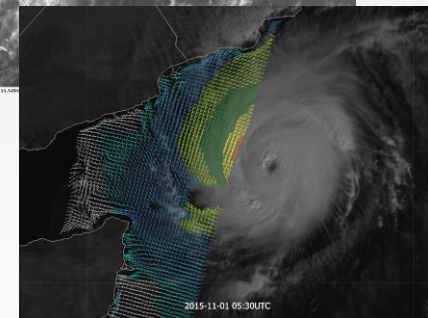
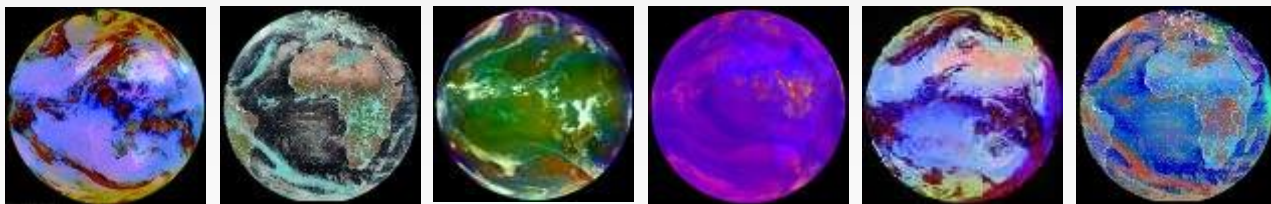
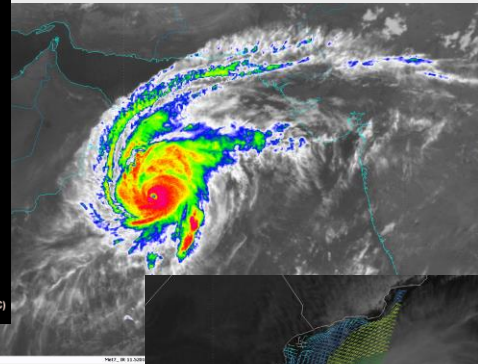
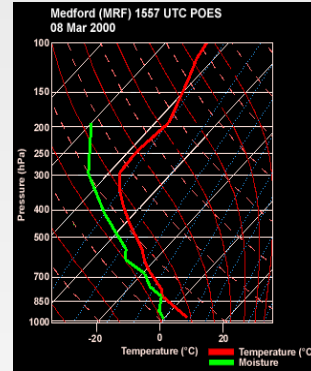
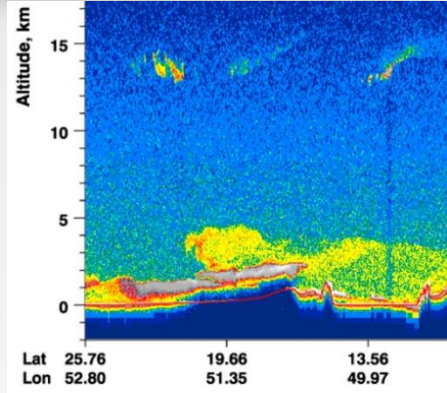
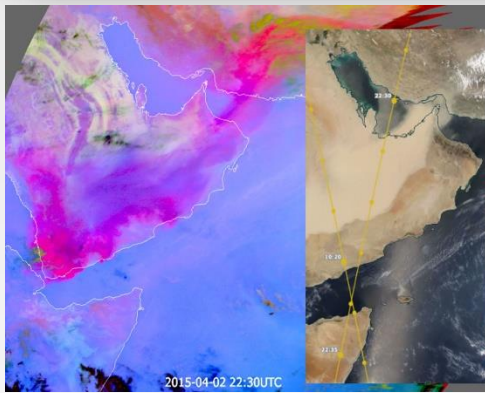
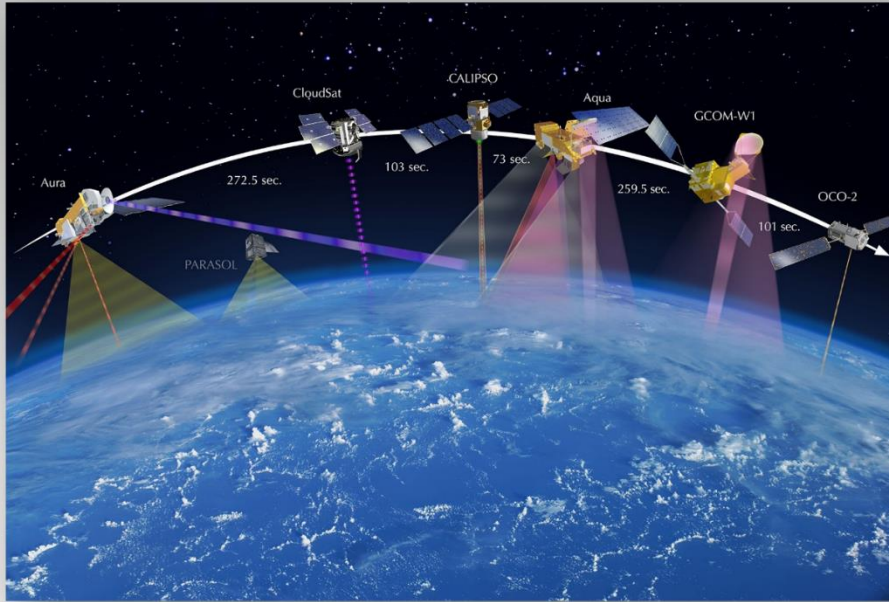


