

ATMOS 2021

ESA Earth Observation Activities - Highlights on Atmosphere

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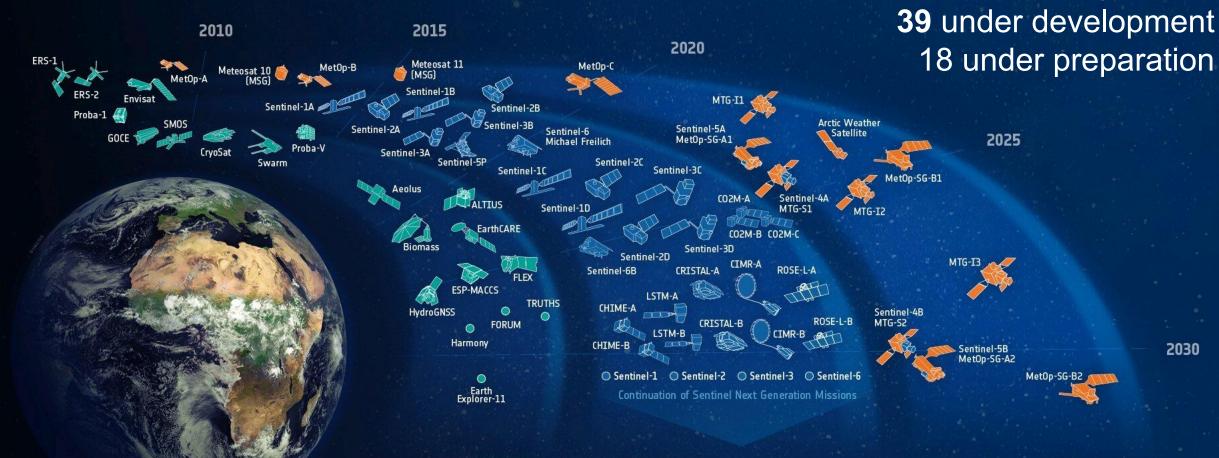
2021-11-22

ESA-Developed Earth Observation Missions



Satellites

15 in operation



Science



Copernicus



Meteorology



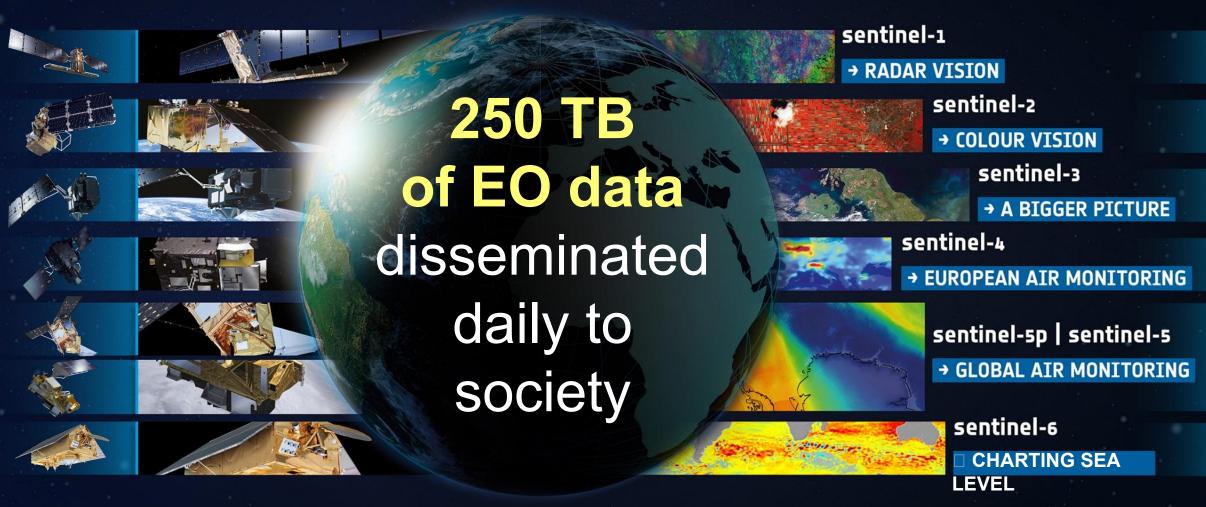
Earth Explorers - High Risks for Great Rewards





Copernicus Sentinels (First Generation)



