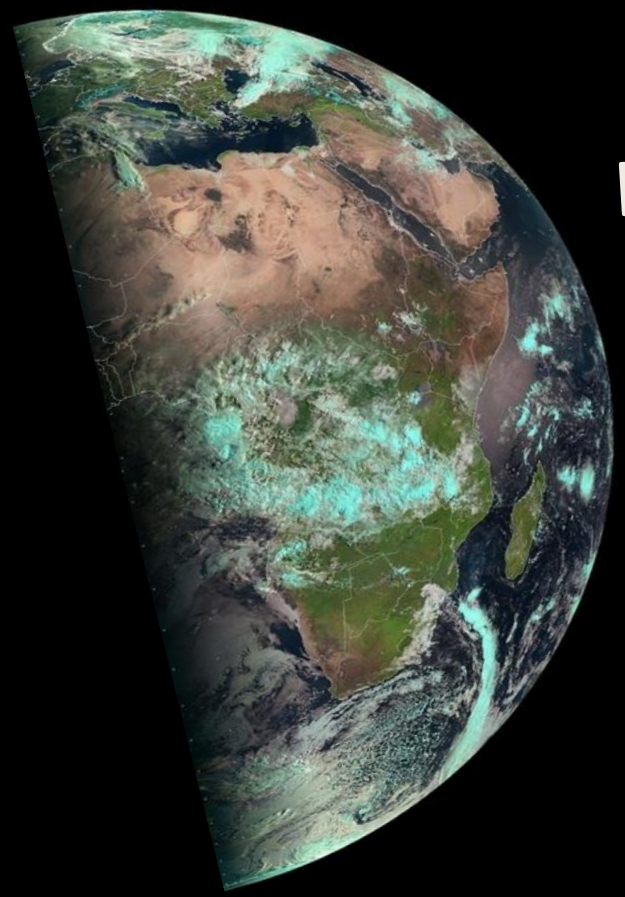
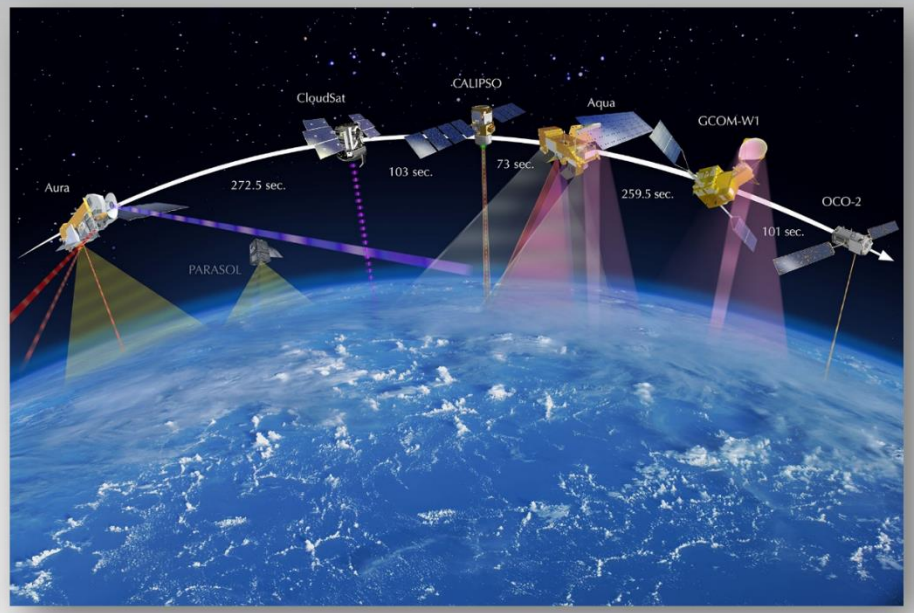


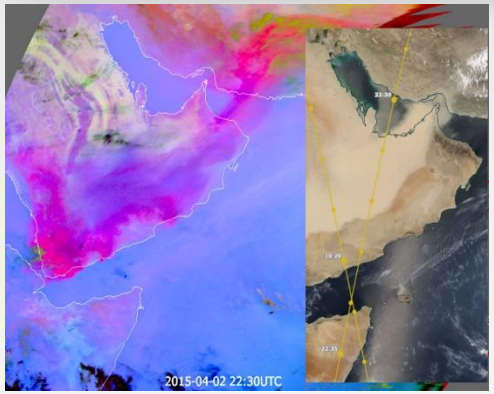
Weather Satellite

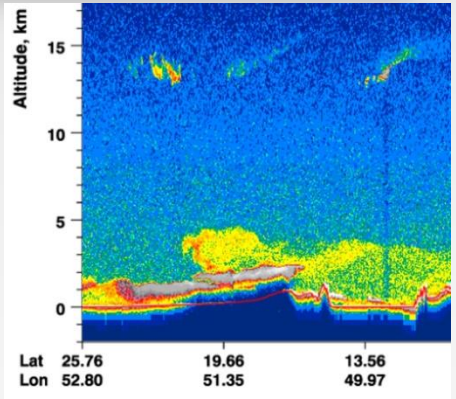
Web Based Visualization and Data Centers

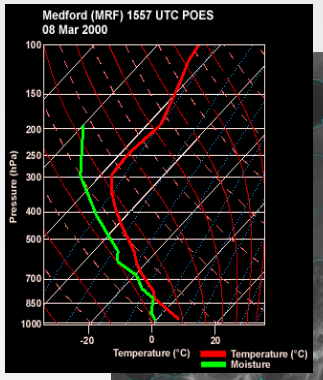
Ibrahim Al Abdulsalam
i.alabdulsalam@met.gov.om