Weather Satellite

Web Based Visualization and Data Centers

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

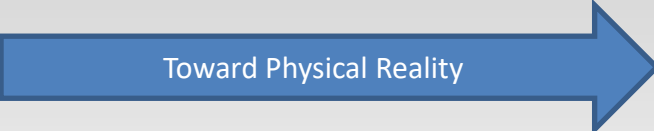


Top 7 SPACE AGENCIES IN THE WORLD

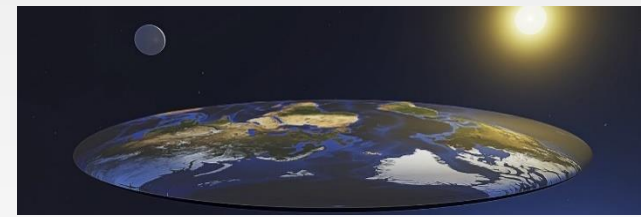
Space studies and research on the outer space has always intrigued man. Mankind has a thirst to know what is beyond the earth's atmosphere. Thus every nation has set up its own space agencies and research centres. They are numerous of them but only few are the ones who are of high quality, do extreme 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, biomedical research, 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 1977. 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.



- More :
- Observation
- Science
- Methods to process and visualize data
- Accuracy
- .Correction
- .Calibration
- .
- .



