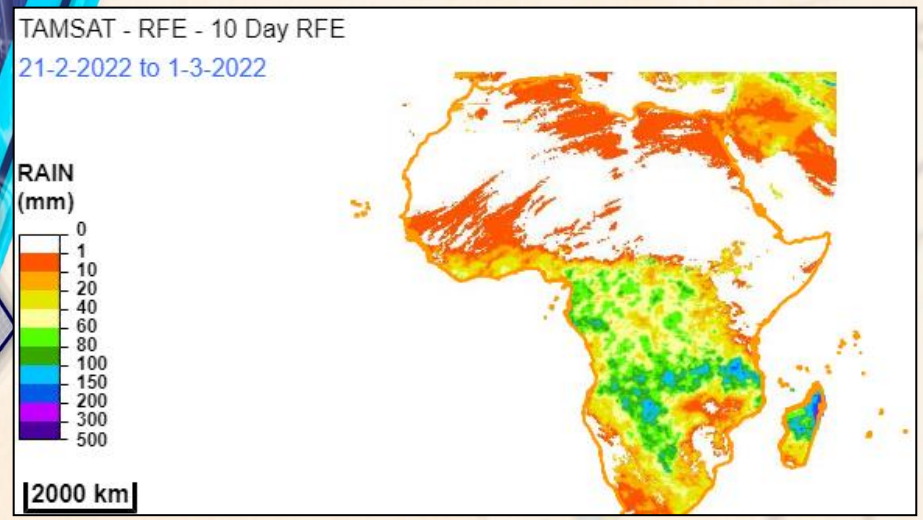
E-Station Applications

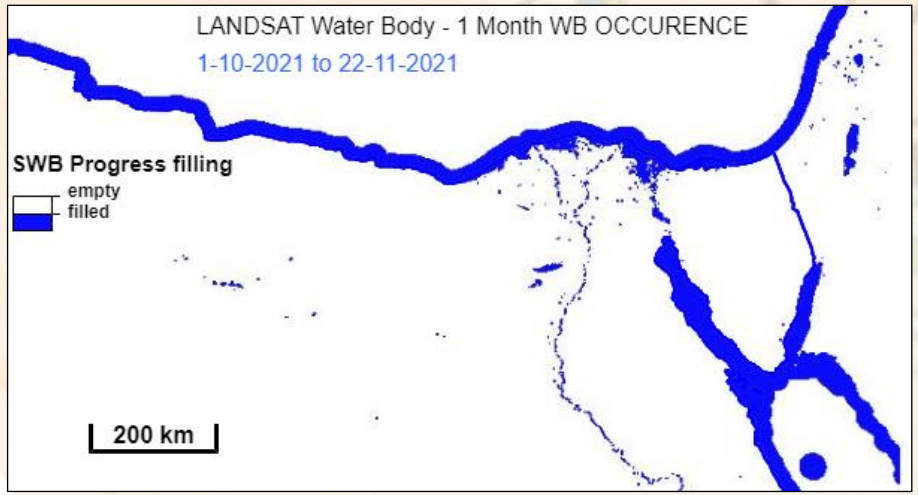
E-station products could be used in climate change and environmental studies such as:

- Analyzing the spatial and temporal variations in sea surface temperature to study the effect of climate change on sea temperature.
- Variations in rainfall over the continent would show also the impact of increasing temperature, some areas have high rainfall rate while other areas have low rain fall amount.
- Vegetation products including vegetation cover and soil moisture could be an indicator for the effect of climate of vegetation abundance, some areas would be at risk from high temperature and be exposed to drought and this affects on amount of vegetation.
- Fire data could be used to monitor the forest fires which have increased recently in different regions over the world as a consequence of climate change.

