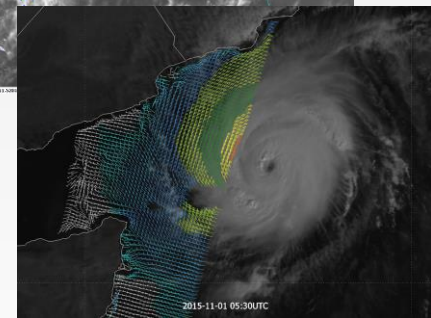
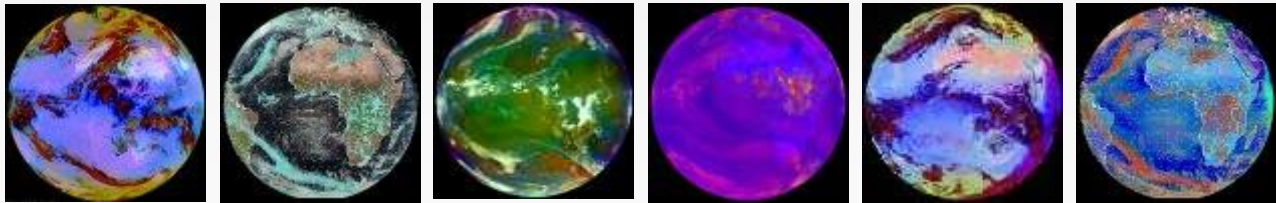
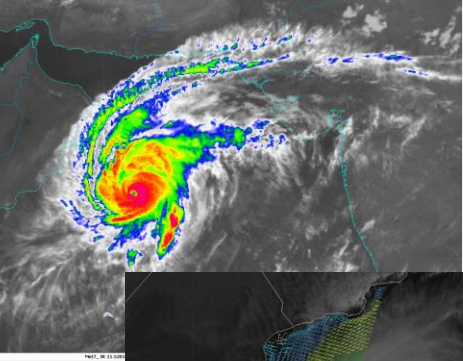
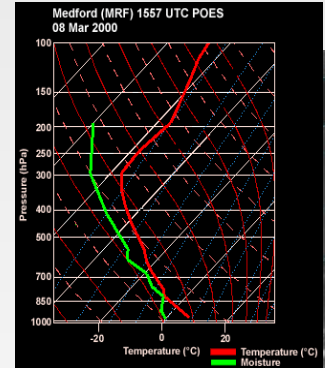
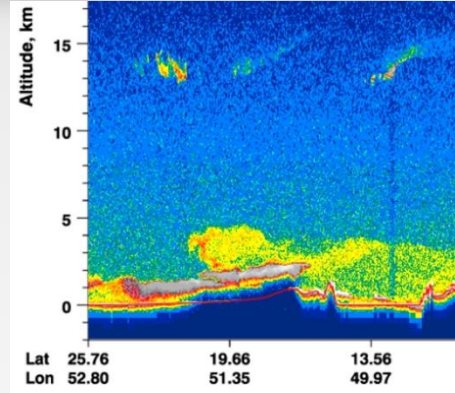
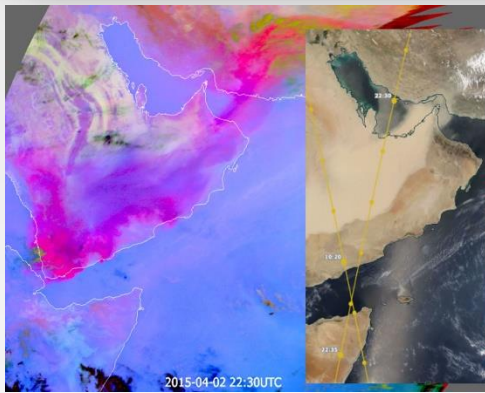
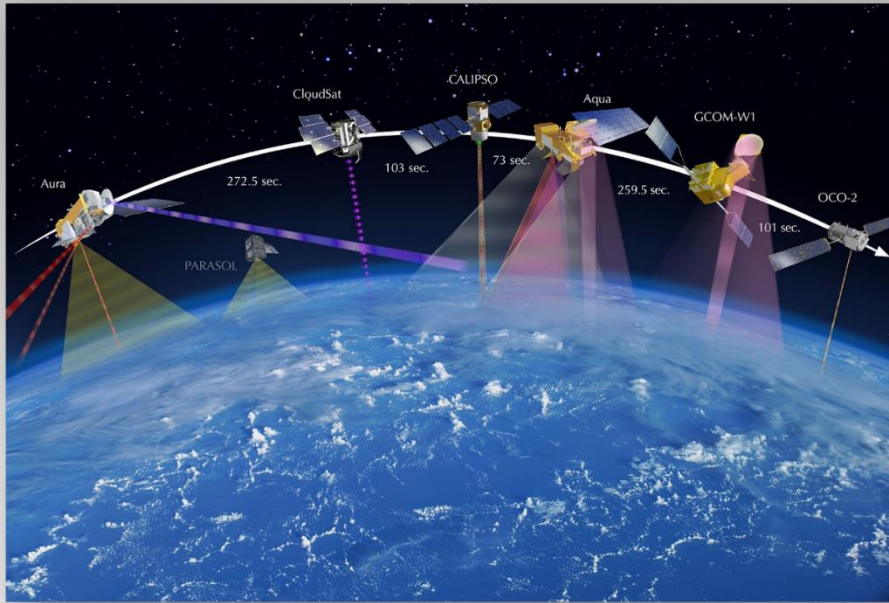


Weather Satellite

Web Based Visualization and Data Centers

Ibrahim Al Abdulsalam
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Top 7 SPACE AGENCIES IN THE WORLD

Space studies and research on the outer space has always intrigued man. Mankind has a thirst to know what is beyond the earth's atmosphere. Thus every nation has set up its own space agencies and research centres. They are numerous of them but only few are the ones who are of high quality, do extreme research, are technologically advanced and are well known around the world.

WE BRING YOU A LIST OF THE TOP 7 SPACE AGENCIES IN THE WORLD.