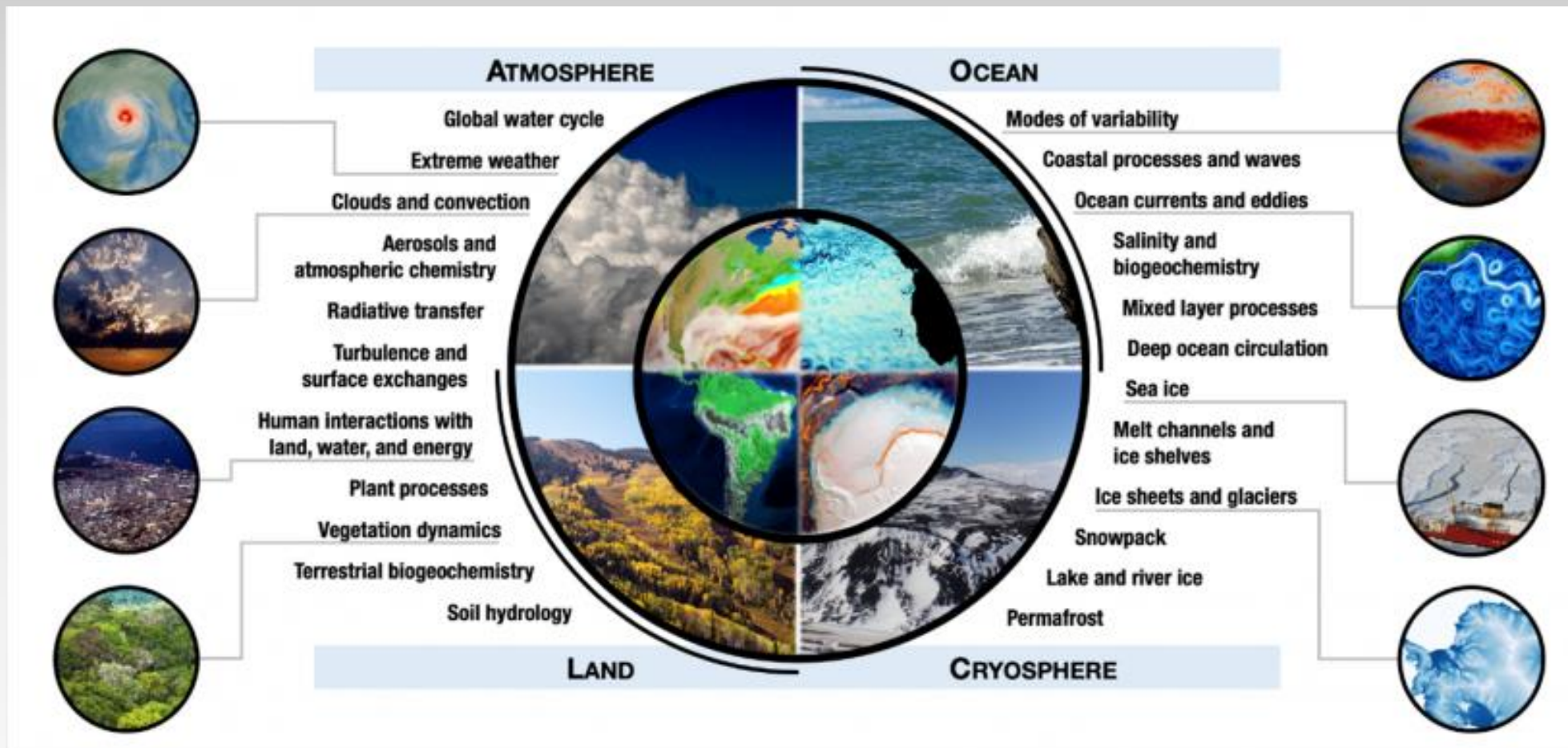


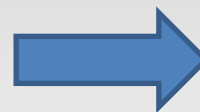
Image courtesy of Paul Ullrich, University of California, Davis

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

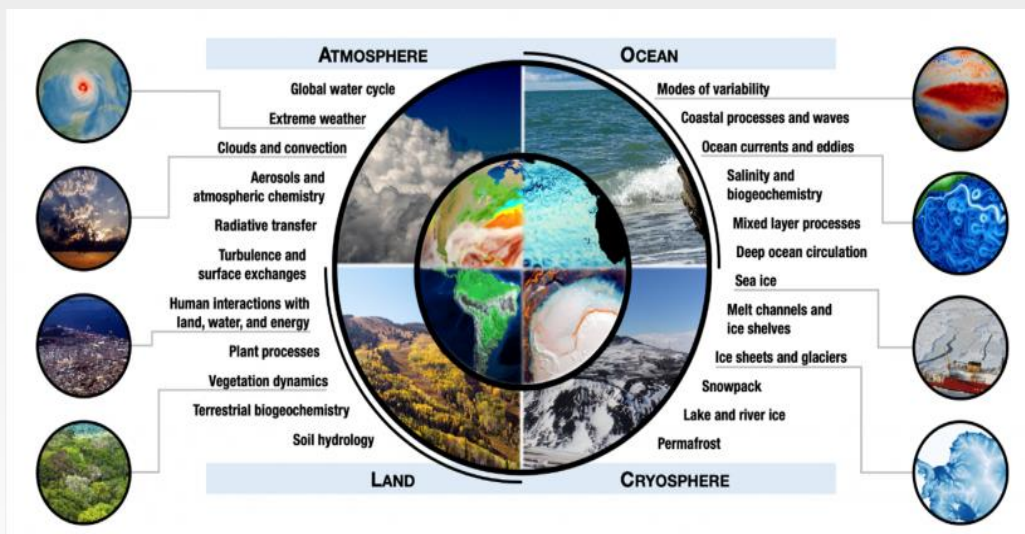


Processing and Visualization
observation is translated to data and images revealing the physical states, processes, motions, chemistry, compositionsetc