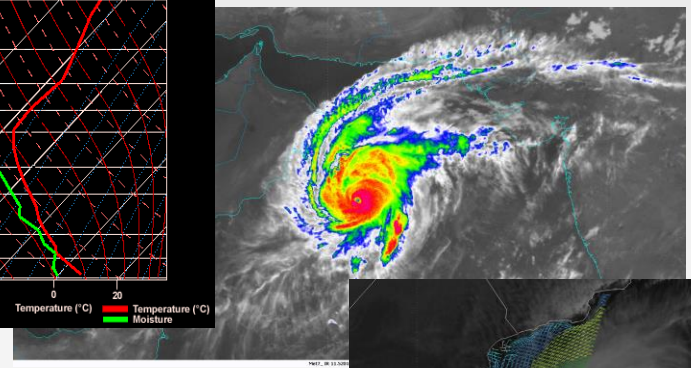
Nowadays Satellite Remote Sensing

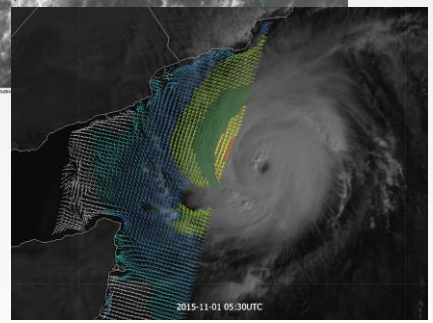


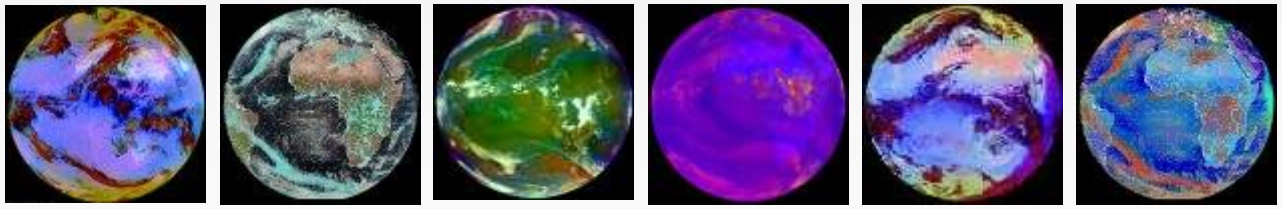




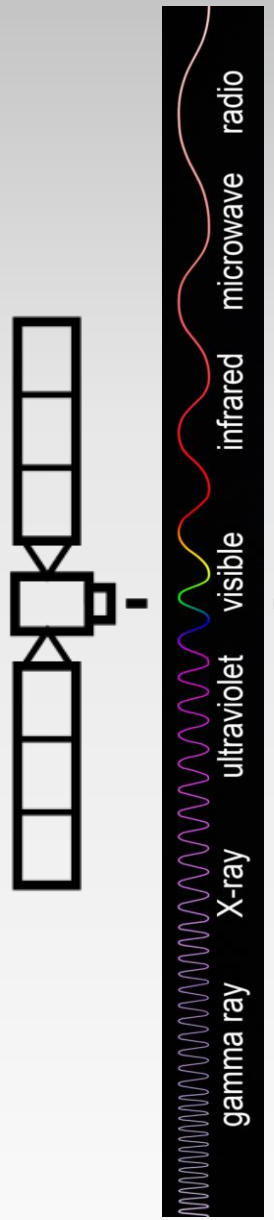






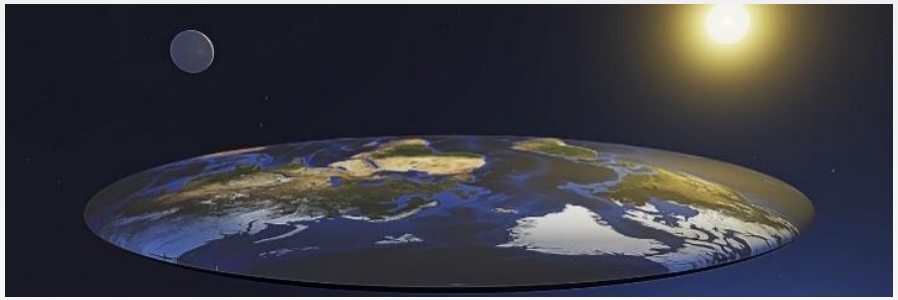


Nowadays Satellite Remote Sensing



Towards Physical Reality

More improvement in :
*Observation
*Science
*Methods to process and visualize data
*Accuracy
*Correction
*Calibration
.
.



What we have and what we need?

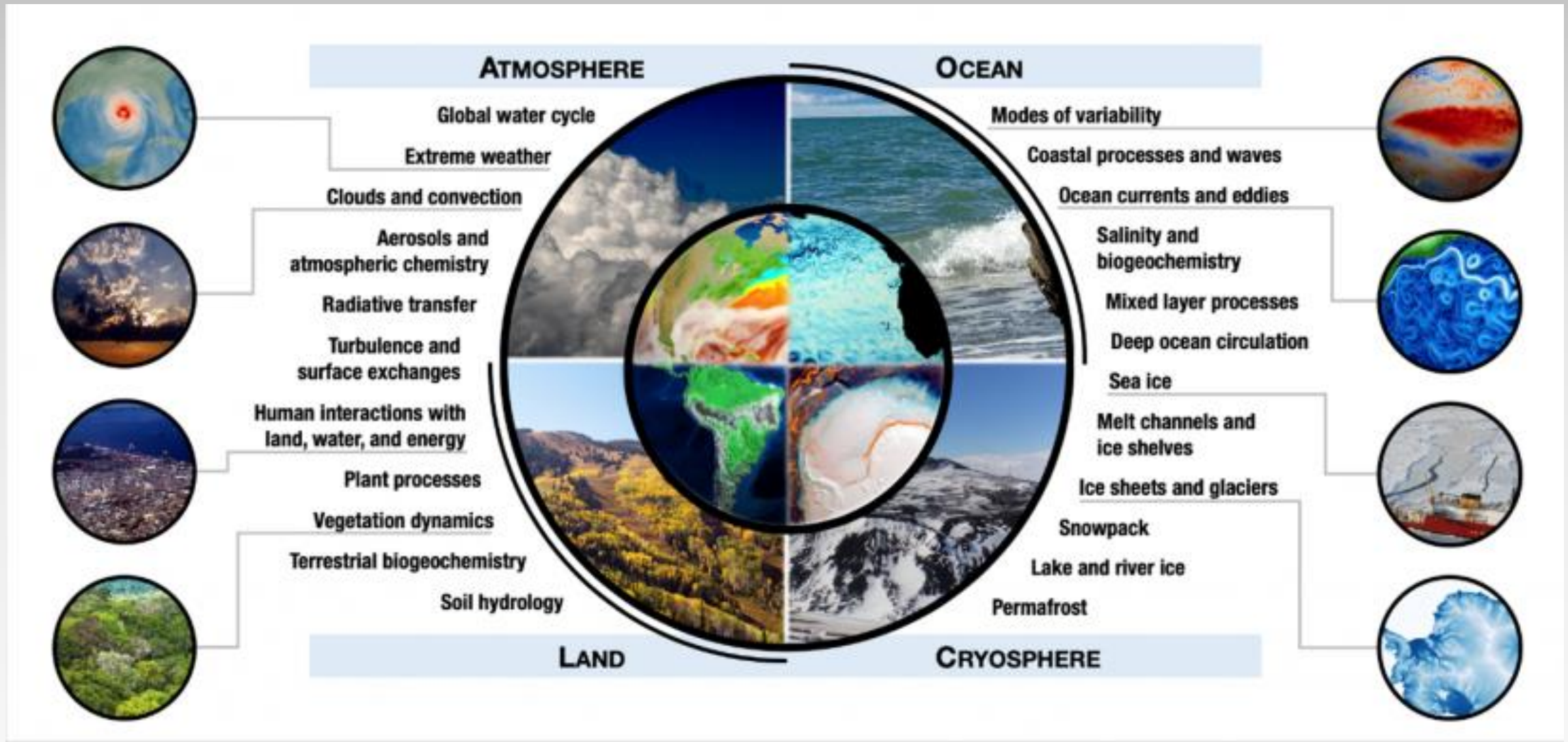
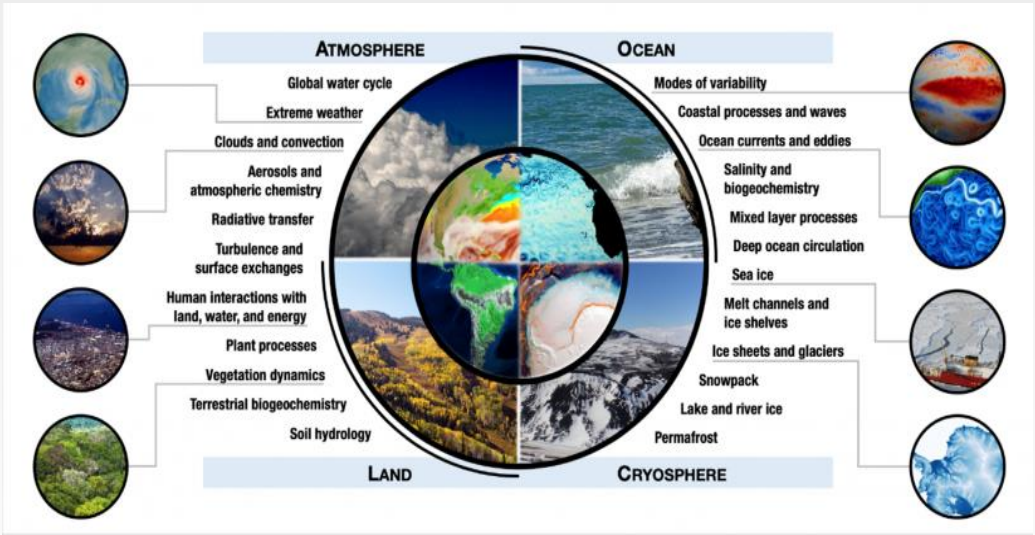