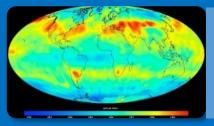


Copernicus: Sentinel Expansion Missions



CO2M - Anthropogenic CO₂ Monitoring





Causes of Climate Change

Agriculture & Urban Management

CRISTAL – Polar Ice & Snow Topography

CHIME – Hyperspectral Imaging Mission

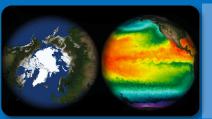


Effects of Climate Change

Food Security, Soil, Minerals, Biodiversity

CIMR – Passive Microwave Radiometer

ROSE-L – L-band SAR Mission



Sea: Surface Temp. & Ice Concentration

Vegetation & Ground Motion & Moisture

Third Party Missions

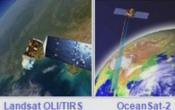


















https://earth.esa.int/eogateway/

□ ATMOS 2021 - ESA ATMOSPHERIC SCIENCE CONFERENCE

FutureEO-1 Segment 2 - Research Missions - EE11

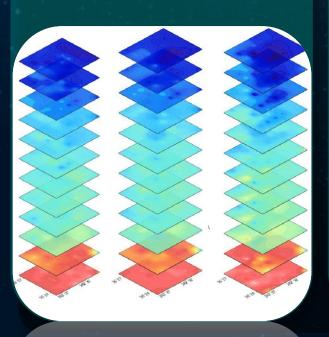
(4 candidates with expected launch 2031)



CAIRT

Understanding the links between CC and atmospheric chemistry and dynamics at 5 to 120 km

First limb-sounder with imaging Fourier-transform infrared technology in space



Nitrosat

Understanding the links between CC and the natural carbon and nitrogen cycles

Measurement of nitrogen dioxide and ammonia, two important reactive nitrogen compounds in the atmosphere



WIVERN

Improving the prediction of high-impact weather and hazard warnings

Dual-polarisation, conically scanning 94 GHz Doppler radar for measuring wind in clouds and delivering profiles of rain, snow

Seastar

Understanding air—sea interactions using two-antenna along-track interferometry radar

Providing ocean surface current & wind vectors at 1 km resolution for all the coastal ocean, shelf seas and marginal





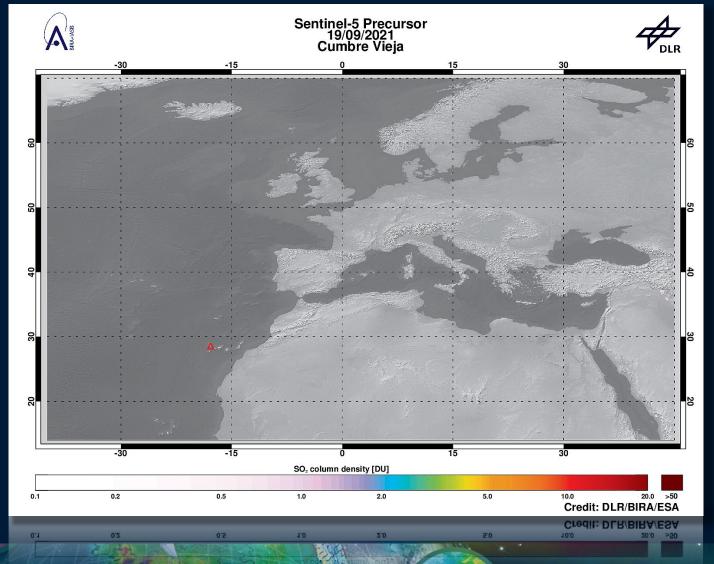
Science Highlights: Volcanic Eruptions seen by

esa

Copernicus Sentinel-5p

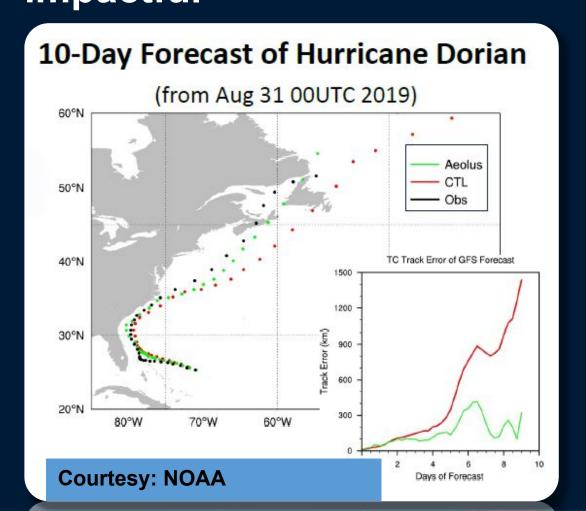
- Cumbre Vieja, La Palma from Sep 19, 2021
- Etna, SicilySep 21, 2021Oct 23, 2021