- NASA**
The National Aeronautics and Space Administration or NASA, United States, is the first provider. It was established in October 1958 and has been involved in high profile space programmes since then. Project Apollo was the first exploration mission to the moon held by NASA. Currently NASA is engaged in a number of missions which study climate changes, hydro-meteorological resources, mystery behind the development of Sun, and life on other planets, and so on.
- RSSA**
Russian Federation Space Agency or RSSA is one of the partners of the ISS or the International Space Station. It is one of the leading agencies actively engaged in development of space vehicles, launchers and ground based infrastructure. Founded prior to USSR in 1922, it suffered financial problems in the initial years but later managed to launch many successful missions.
- ESA**
European Space Agency or ESA are one of the best in launching vehicles for space orbits. It was established in 1975 by 10 member states. It now constitutes 22 member states. Together the nations handle space programmes far behind the reach of just a single nation.
- ISRO**
Indian Space Research Organisation or the ISRO became the first Asian space agency to reach the orbit of Mars. It is the world's first agency to have achieved this mission on the very first attempt. Formed in 1969, ISRO has launched 17 spacecrafts till date. It designs, manufactures satellites and launches programmes and space missions.
- CNSA**
China National Space Administration is currently involved in the deployment of satellites for telecommunication and Earth observations. In 2003 China joined America and Russia in the trio to make human spaceflight possible. Its latest unmanned lunar lander and rover reached the moon successfully in 2013.
- JAXA**
Japan Aerospace Exploration Agency was established in 2003. Its main work is to look at technological development, research work and launch of satellites into orbits, moon research, animal data and many other space researches. It is also responsible for observing the rainfall and carbon dioxide monitoring.
- SSI**
Space Studies Institute in California is a non profit organization founded in 1972. It has some very important research priorities like research on non-renewable resources. The institute's research on transport related mechanisms is useful to understand the orbit missions.



Towards Physical Reality

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



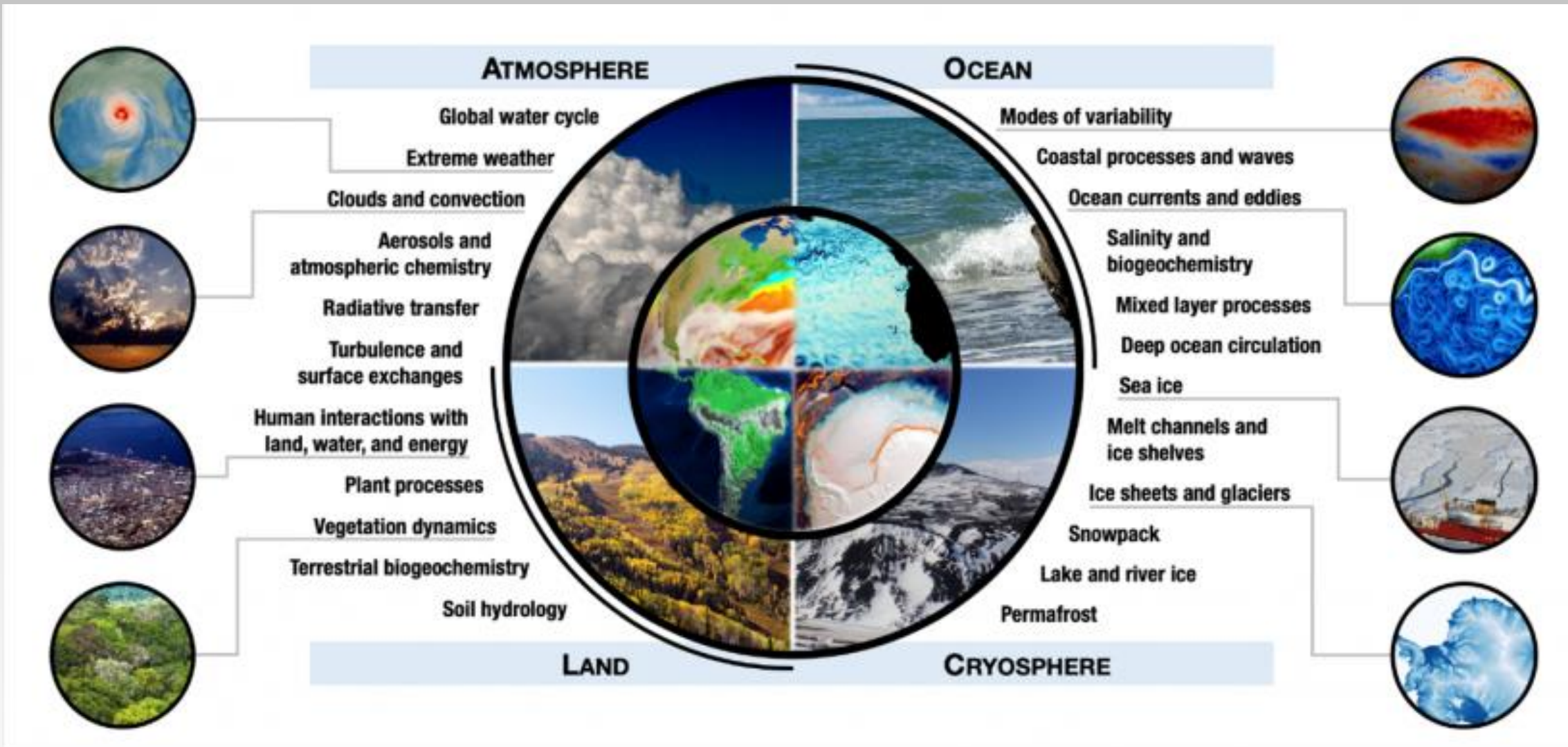
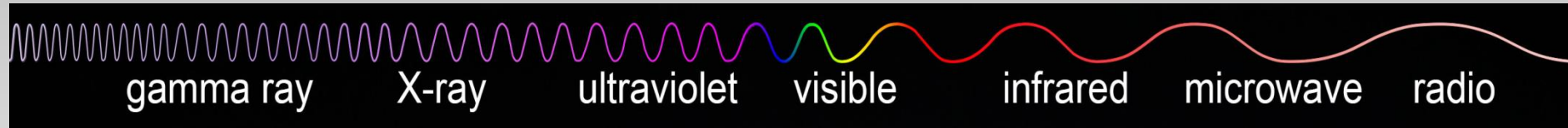


Image courtesy of Paul Ullrich, University of California, Davis

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, compositionetc



Satellites
observe electromagnetic waves

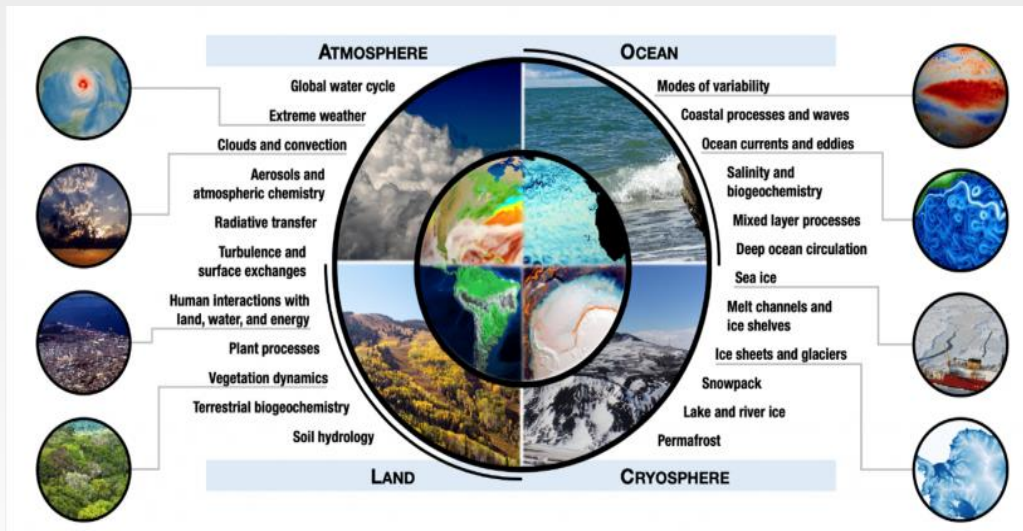


Processing and Visualization
observation is translated to data and images revealing the physical states, processes, motions, chemistry, compositionsetc