Image courtesy of Paul Ullrich, University of California, Davis

Use of Electromagnetic Wave

Anything in the Earth system and its atmosphere :

Emit, reflect , scatter or interact with electromagnetic waves at different wavelength and in many different ways relative to its physical states, processes, motions, chemistry, composition ……etc



Satellites

observe electromagnetic waves

Processing and Visualization

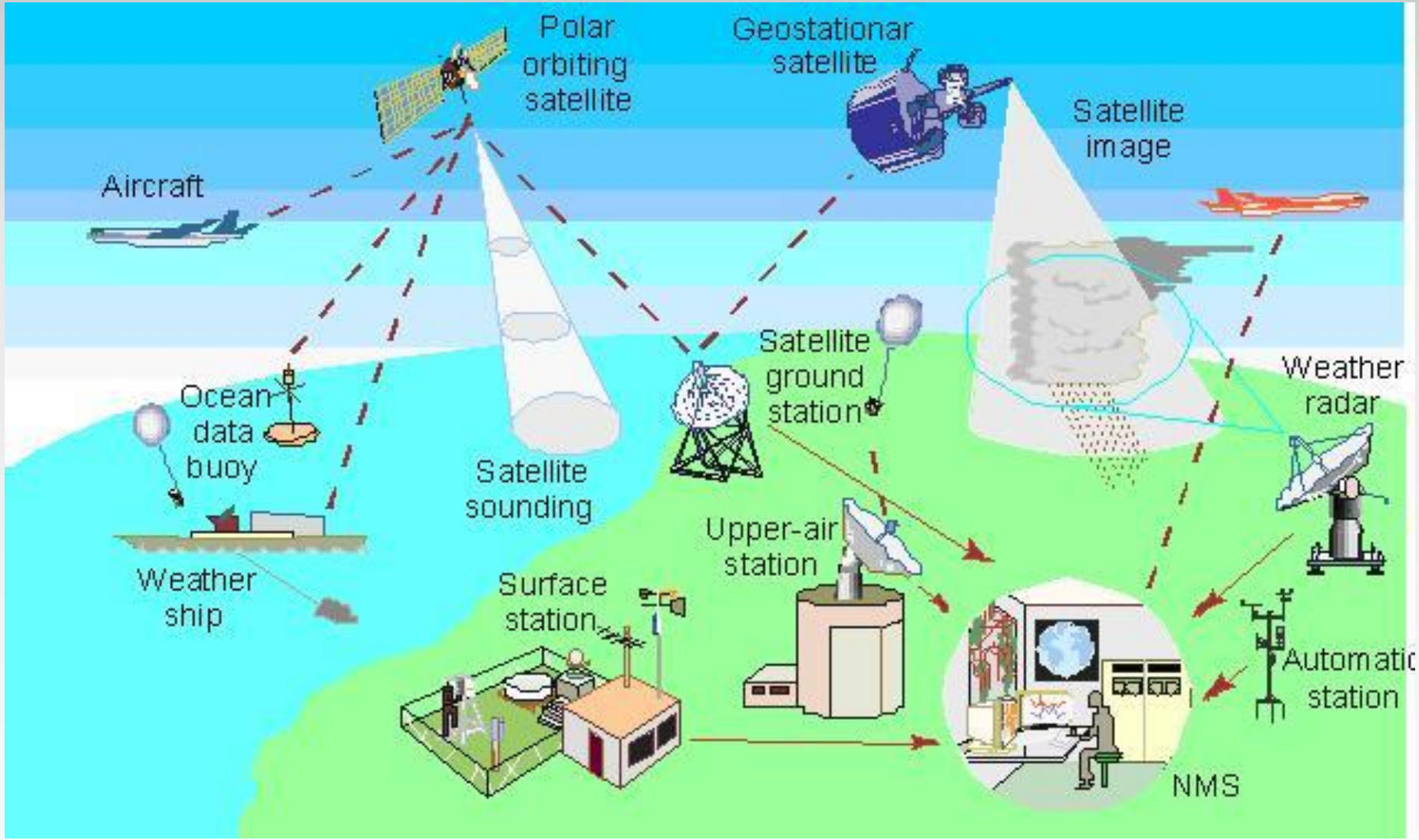
observation is translated to data and images revealing the physical states, processes, motions, chemistry, compositions ……etc