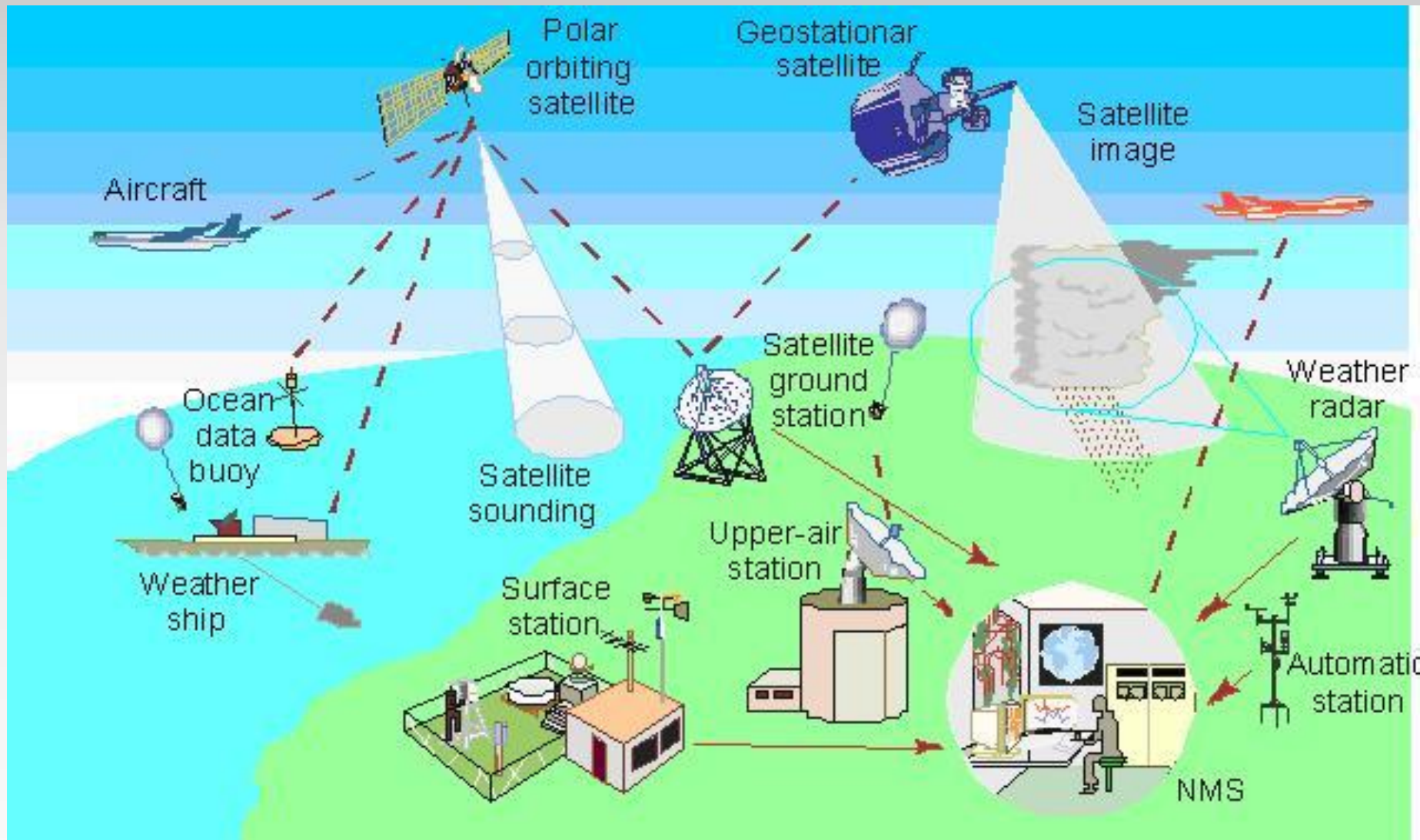


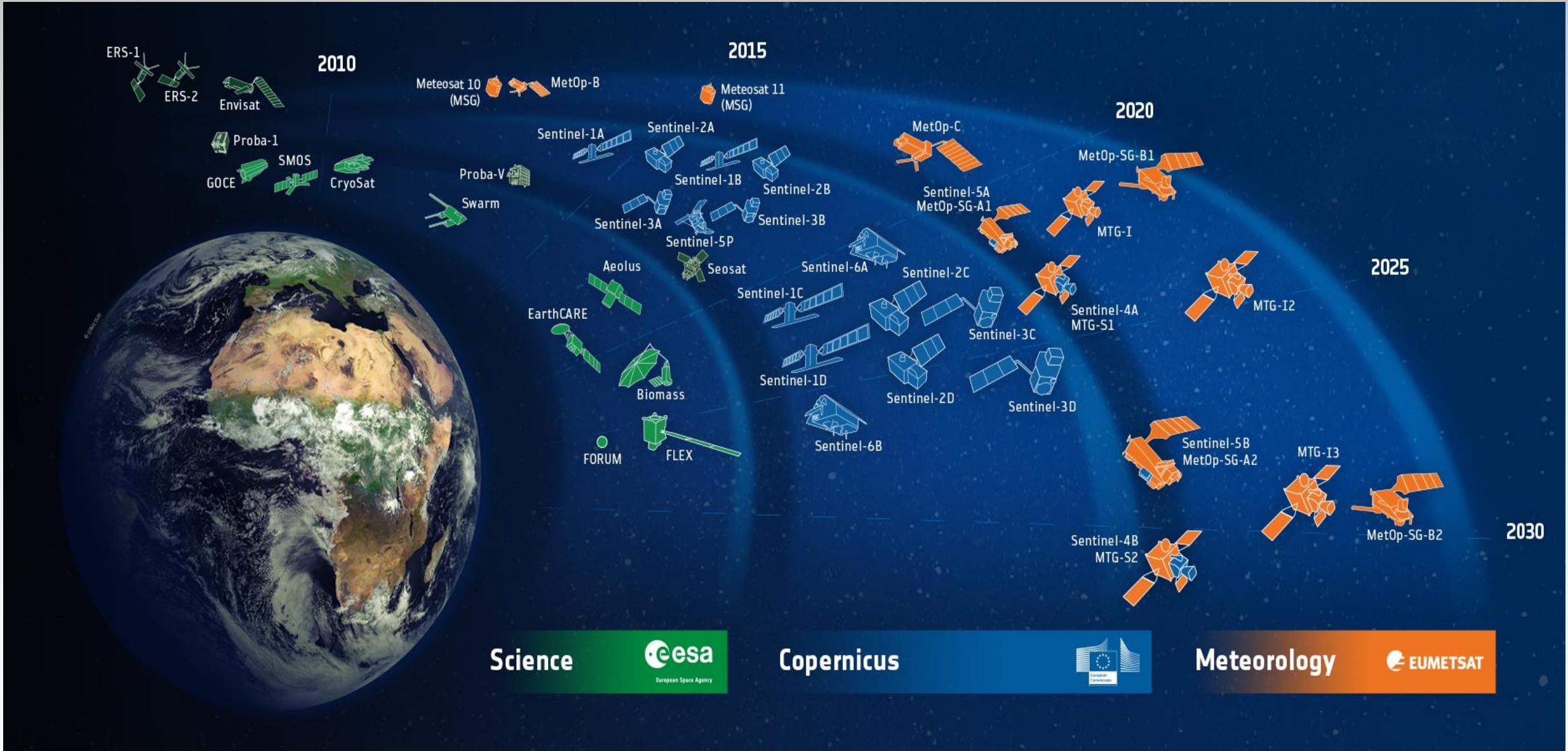
Products of Higher Level
AI , Machine learning ,NWP and Numerical analysis and Reanalysis

- Correction
- Calibration
- .
- .
- .