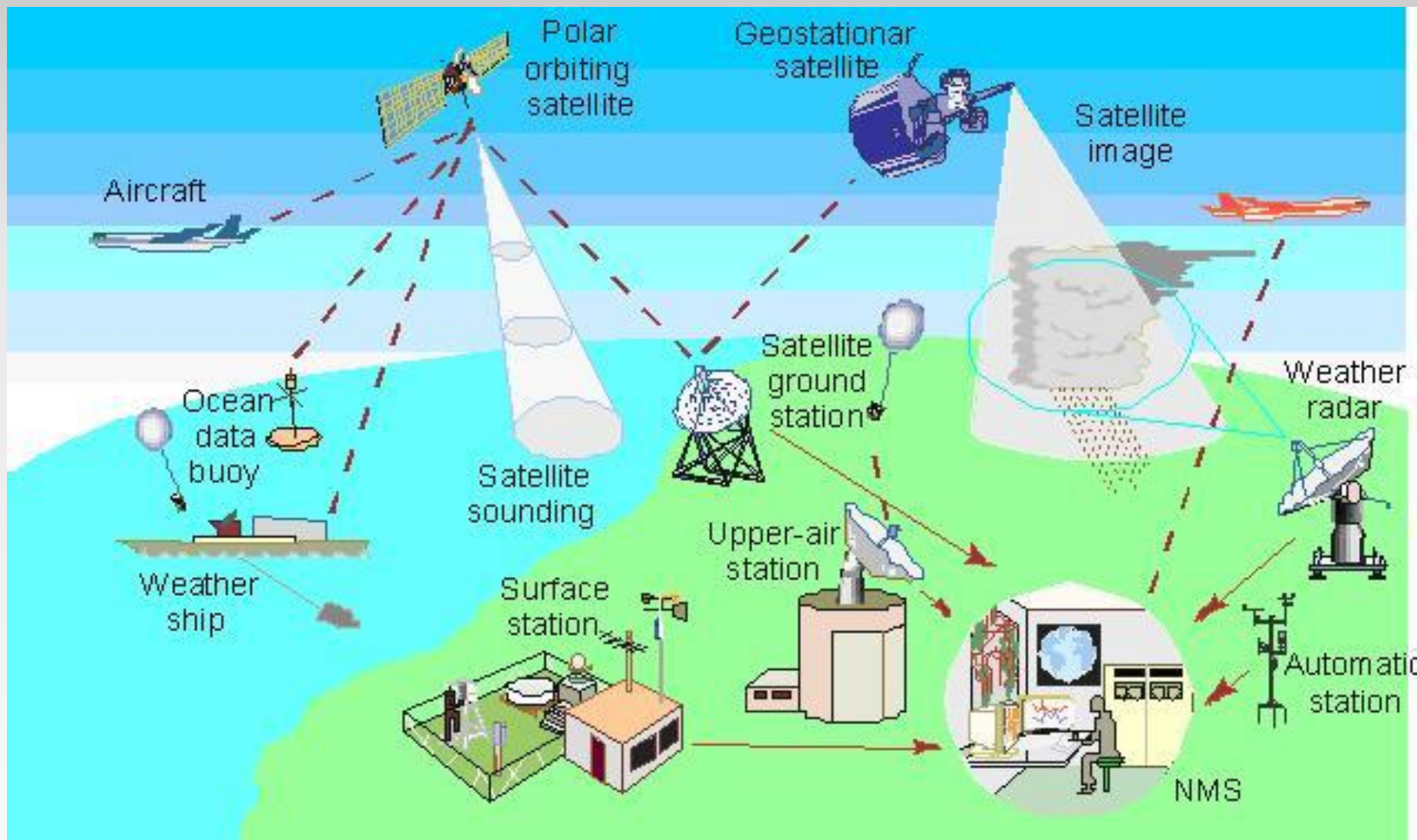


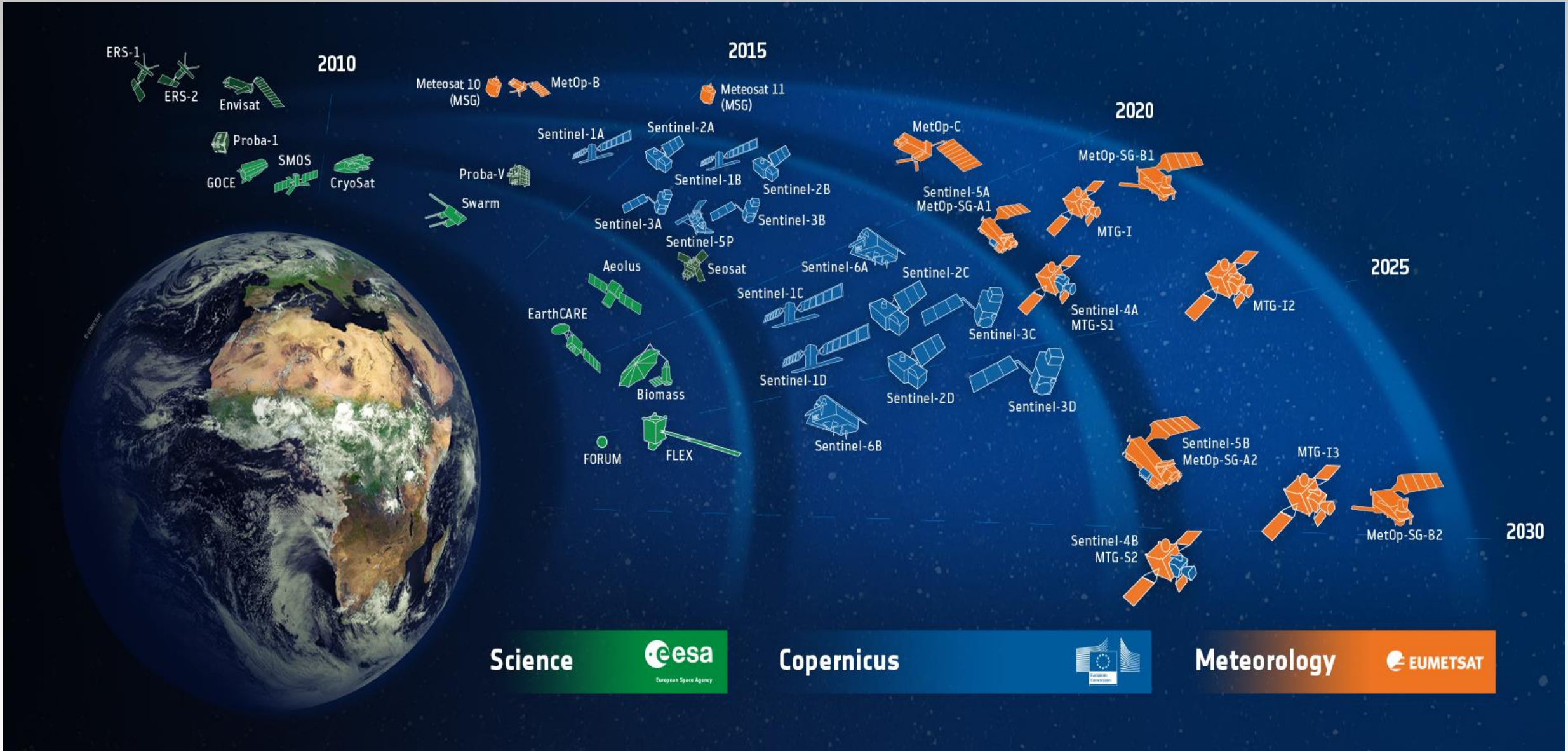
Products of Higher Level
AI , Machine learning ,NWP and Numerical analysis and Reanalysis