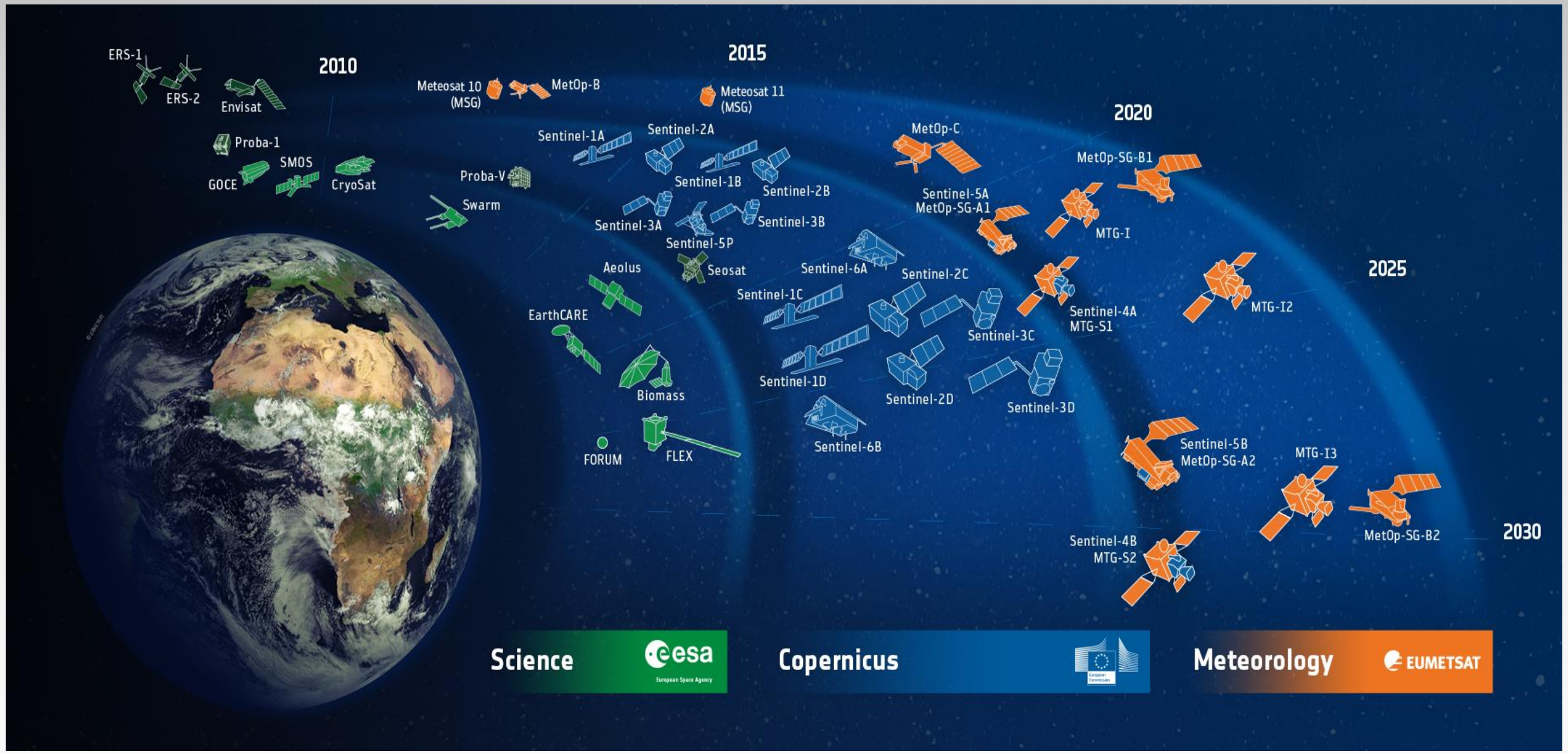
Products of Higher Level

AI , Machine learning ,NWP and Numerical analysis and Reanalysis

- Correction
- Calibration
- New methods and techniques
-

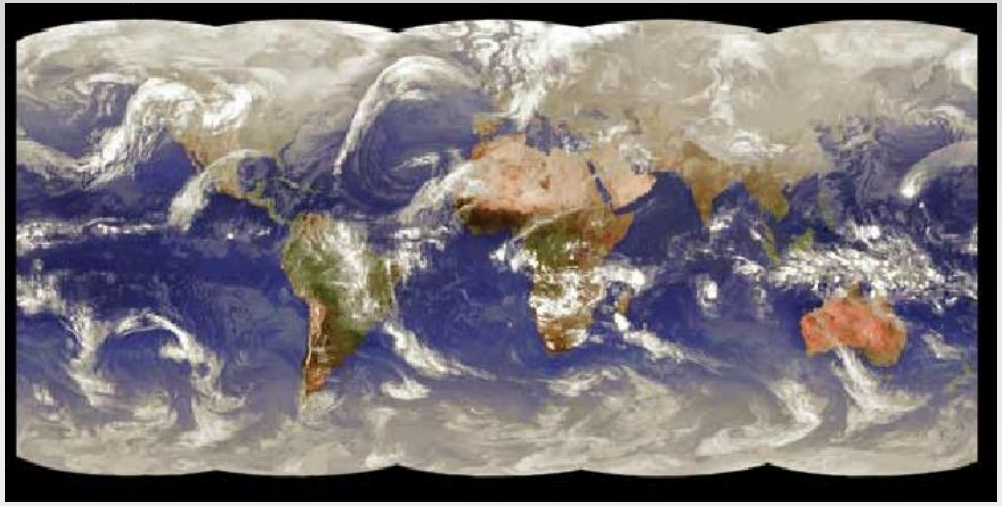
Weather Observation and Forecasting Systems



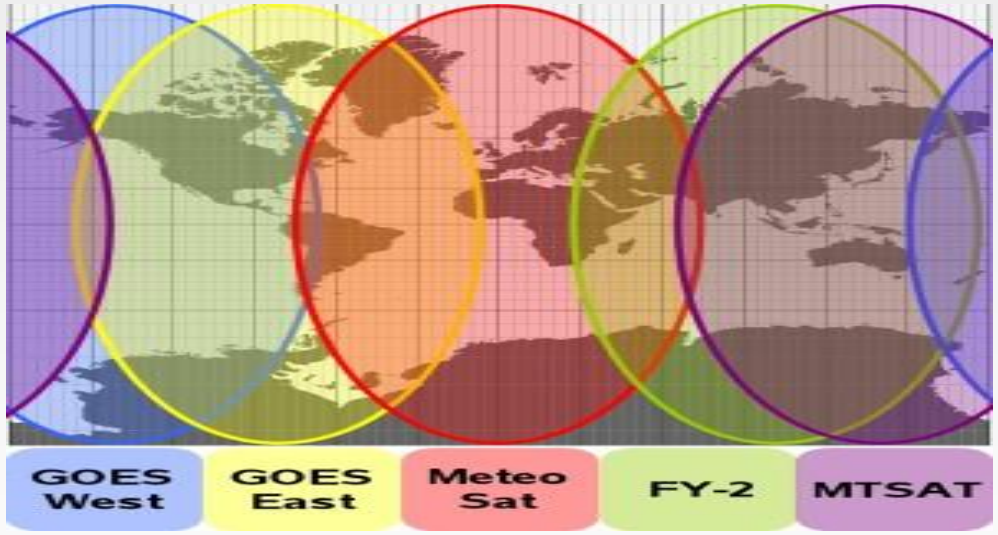

2010
ERS-1
ERS-2
Envisat
Proba-1
SMOS
GOCE
CryoSat
2015
Meteosat 10 (MSG)
MetOp-B
Meteosat 11 (MSG)
Sentinel-1A
Sentinel-2A
Sentinel-1B
Sentinel-2B
Proba-V
Swarm
Sentinel-3A
Sentinel-3B
Sentinel-5P
Aeolus
Seosat
Sentinel-6A
Sentinel-1C
Sentinel-2C
EarthCARE
Sentinel-3C
Sentinel-1D
Sentinel-2D
Biomass
Sentinel-3D
FORUM
FLEX
Sentinel-6B
2020
MetOp-C
MetOp-SG-B1
Sentinel-5A
MetOp-SG-A1
MTG-I
Sentinel-4A
MTG-S1
2025
MTG-I2
Sentinel-5B
MetOp-SG-A2
MTG-I3
MetOp-SG-B2
2030
Sentinel-4B
MTG-S2
Science
esa
European Space Agency
Copernicus
Meteorology
EUMETSAT

