

Mission to Planet Earth



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Pint of Science

16 May 2018

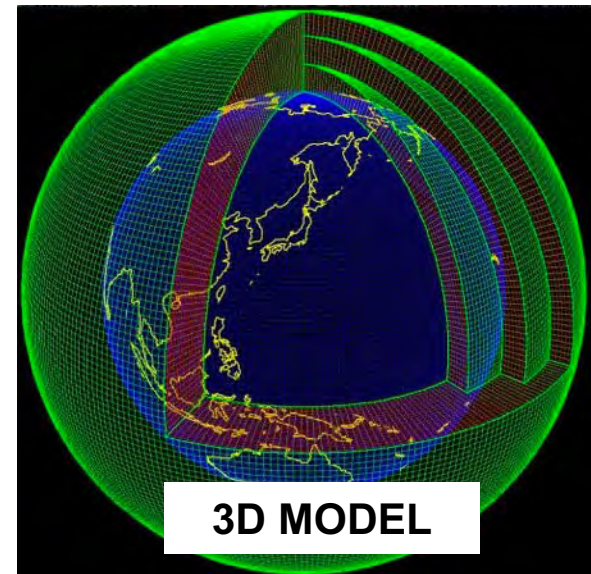
Research Group



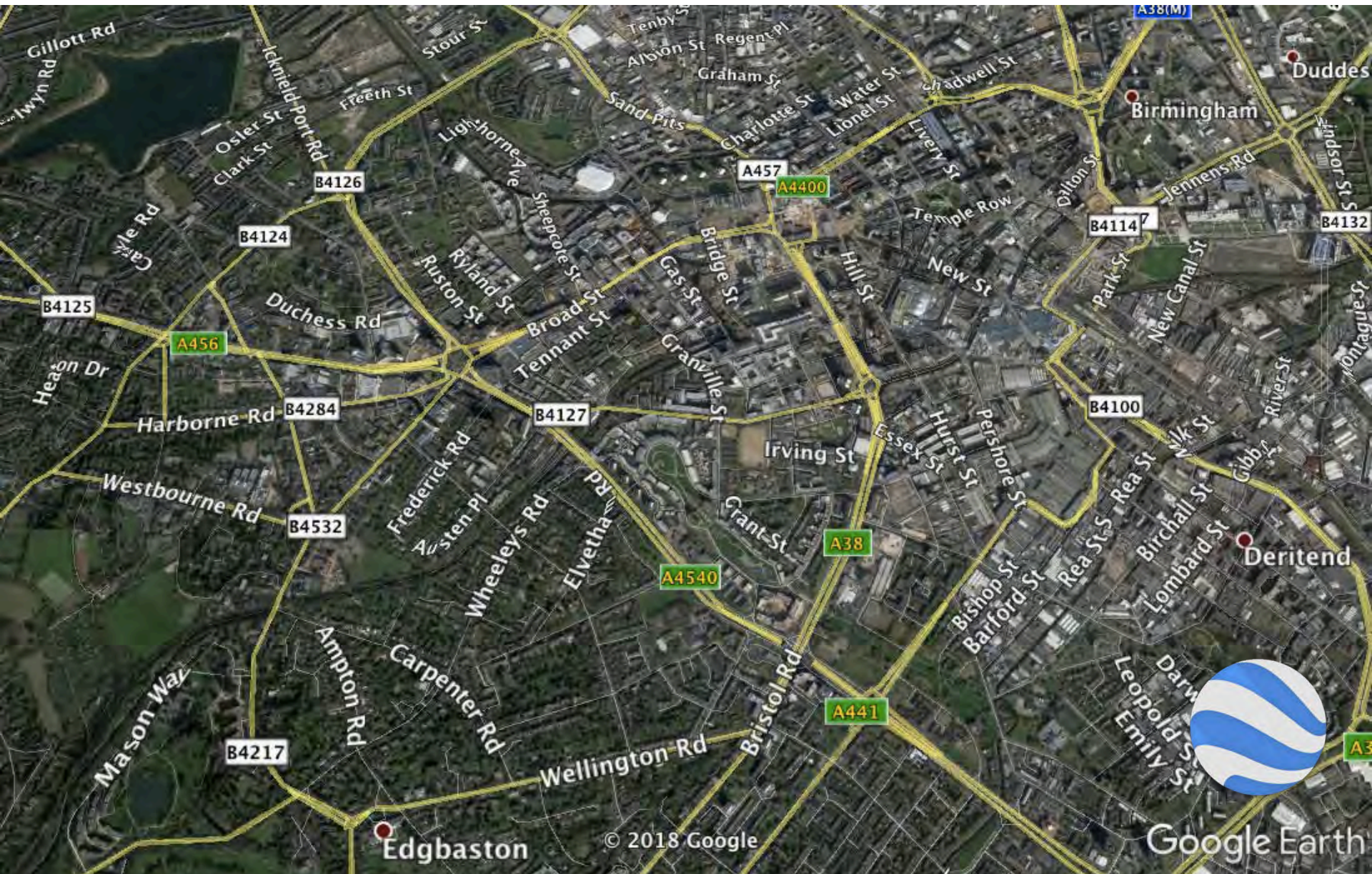
Research Tools



Collaborators



Satellite Images



Spectrometers in the Lab



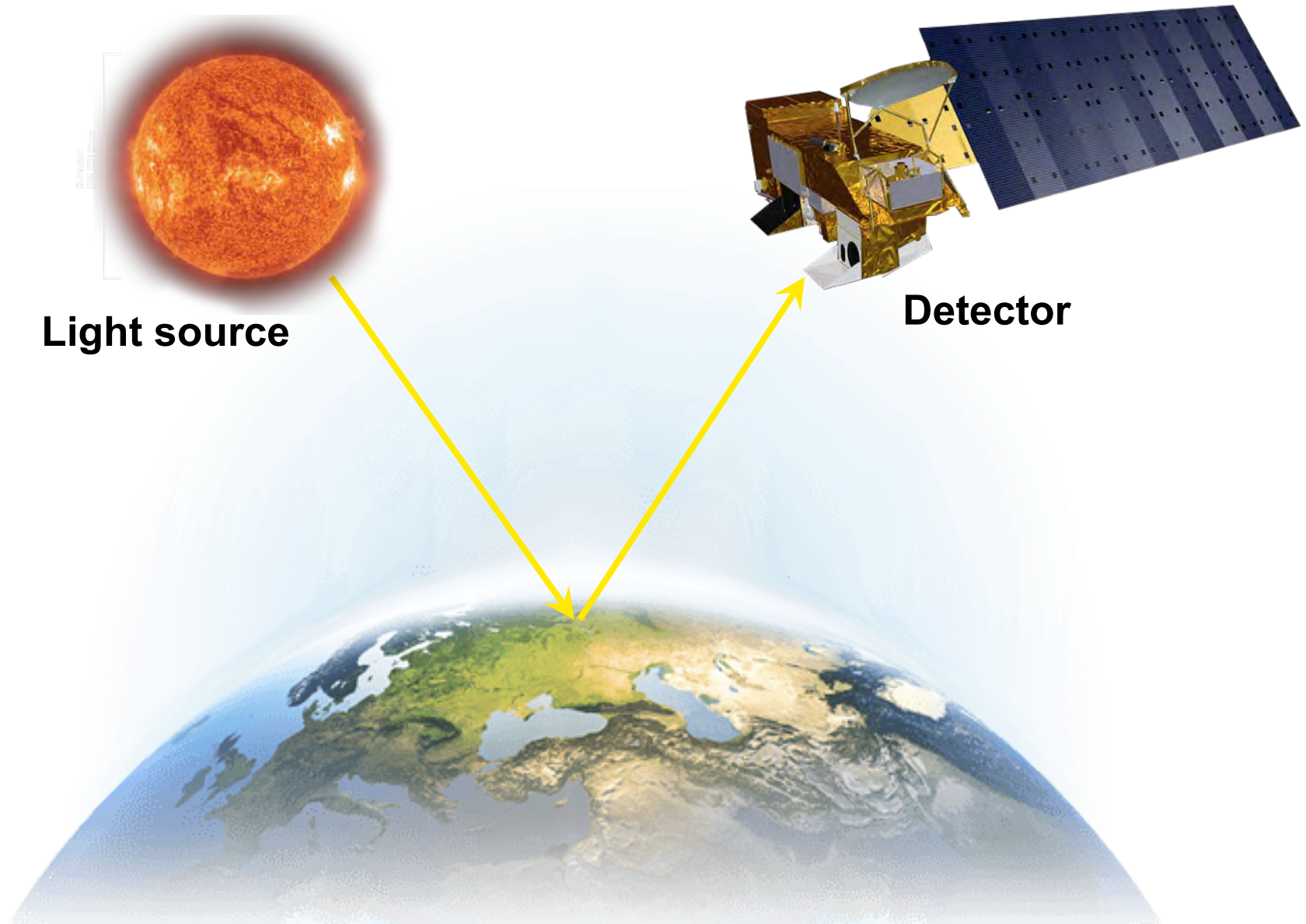