- Correction
- Calibration
- New methods and techniques

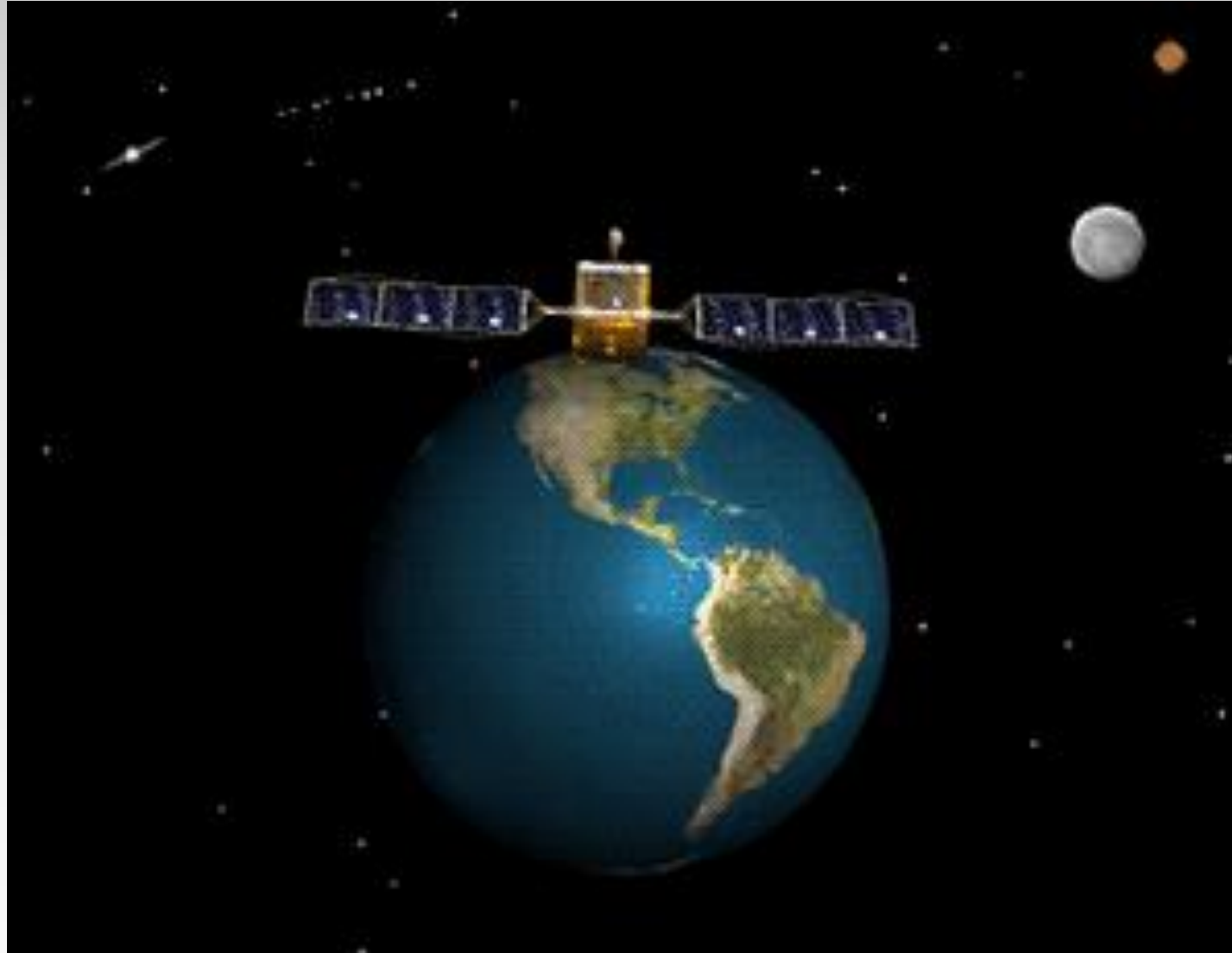


Weather Observation and Forecasting Systems