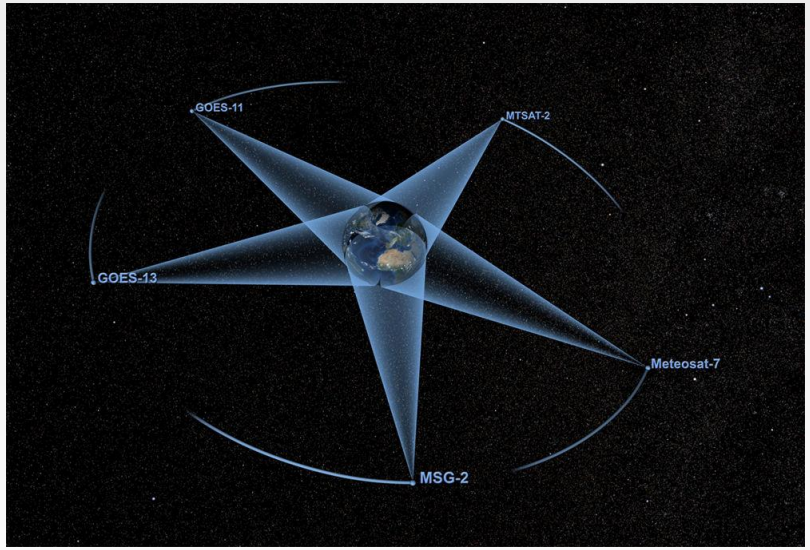
Geostationary

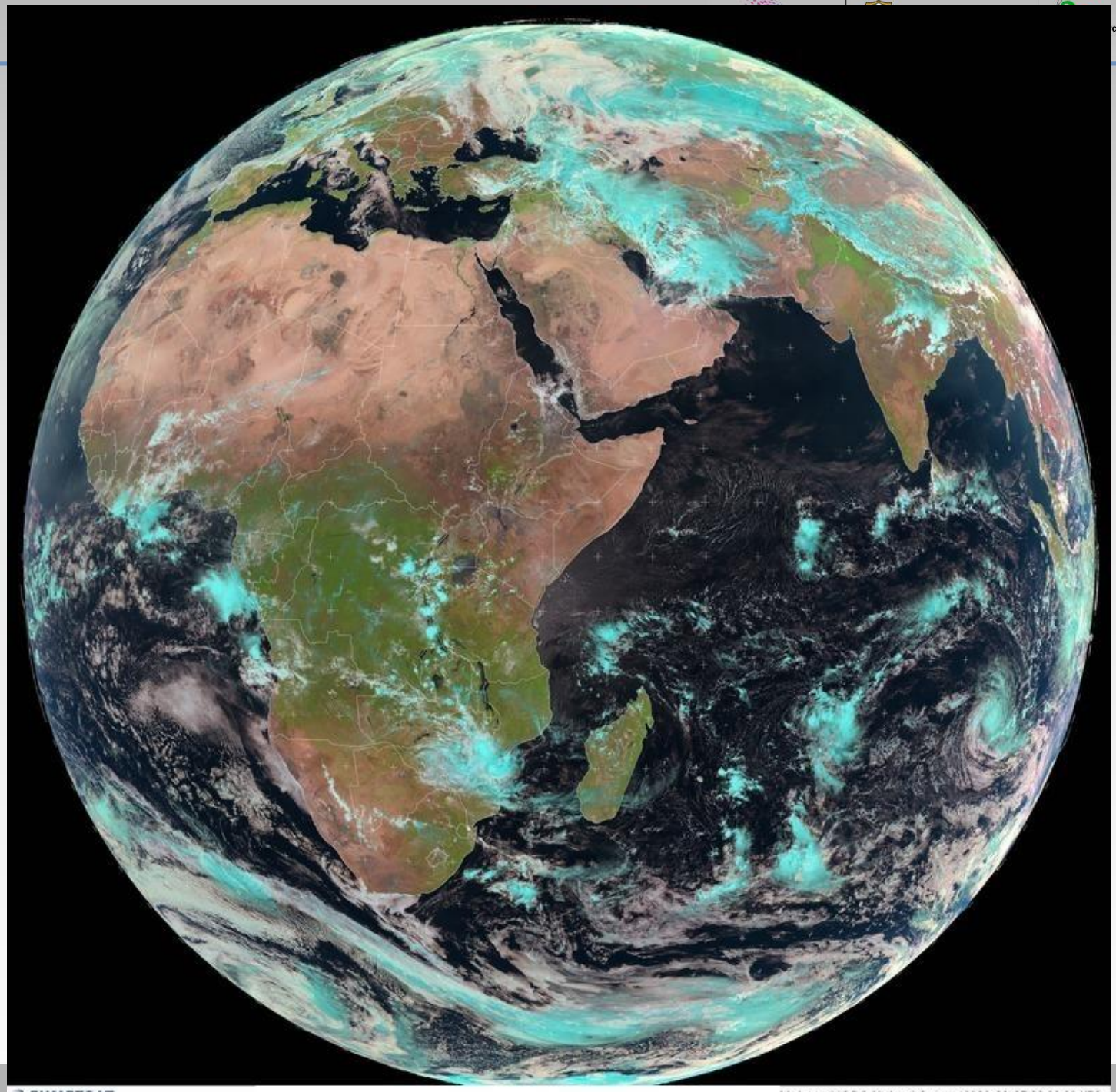
Satellite coverage



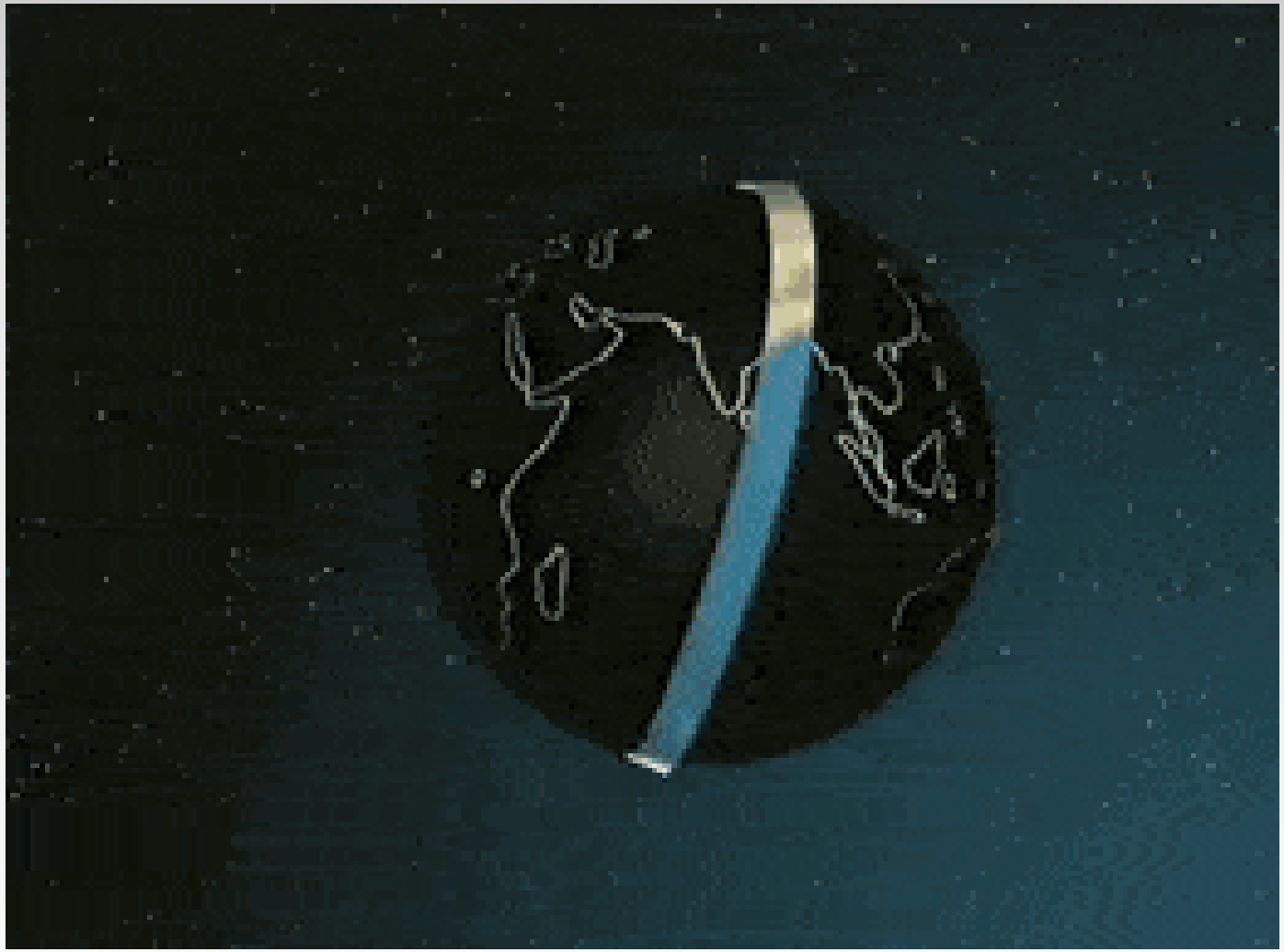
Geostationary





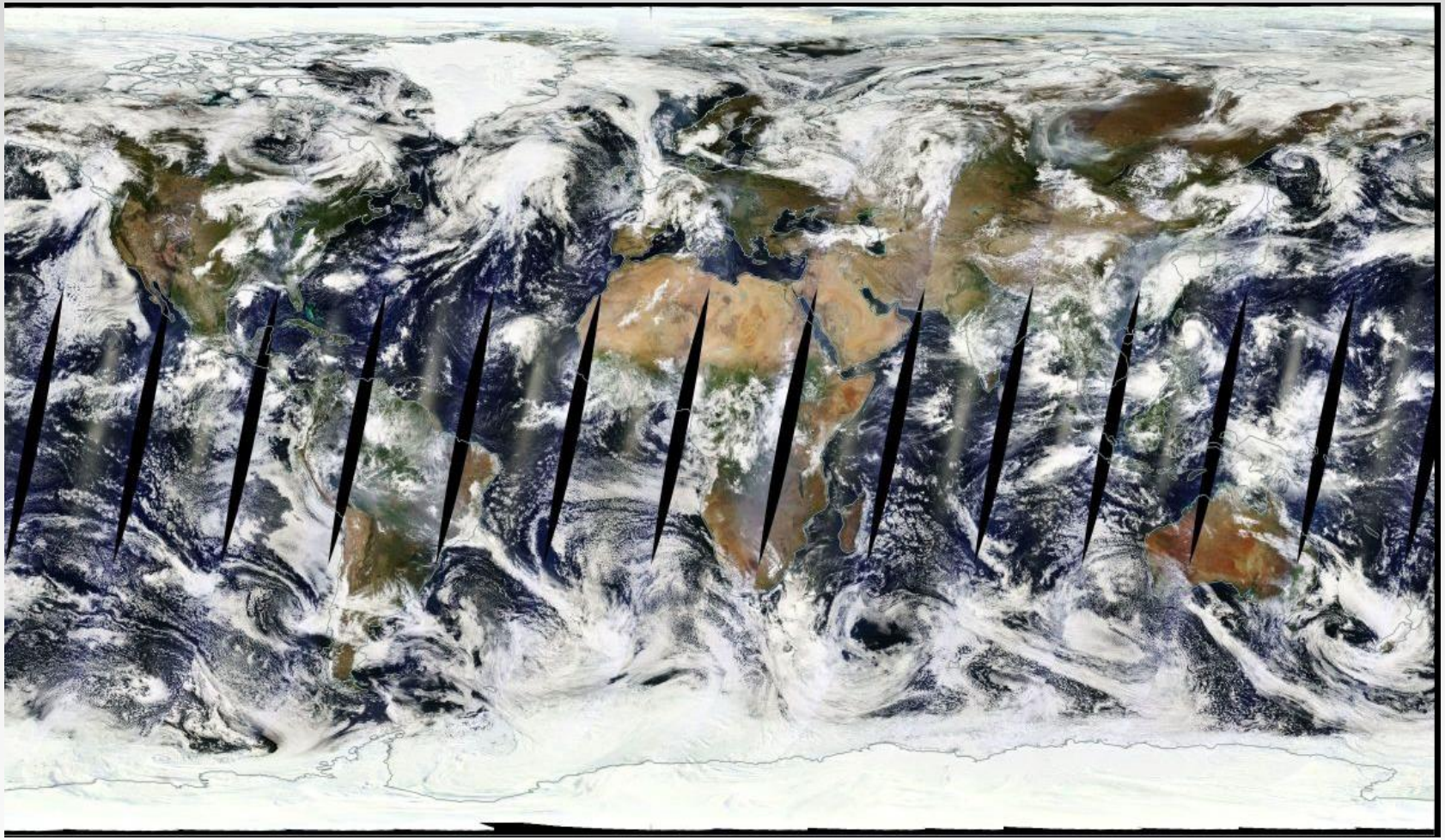


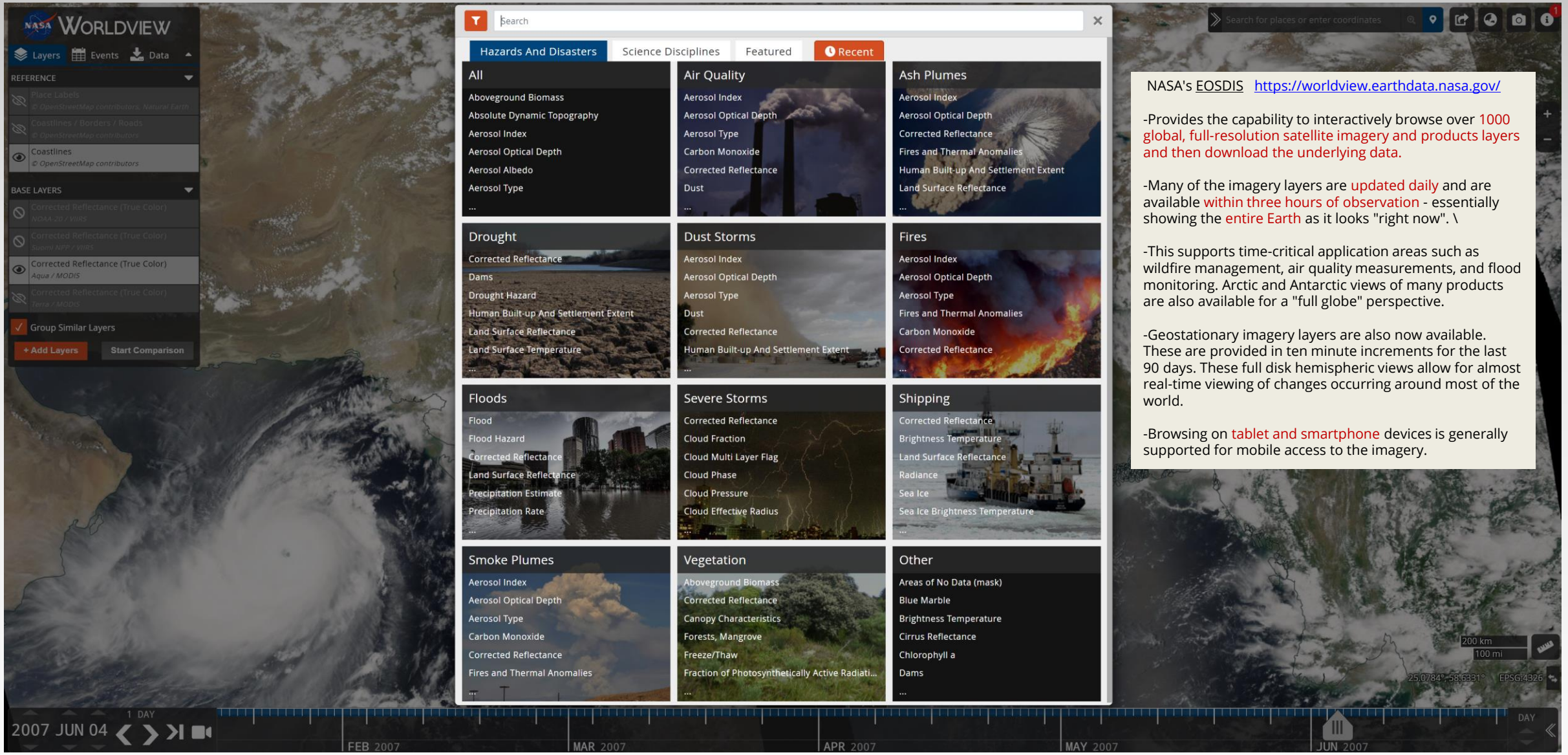
Polar Orbiting Satellite



Satellite coverage

One Polar Orbiting Satellite





NASA's EOSDIS https://worldview.earthdata.nasa.gov/

-Provides the capability to interactively browse over 1000 global, full-resolution satellite imagery and products layers and then download the underlying data.

-Many of the imagery layers are updated daily and are available within three hours of observation - essentially showing the entire Earth as it looks "right now". \