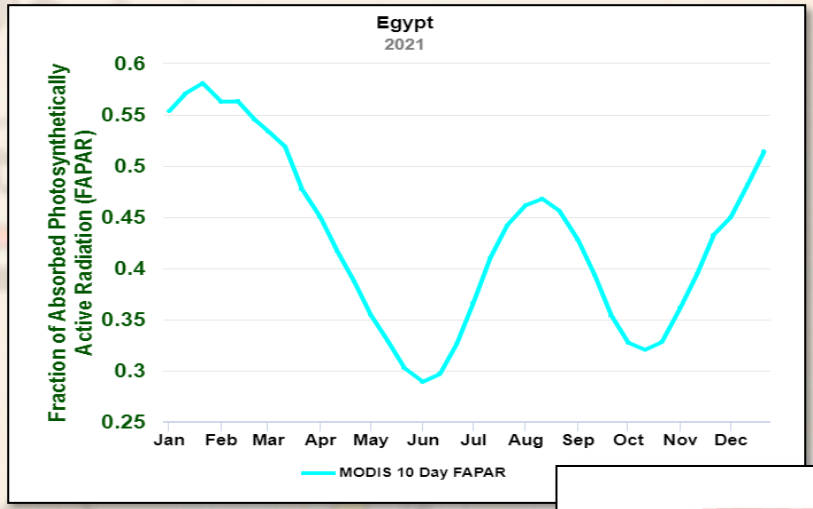
E-Station Products Formats

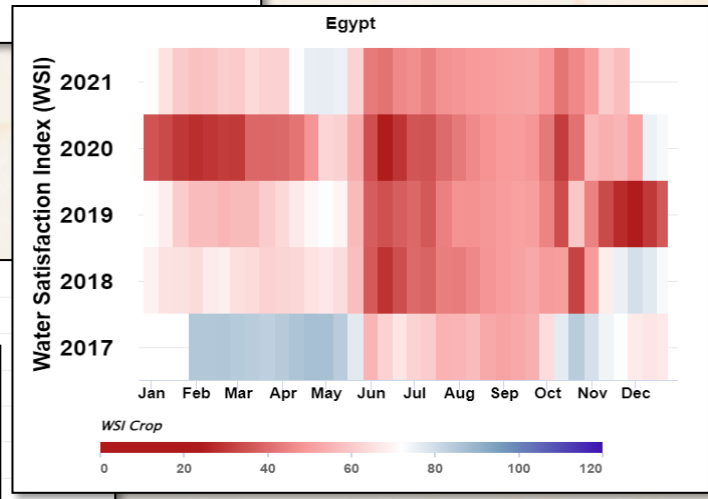
Maps

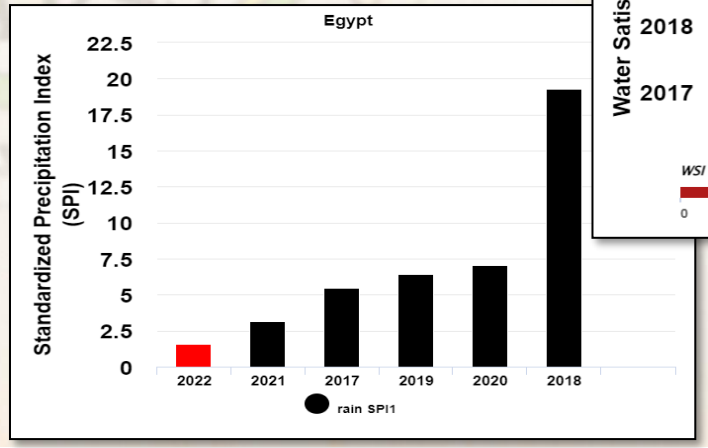




Plots & Figures

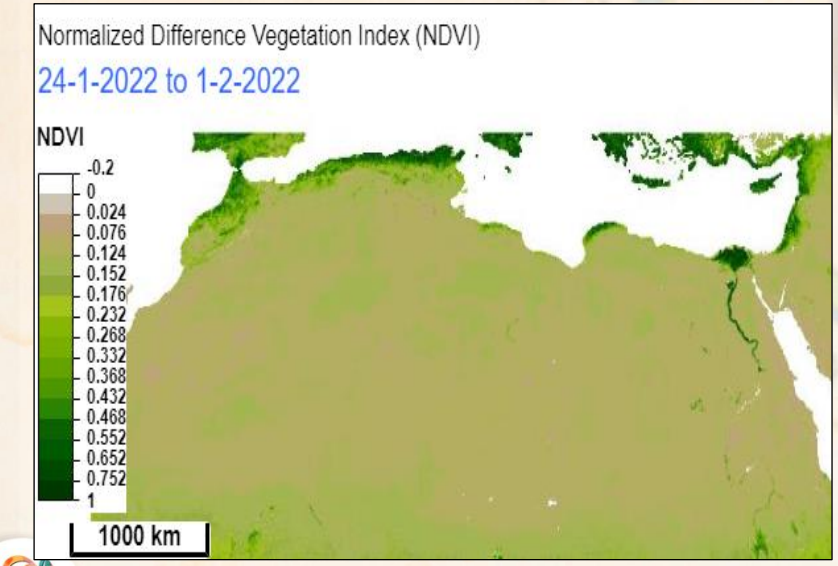


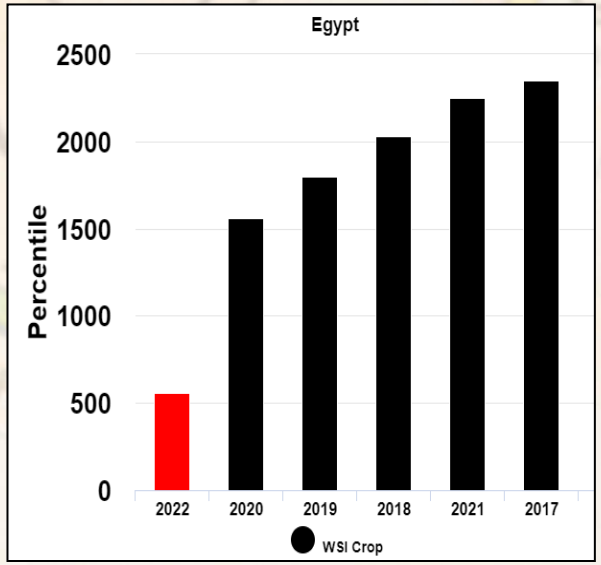


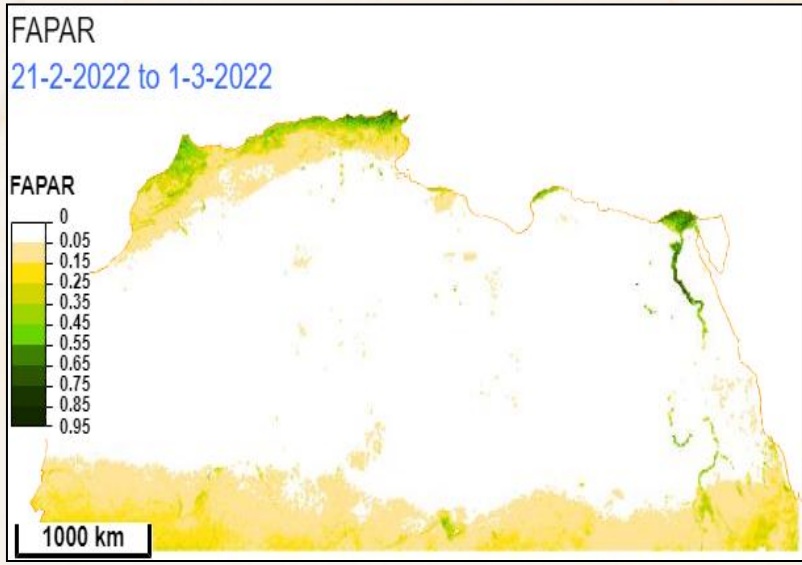


E-Station Available Products

Category	Products	Data Source
Vegetation	Water Satisfaction Index	JRC/MARS
	Fraction of Absorbed Photosynthetically Active Radiation (FAPAR)	MODIS
	Normalized Difference Vegetation Index (NDVI)	Sentinel 3