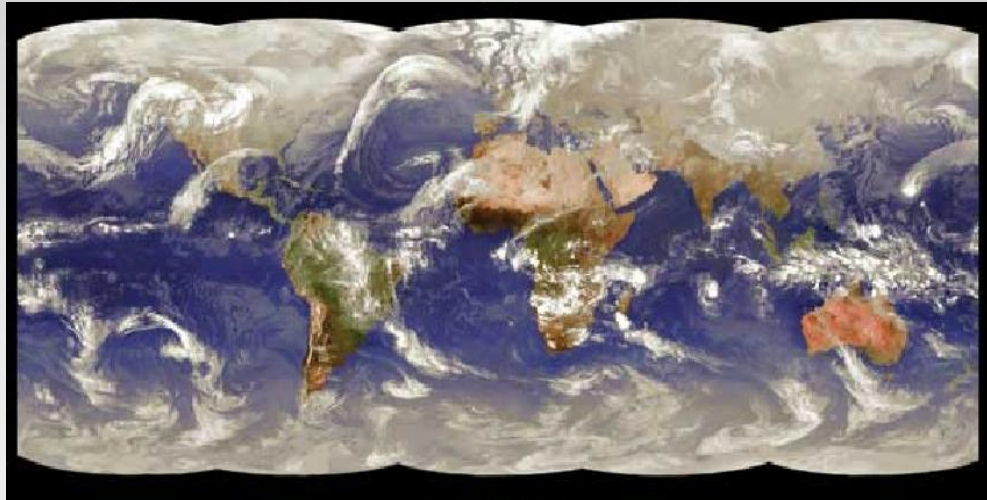




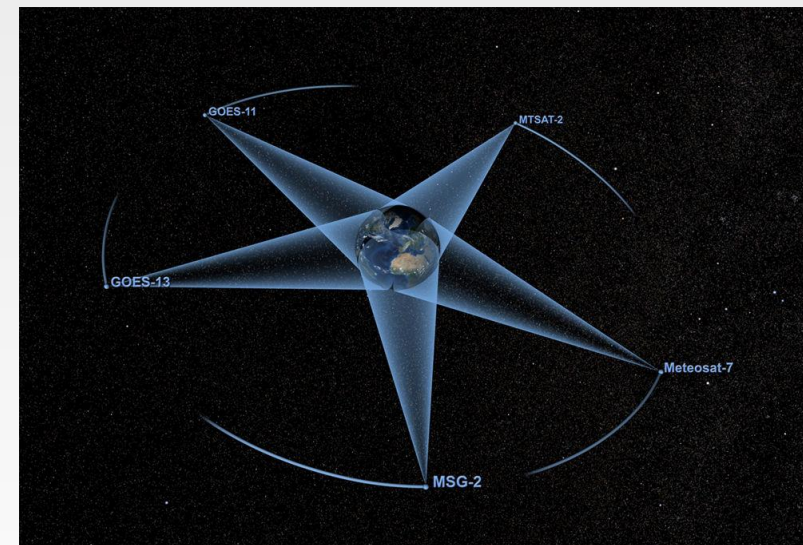
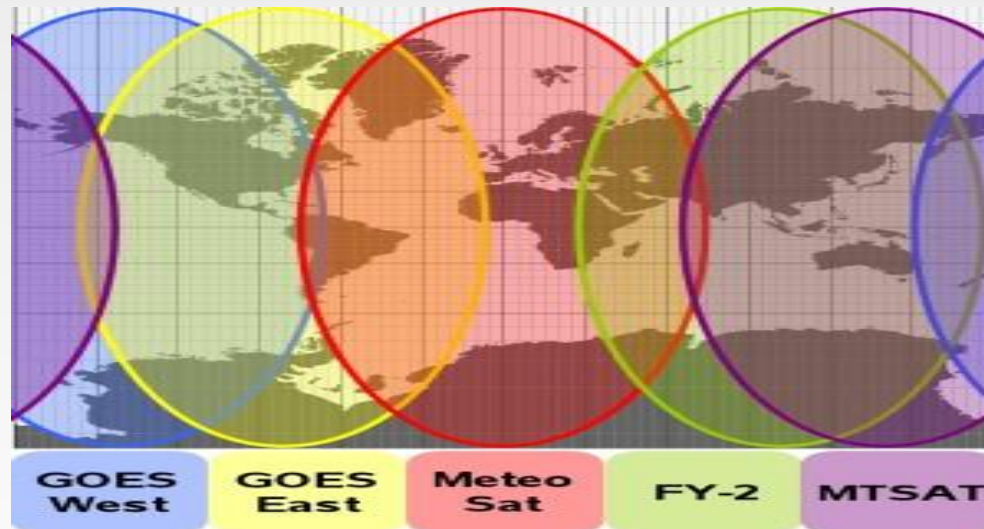
Geostationary