-This supports time-critical application areas such as wildfire management, air quality measurements, and flood monitoring. Arctic and Antarctic views of many products are also available for a "full globe" perspective.

-Geostationary imagery layers are also now available. These are provided in ten minute increments for the last 90 days. These full disk hemispheric views allow for almost real-time viewing of changes occurring around most of the world.

-Browsing on tablet and smartphone devices is generally supported for mobile access to the imagery.

We will Look at:

-TC Formation and Development
-True color image
-Brightness Temperature
-Satellite Track

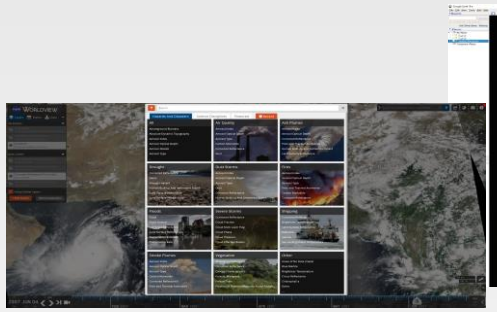
TC intensity Estimation
-SACTON
-Compare Mekuno And Kayarr
-Use Google earth to plot locations
-QGIS plot location and images
- TC historic best track over Arabian Sea

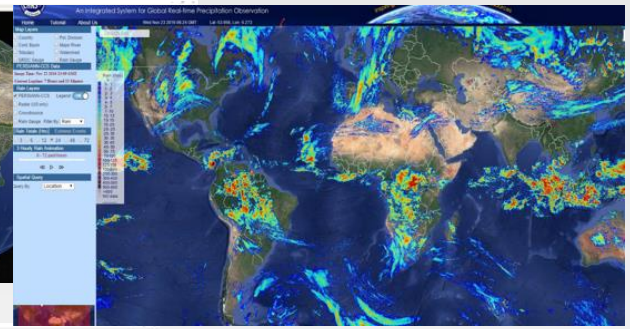
TC Flash Floods and Its impacts, Soil Moisture

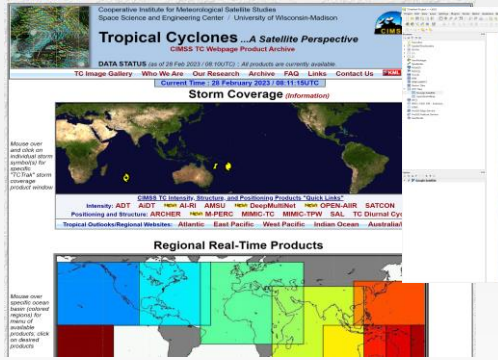
- Case of Flash Flood over Pakistan
-CHRS update

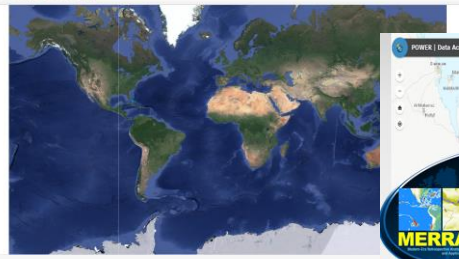
-Sea Surface Temperature
-Compare SST before and After TC Mekonu
-See Also TC Kyarr 2019 Oct 28

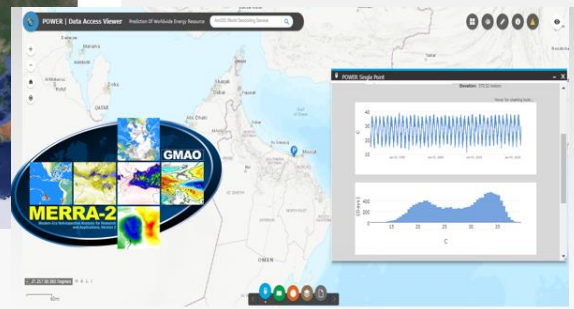
Look at the SST Globally / Seasonally
- Global distribution of sea surface heat
- Sea Current impacts
- Cold fronts impact over the Gulf water
- Monsoon impact 20 July 2018
- TC Shaheen !