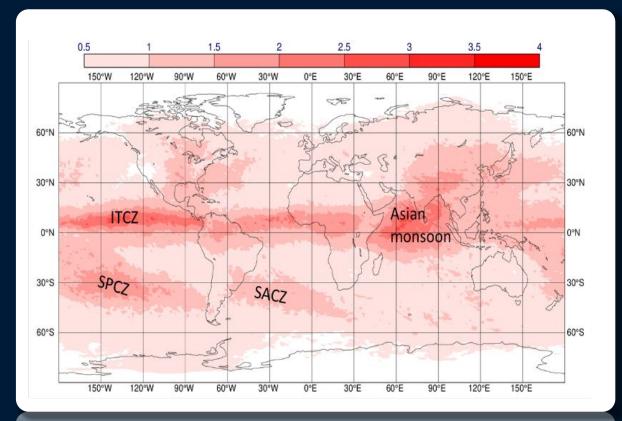
More details on Sentinel-5P in presentation by C. Zehner later in this session



Science Highlights: Aeolus data is operational and impactful







Positive impact (red) when assimilating Aeolus winds from 4 April to 19 August 2020 (M. Rennie – ECMWF)

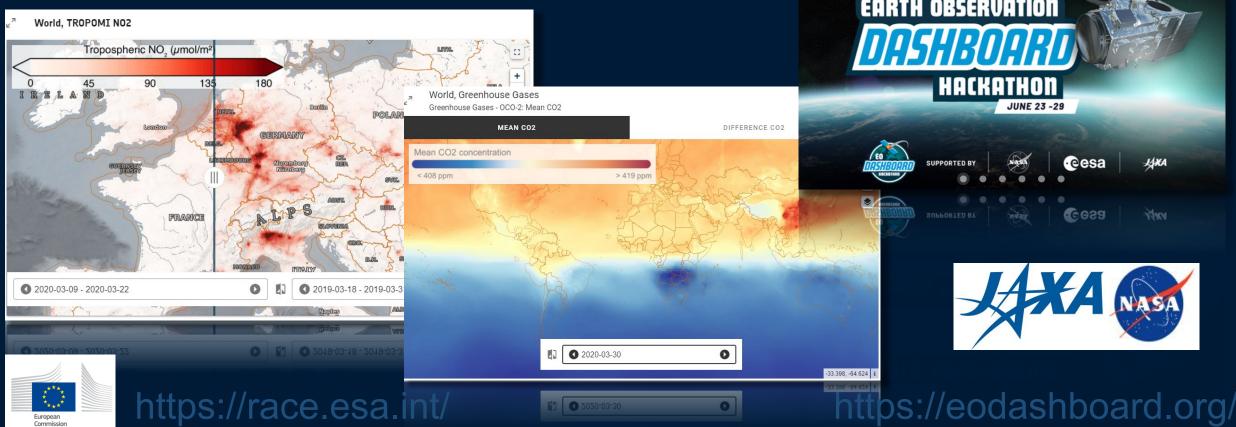


Science Highlights:



RACE - Rapid Action on coronavirus and EO &

Tri-lateral Earth Observing Dashboard





- ESA ATMOSPHERIC SCIENCE CONFERENCE

ATMOS-2021 - Scientific Objectives Highlights



- Provide a platform for scientific exchange and to assess the state of the art of atmospheric applications;
- Foster the scientific community in atmospheric research;
- Present mission status, algorithms, and products for Copernicus Sentinel-5p and Aeolus;
- Provide updates on development and science activities regarding future missions;
- Provide updates on activities regarding ESA Third Party missions;
- Present large scale international initiatives to support the R&D activities relevant to atmosphere satellite missions;
- Present scientific results related to the Copernicus Services CAMS & C3S;
- Discuss novel atmospheric missions.

Provide a forum for scientists to formulate community recommendations (scientific agenda)