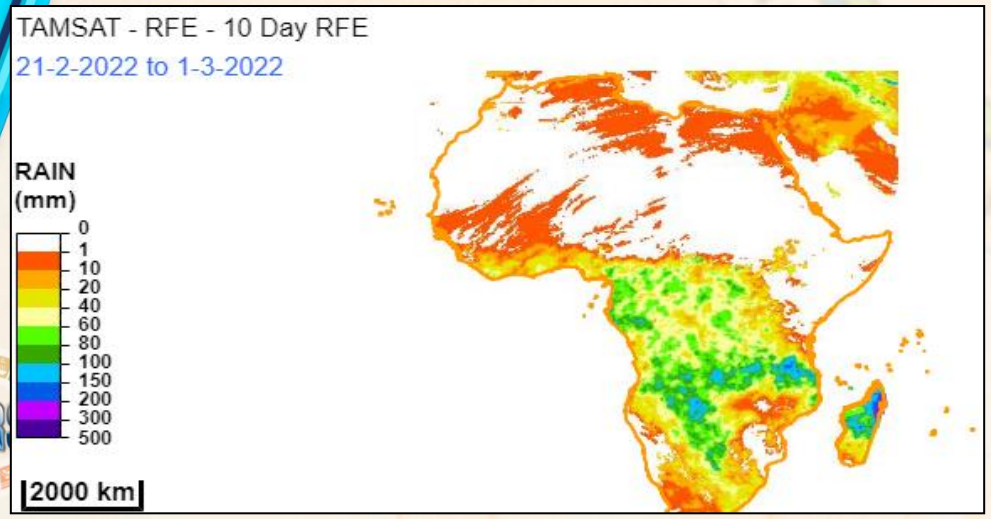


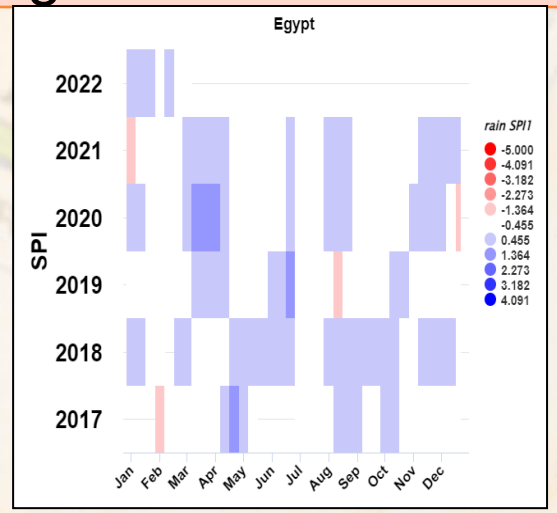


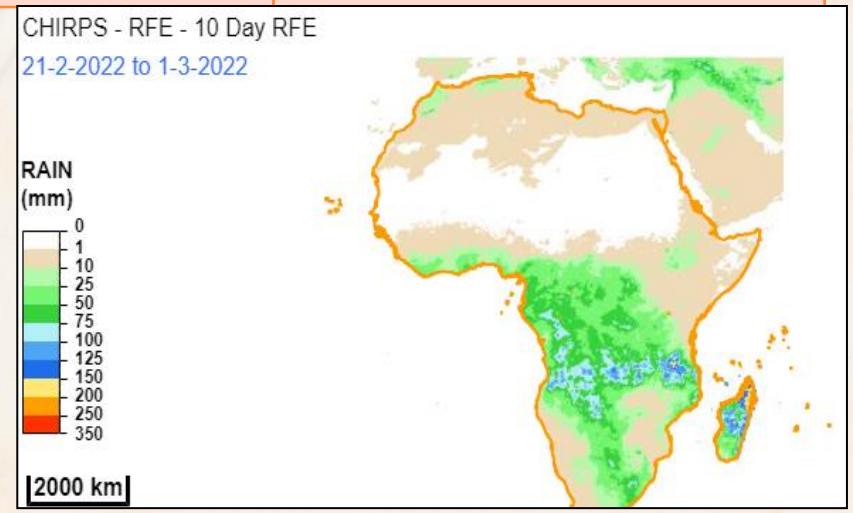


E-Station Available Products

Category	Products	Data Source
Rainfall	African Rainfall Climatology	ARC2 /MODIS
	The Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS)	CHIRPS /MODIS
	Famine Early Warning Systems Network (FEWS NET)	FEWS /MODIS
	The Standardized Precipitation Index (SPI)	JRC/MODIS
	TAMSAT RAIN The Tropical Applications of Meteorology using Satellite data and ground-based observations	TAMSAT/MODIS