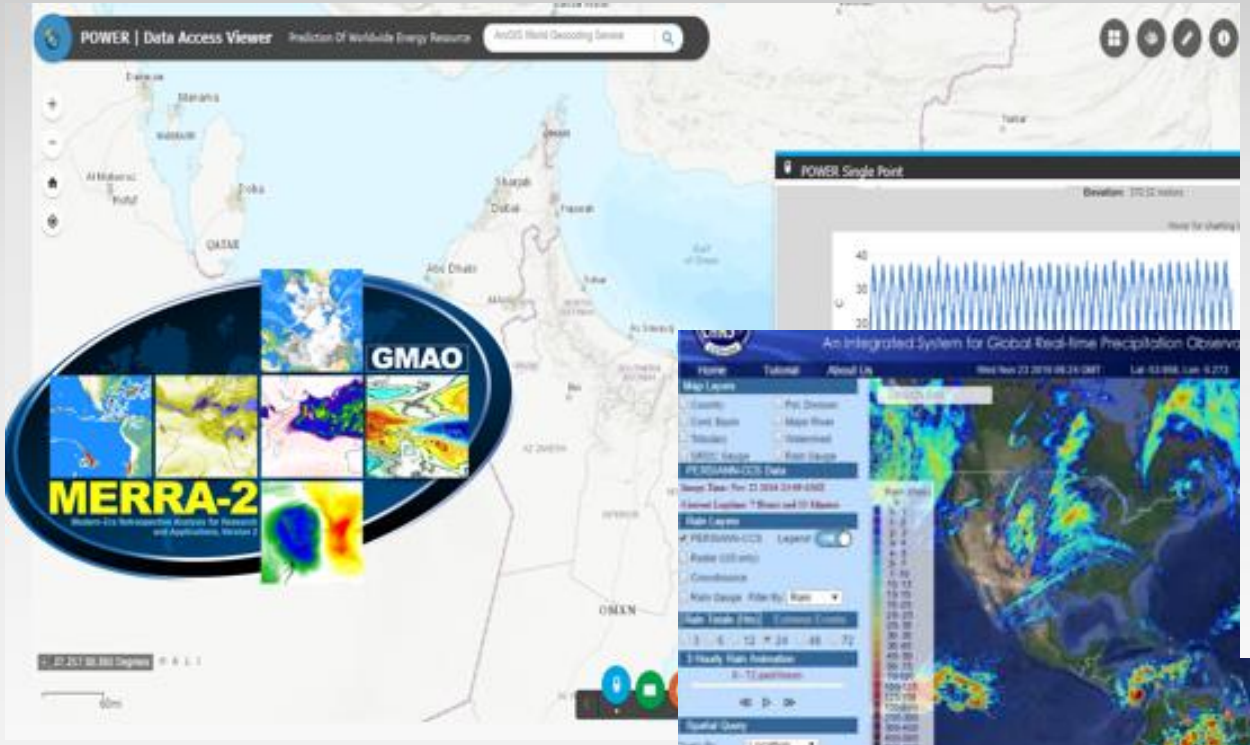


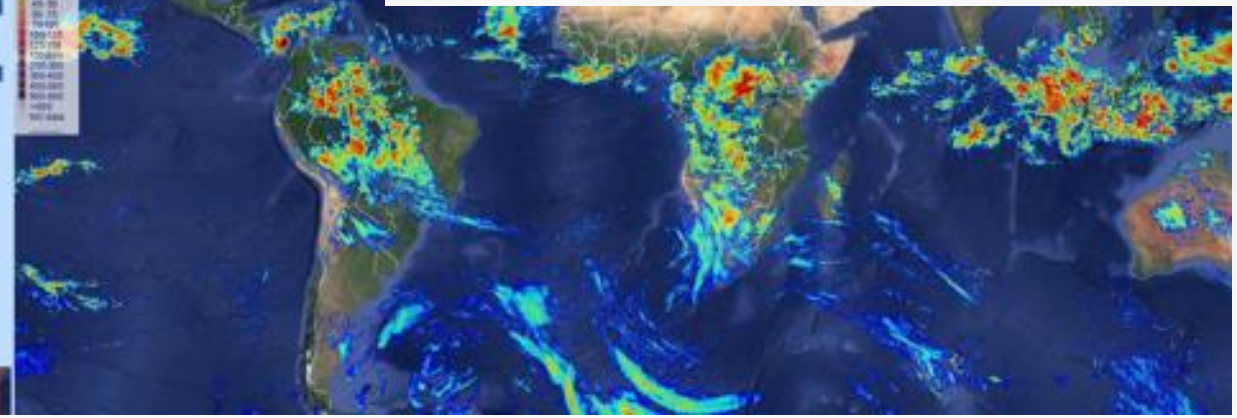


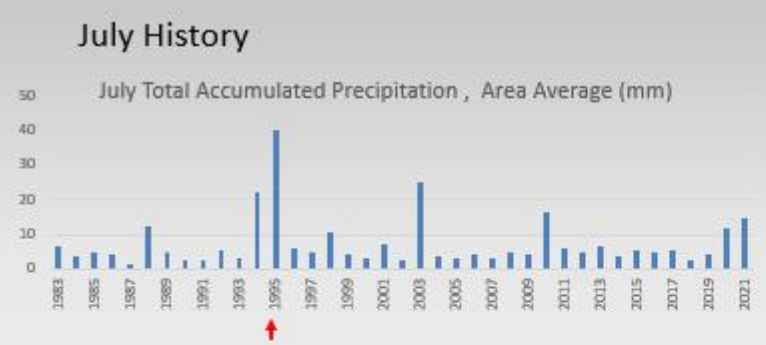


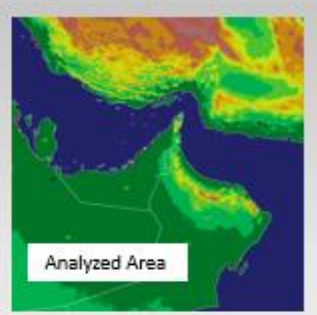
QGIS

Do we have more time !









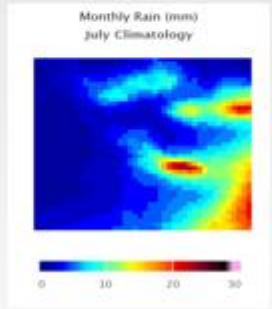
Where did this chart comes from?

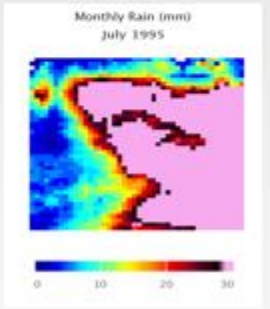
PERSIANN-CDR (Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks - Climate Data Record)

By: Center for Hydrometeorology and Remote Sensing (CHRS) at the University of California.

CHRS RainSphere (uci.edu)

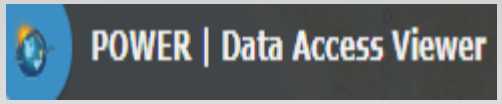
Resolution:
0.25° x 0.25°
27.8 x 27.8 km





List of useful links:

https://worldview.earthdata.nasa.gov/?lg=false&t=2023-03-04-T17%3A42%3A10Z



https://power.larc.nasa.gov/data-access-viewer/

http://tropic.ssec.wisc.edu/tropic.php

International Best Track Archive for Climate Stewardship (IBTrACS)

https://www.ncei.noaa.gov/products/international-best-track-archive

https://rainsphere.eng.uci.edu/

Thank You