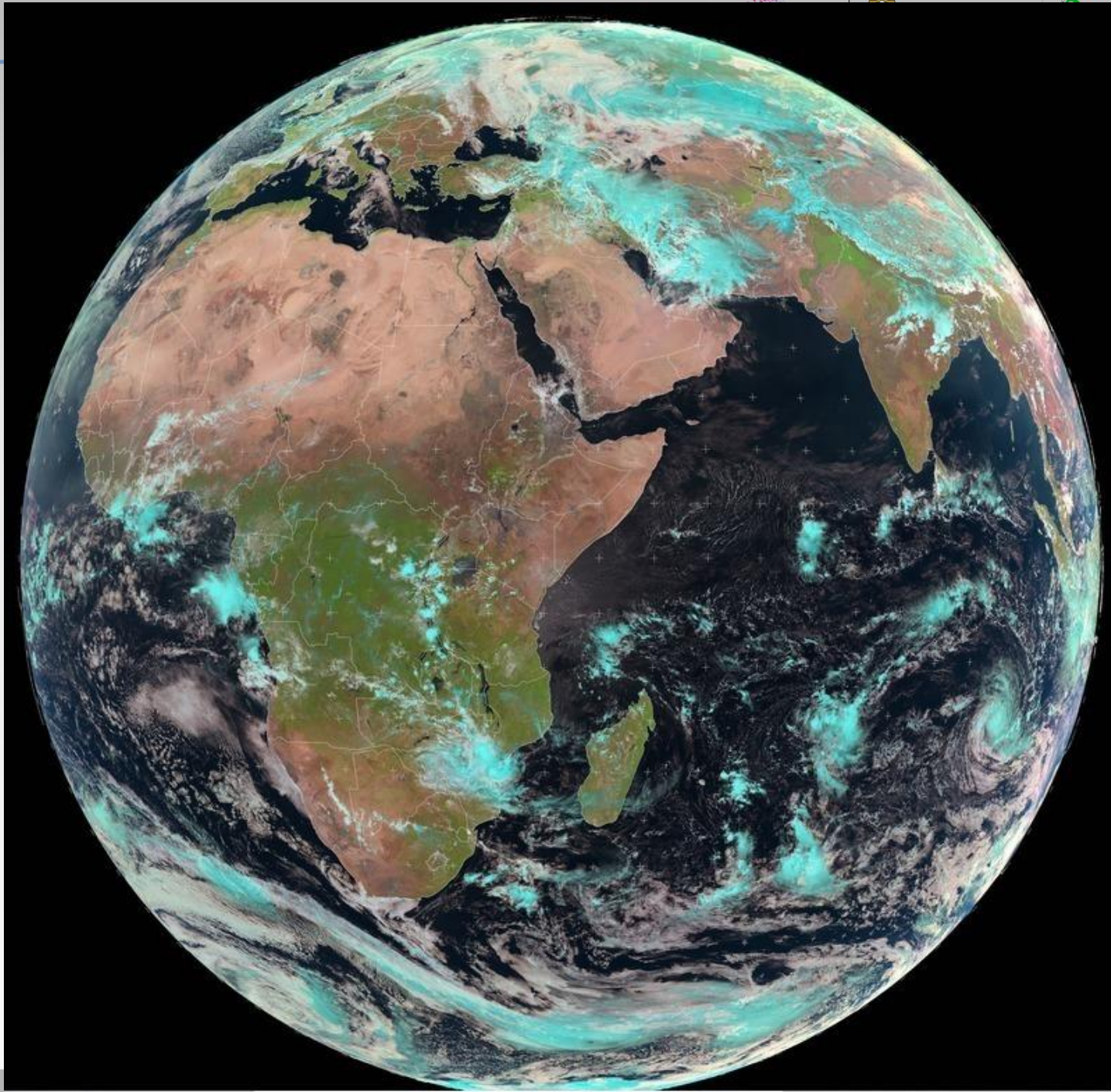


Satellite coverage



Geostationary



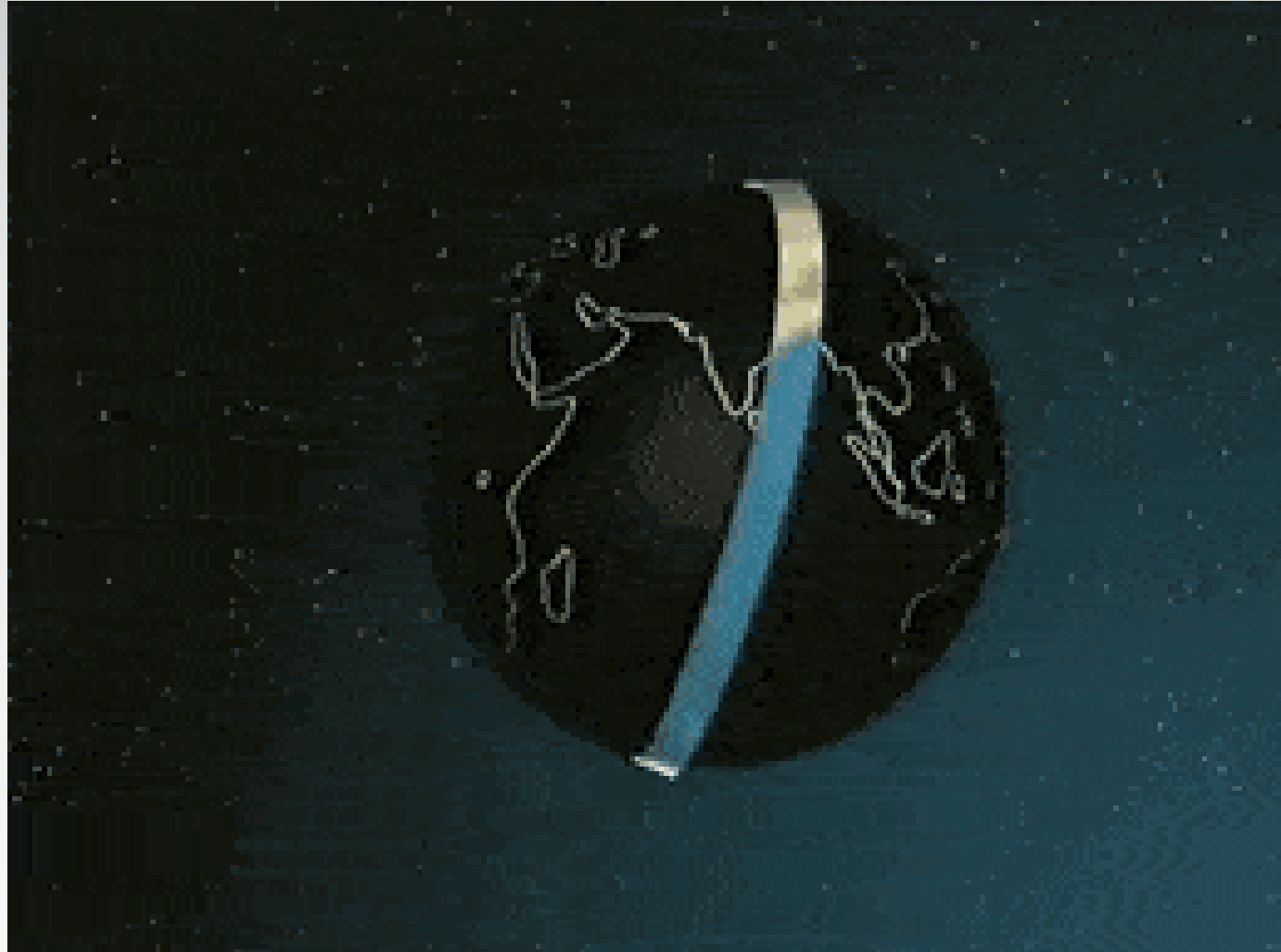


Ministry of Excellence - OMSAT
For Smart Applications



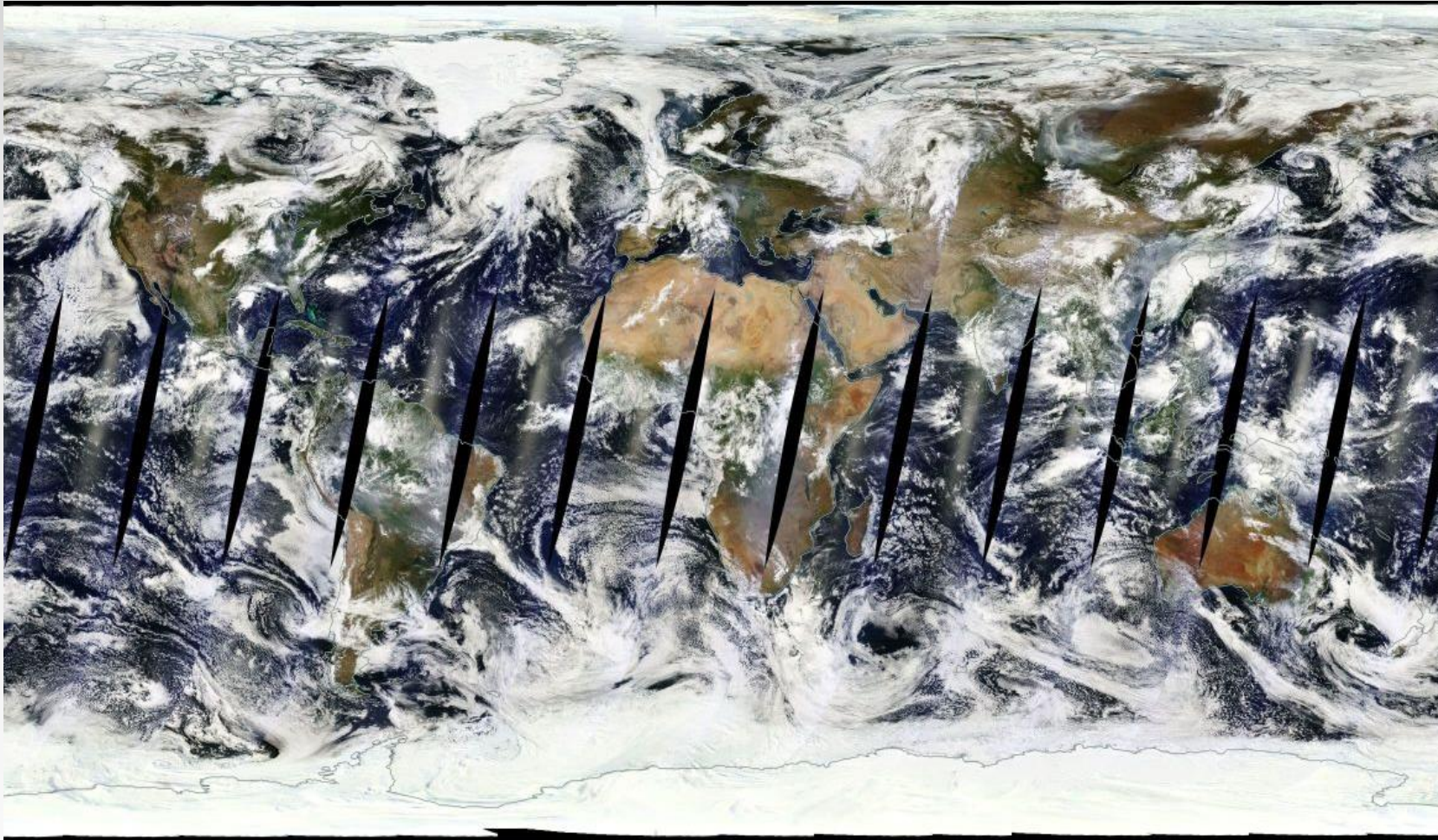
سلطنة عُمان
وزارة النقل والاتصالات وتقنية المعلومات