Weather Observation and Forecasting Systems





NASA WORLDVIEW

Layers Events Data

REFERENCE

- Place Labels
- Coastlines / Borders / Woods
- Coastlines

BASE LAYERS

- Corrected reflectance (True Color)
- Corrected Reflectance (True Color)
- Corrected Reflectance (True Color)
- Group Similar Layers

+ Add Layers Start Comparison

Search

Hazards And Disasters Science Disciplines Featured Recent

All

- Aboveground Biomass
- Absolute Dynamic Topography
- Aerosol Index
- Aerosol Optical Depth
- Aerosol Albedo
- Aerosol Type

Air Quality

- Aerosol Index
- Aerosol Optical Depth
- Aerosol Type
- Carbon Monoxide
- Corrected Reflectance
- Dust

Ash Plumes

- Aerosol Index
- Aerosol Optical Depth
- Corrected Reflectance
- Fires and Thermal Anomalies
- Human Built-up And Settlement Extent
- Land Surface Reflectance

Drought

- Corrected Reflectance
- Dams
- Drought Hazard
- Human Built-up And Settlement Extent
- Land Surface Reflectance
- Land Surface Temperature

Dust Storms

- Aerosol Index
- Aerosol Optical Depth
- Aerosol Type
- Dust
- Corrected Reflectance
- Human Built-up And Settlement Extent

Fires

- Aerosol Index
- Aerosol Optical Depth
- Aerosol Type
- Fires and Thermal Anomalies
- Carbon Monoxide
- Corrected Reflectance

Floods

- Flood
- Flood Hazard
- Corrected Reflectance
- Land Surface Reflectance
- Precipitation Estimate
- Precipitation Rate

Severe Storms

- Corrected Reflectance
- Cloud Fraction
- Cloud Multi Layer Flag
- Cloud Phase
- Cloud Pressure
- Cloud Effective Radius

Shipping

- Corrected Reflectance
- Brightness Temperature
- Land Surface Reflectance
- Radiance
- Sea Ice
- Sea Ice Brightness Temperature

Smoke Plumes

- Aerosol Index
- Aerosol Optical Depth
- Aerosol Type
- Carbon Monoxide
- Corrected Reflectance
- Fires and Thermal Anomalies

Vegetation

- Aboveground Biomass
- Corrected Reflectance
- Canopy Characteristics
- Forests, Mangrove
- Freeze/Thaw
- Fraction of Photosynthetically Active Radiati...

Other

- Areas of No Data (mask)
- Blue Marble
- Brightness Temperature
- Cirrus Reflectance
- Chlorophyll a
- Dams

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.

2007 JUN 04 1 DAY

FEB 2007 MAR 2007 APR 2007 MAY 2007 JUN 2007 DAY

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 Flash Floods and Its impacts, Soil
Moisture

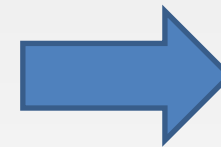
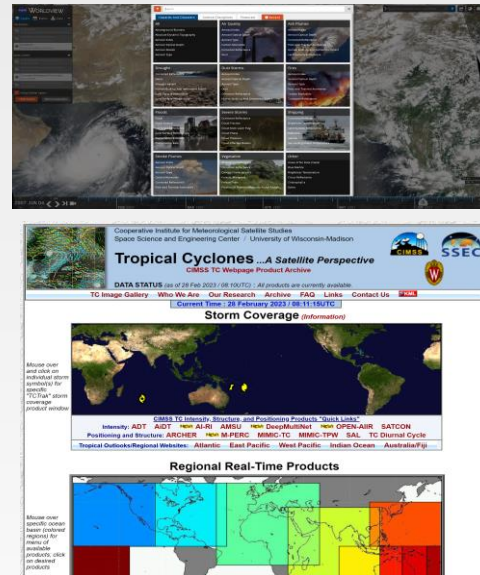
Case of Flash Flood over Pakistan
+ CHRS update