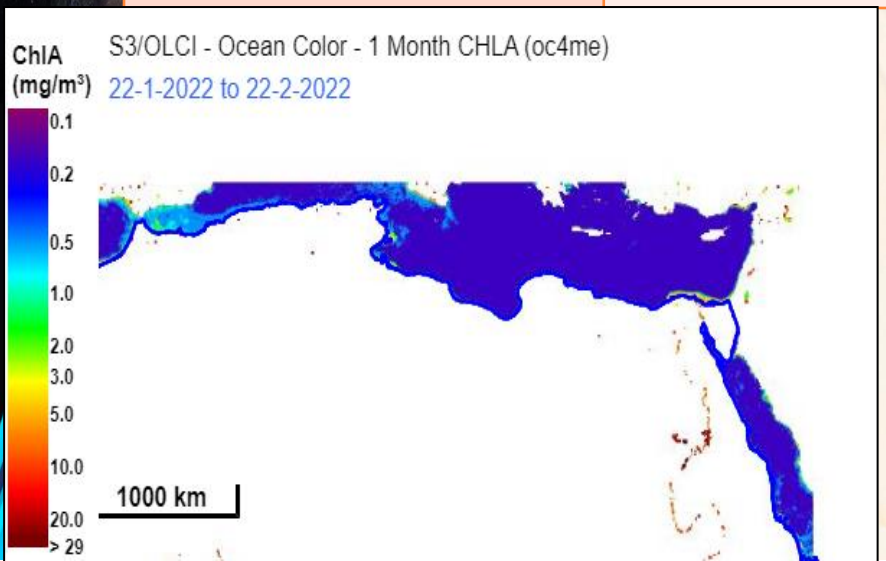


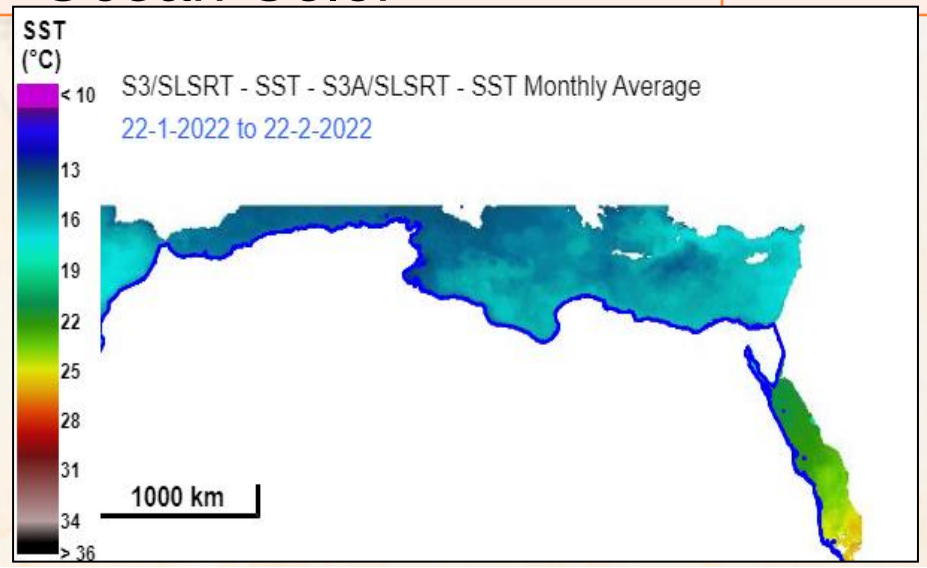


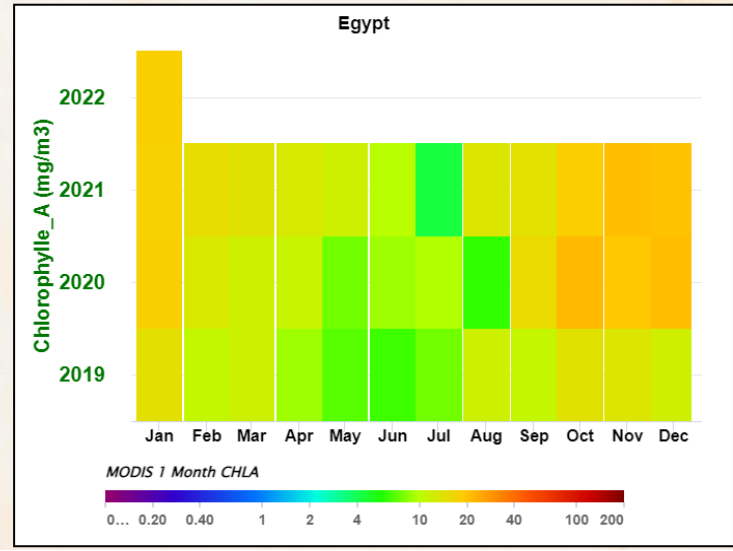


E-Station Available Products

Category	Products	Data Source
Oceanography	Chlorophyll Concentration	MODIS, (PML) Plymouth Marine Laboratory
	Water Transparency Kd490 indicates the turbidity of the water Colum	MODIS
	Sea Surface Temperature (SST)	MODIS, Sentinel3, PML
	phytoplankton primary productivity	MODIS
	(PAR) Photosynthetically Active Radiation	MODIS
	Ocean Color	Sentinel3