Sultanate of Oman
Ministry of Transport, Communications and
Information Technology

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:

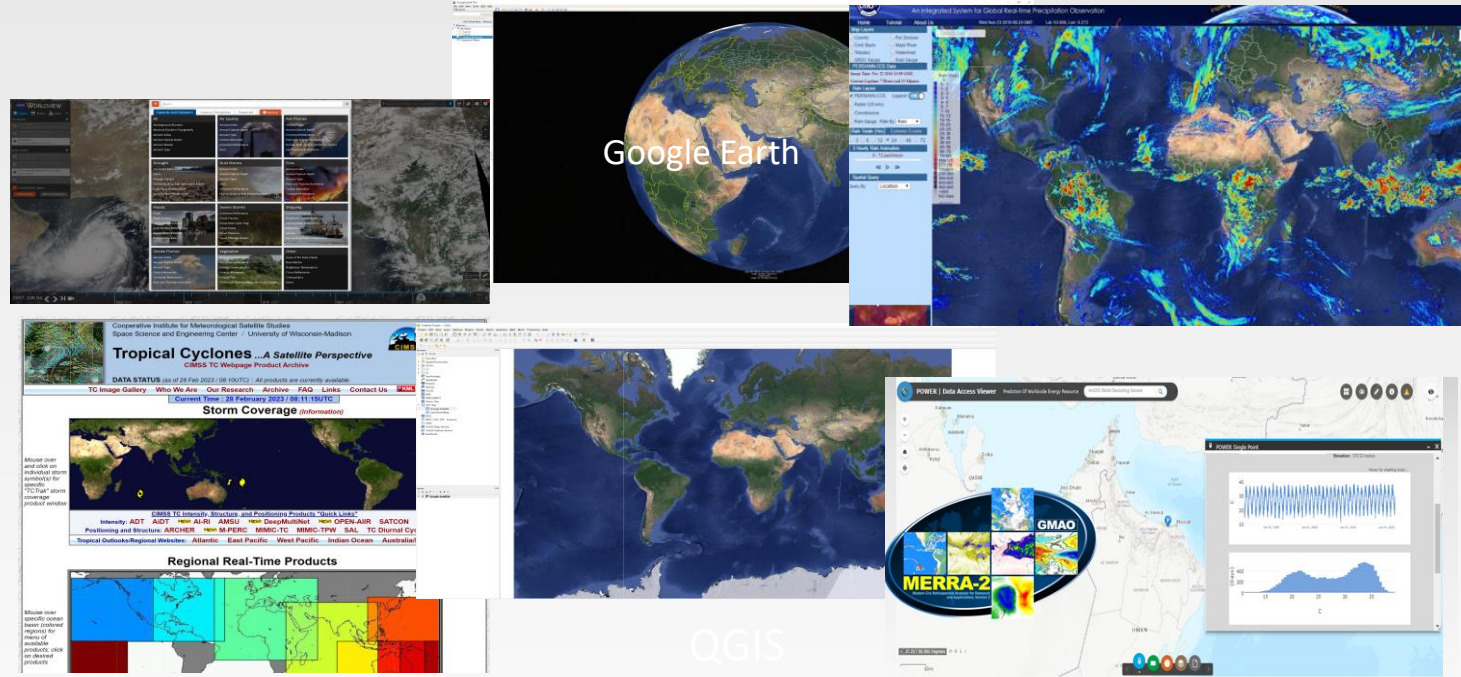
- TC Formation and Development
- True color image
- Brightness Temperature
- Satellite Track