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

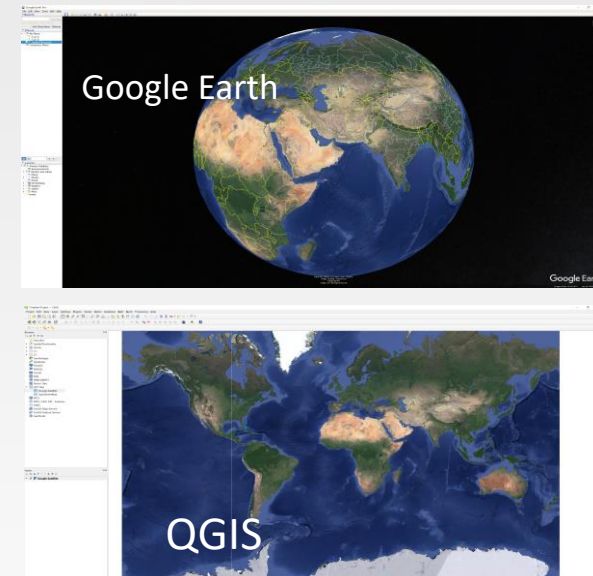
Look at the SST Globally / Seasonally

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

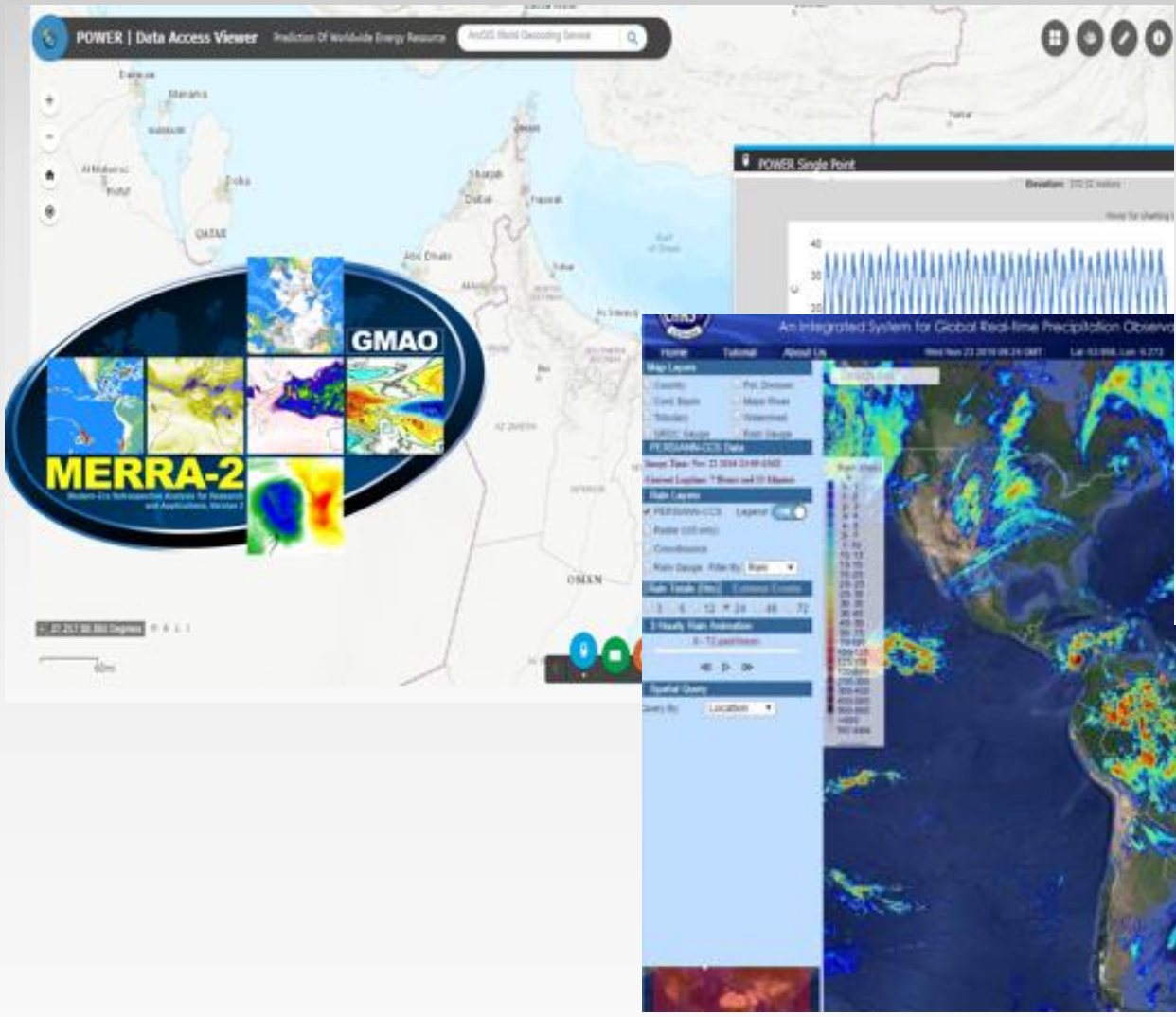
Data and images sources like:



Visualized by:

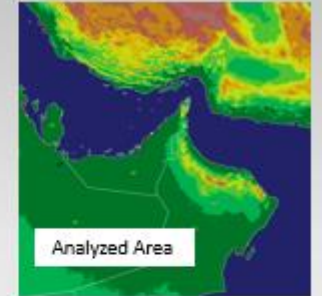


Do we have more time !



July History

July Total Accumulated Precipitation , Area Average (mm)



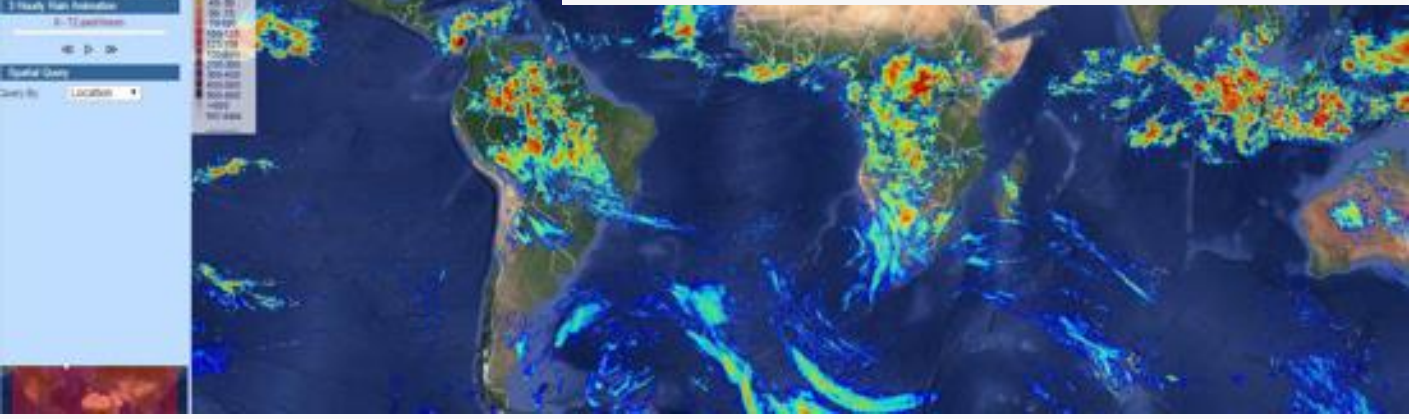
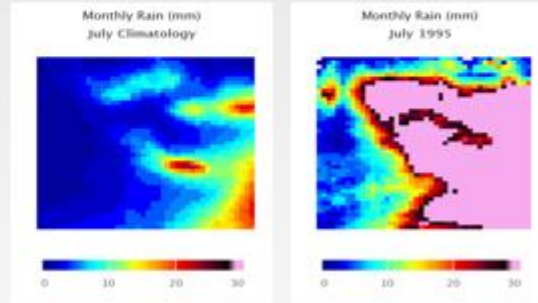
Where did this chart comes from?

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



Thank You