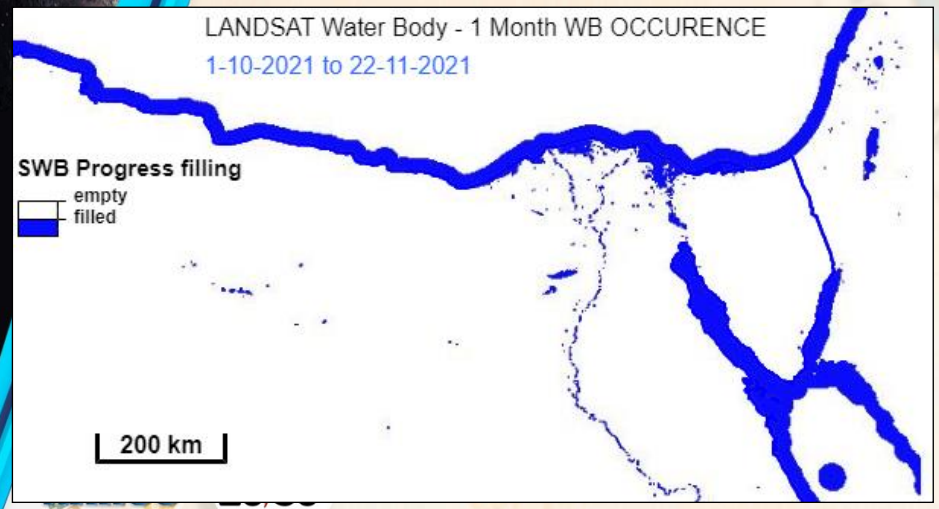


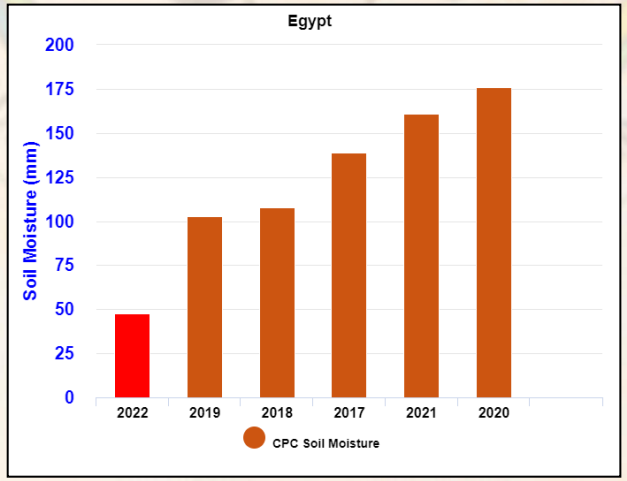


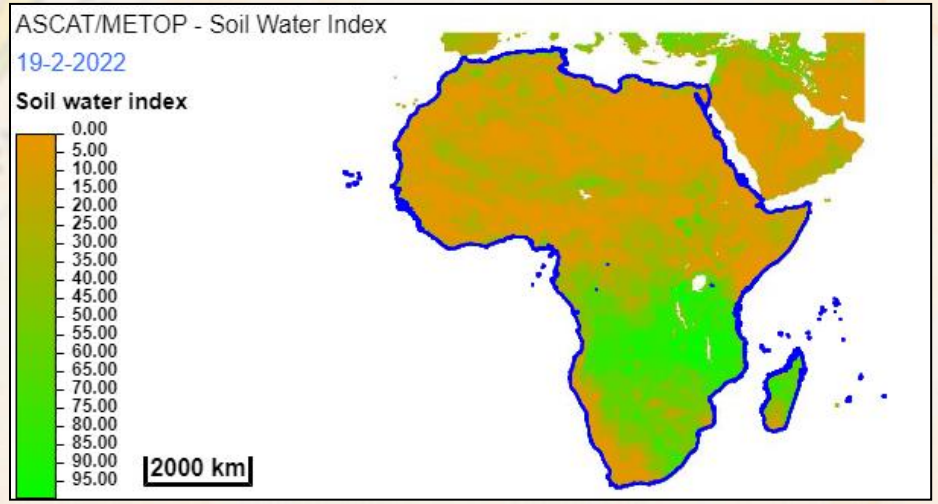


E-Station Available Products

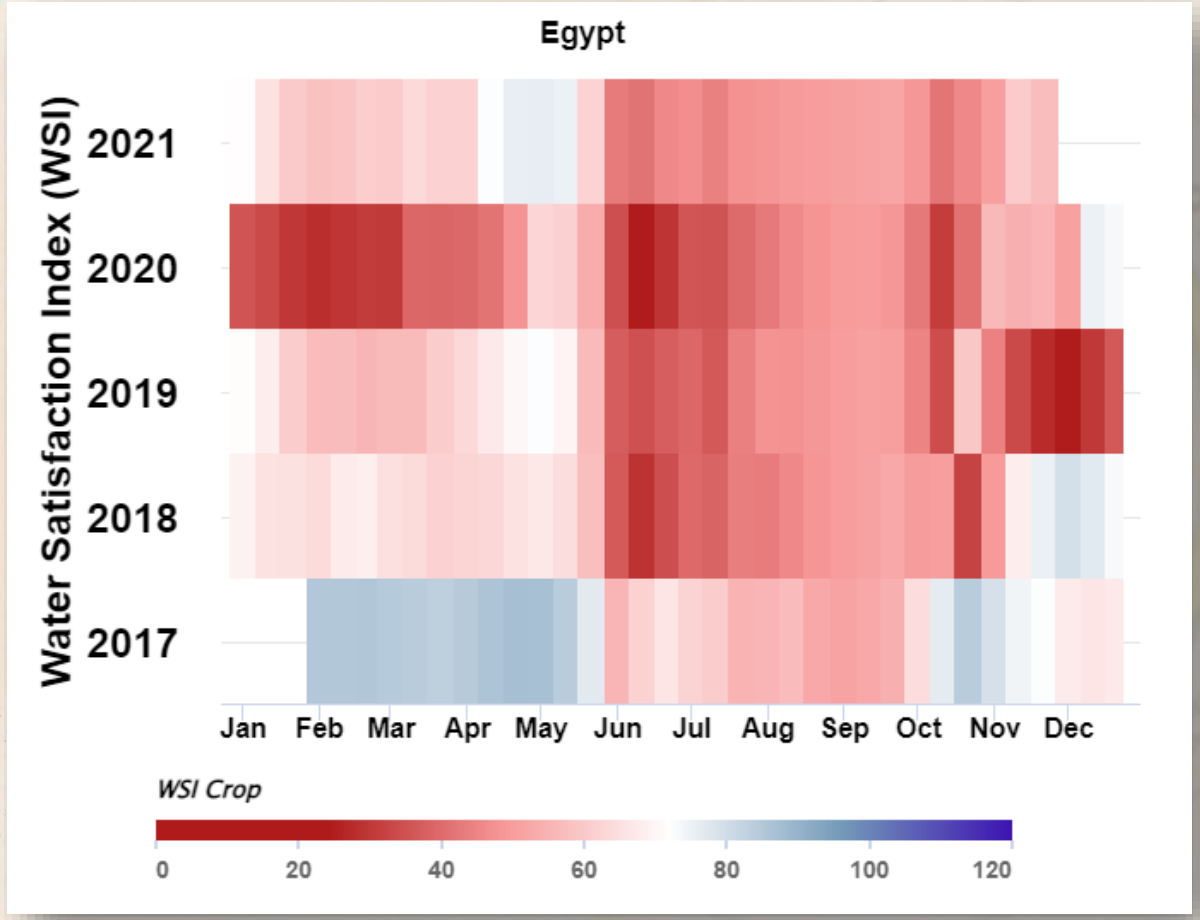
Category	Products	Data Source
Inland Water	Water Bodies Detection	Landsat/MODIS
Fire	Sum composite of the active fire	MODIS, SPOT
Miscellaneous	Soil Water Index	ASCAT / MODIS
	Soil Moisture	Climate Prediction Center (CPC)/ MODIS