- 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

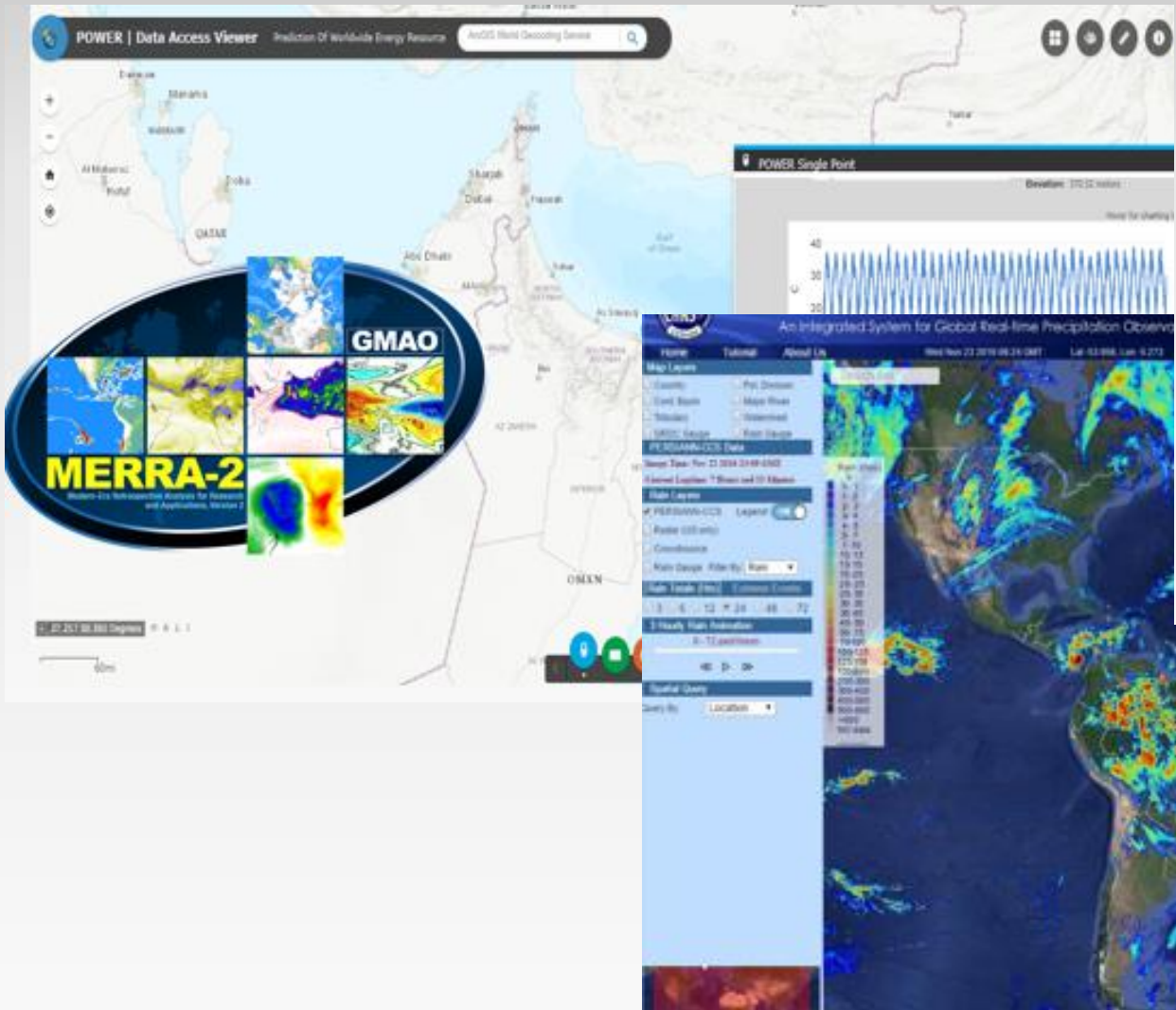
- TC Flash Floods and Its impacts, Soil Moisture
- Case of Flash Flood over Pakistan
- CHRS update

- 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 !

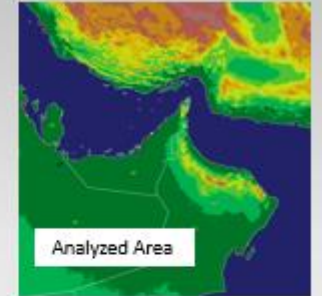


Do we have more time !



July History

July Total Accumulated Precipitation , Area Average (mm)



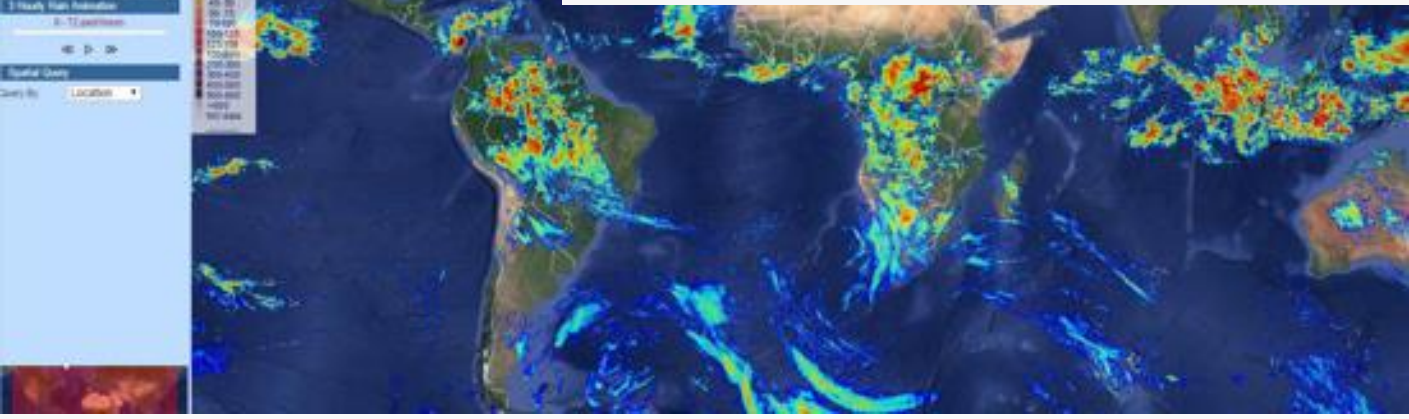
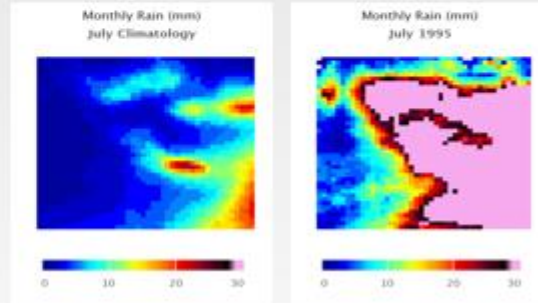
Where did this chart comes from?

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 \(uci.edu\)](http://CHRS.RainSphere(uci.edu))

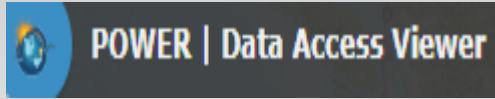
Resolution:
 0.25° x 0.25°
 27.8 x 27.8 km



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