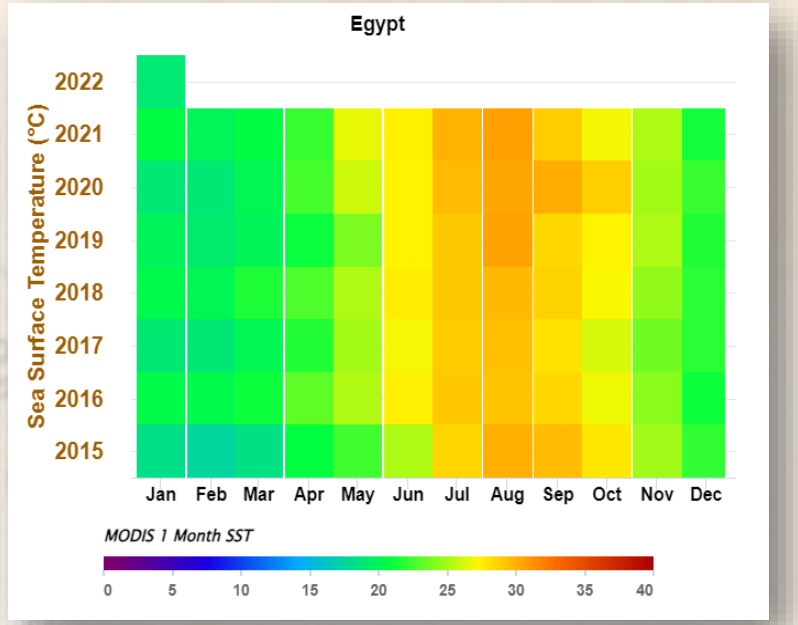


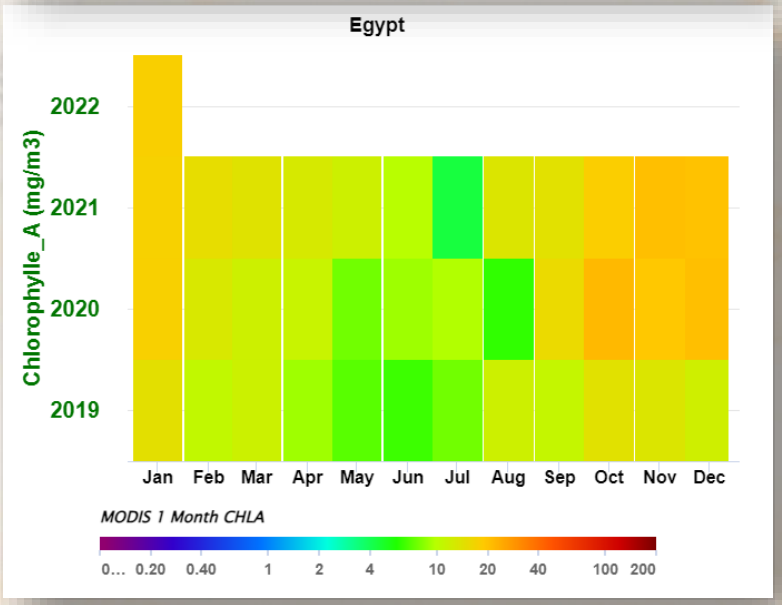




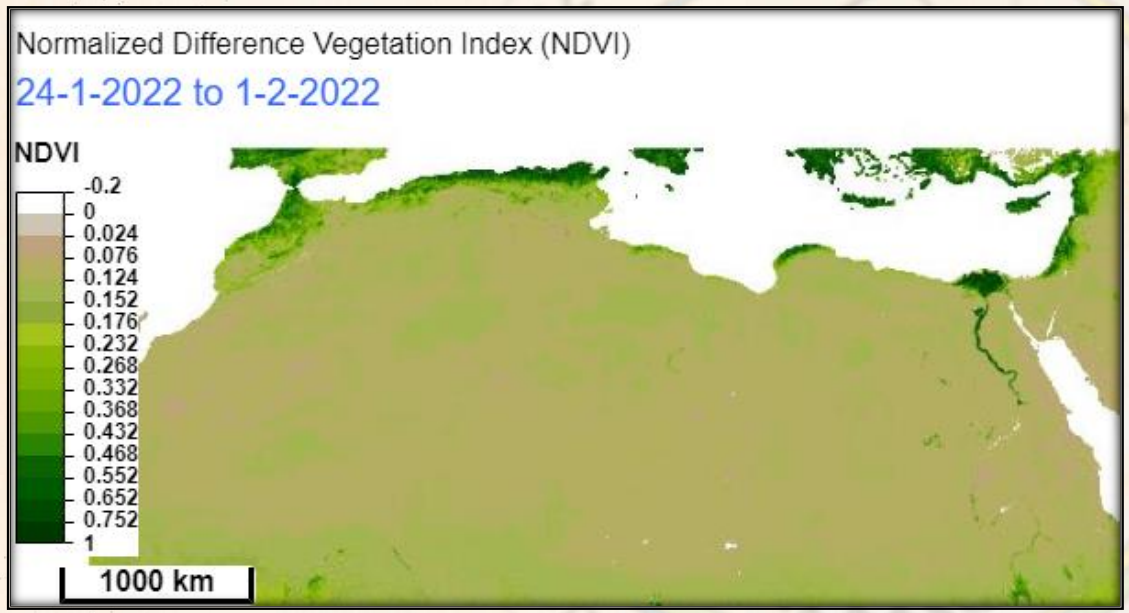
E-Station Outcomes (National Scale)

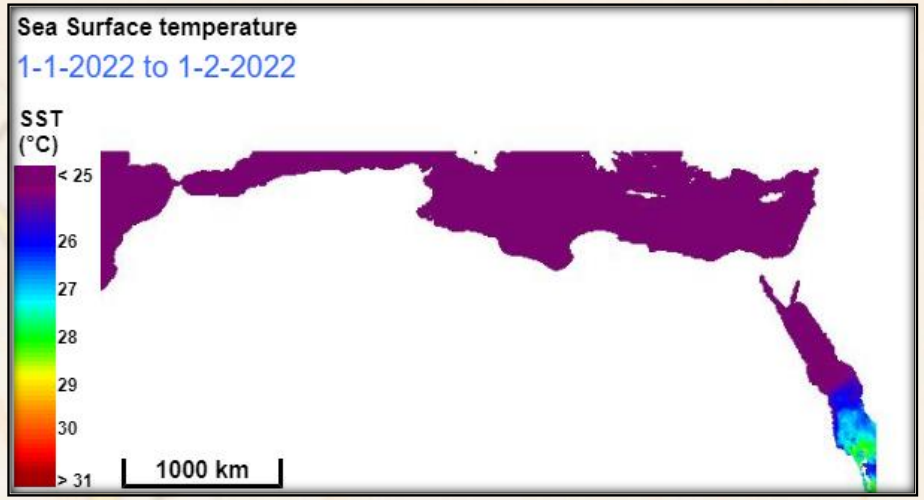


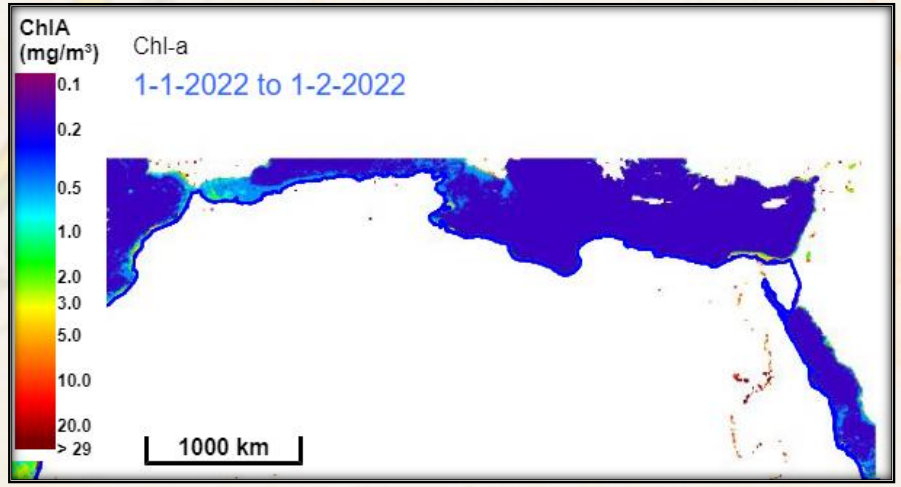




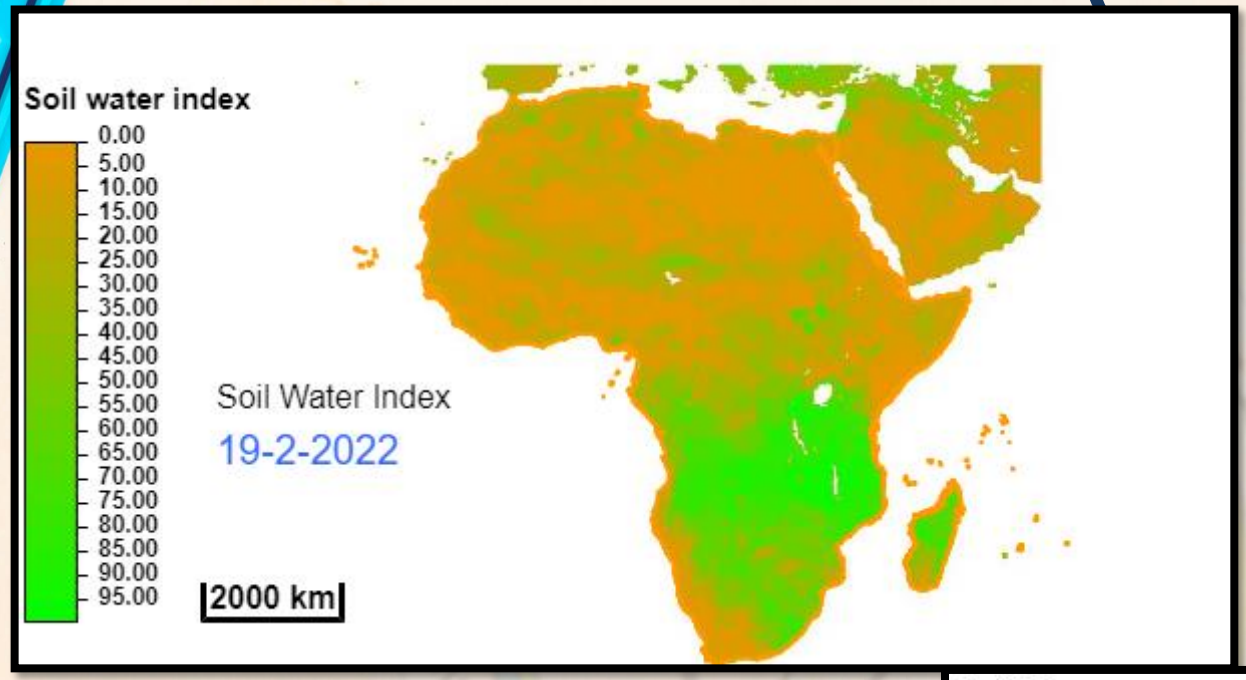
E-Station Outcomes (Regional Scale)

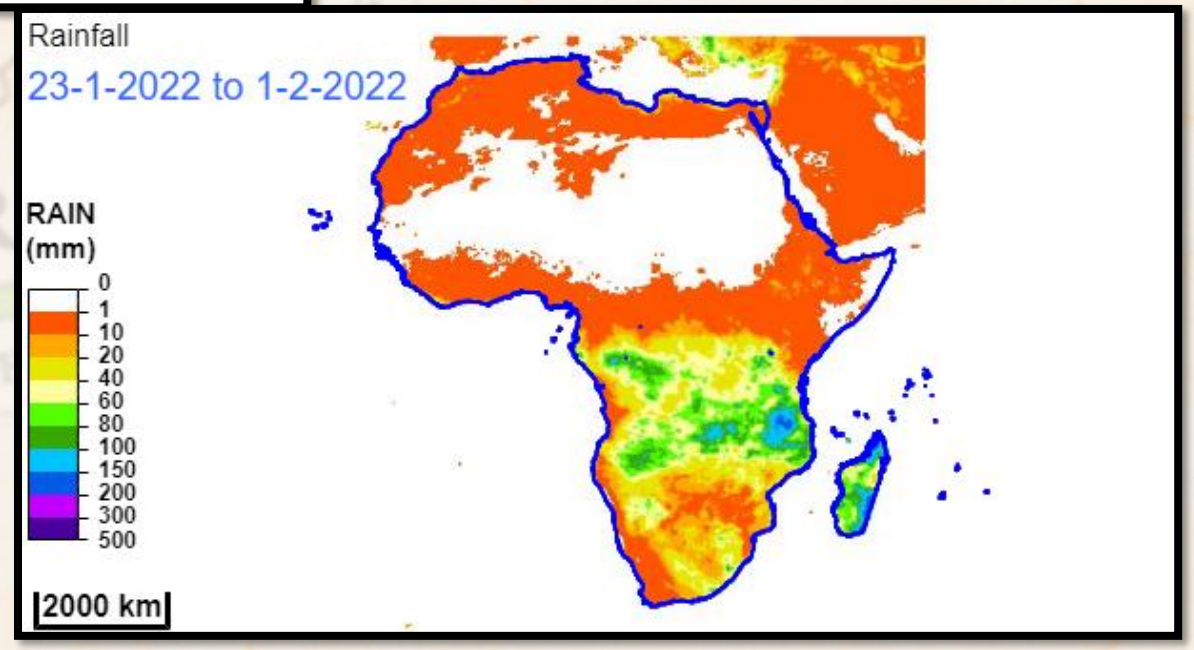






E-Station Outcomes (Continental Scale)





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