Spectrometers in Space



Spectrometers in Space



Spectrometers in Space



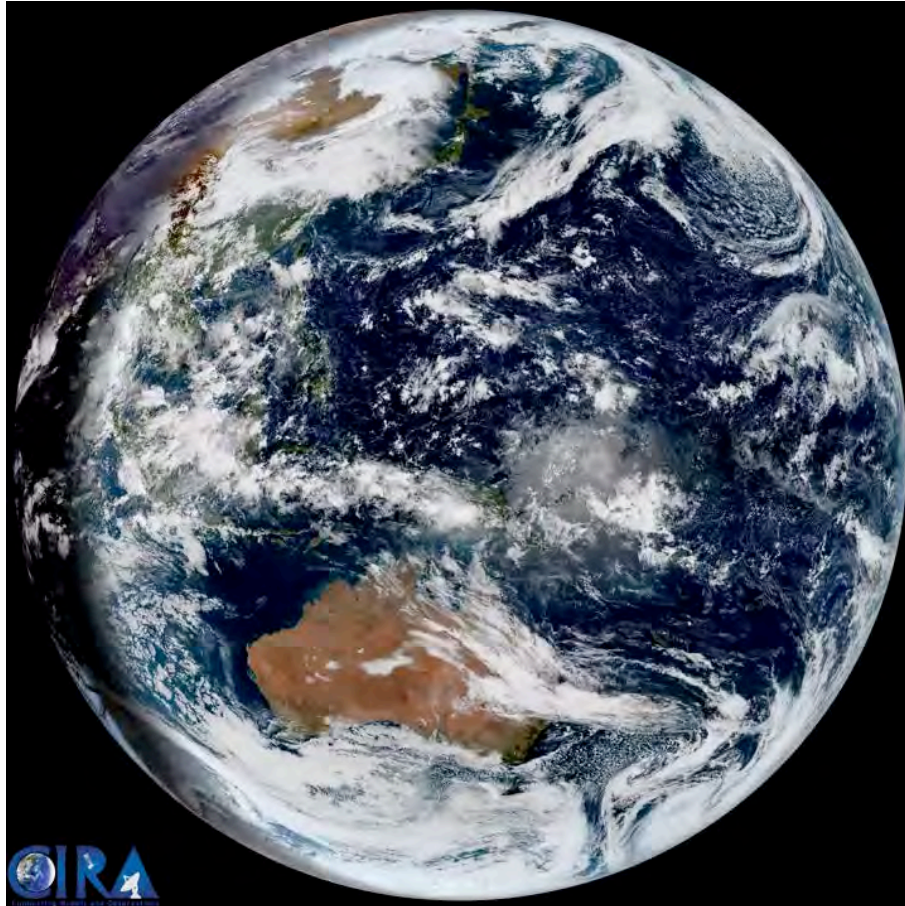
Spectrometers in Space

Low-Earth Orbiting Satellites

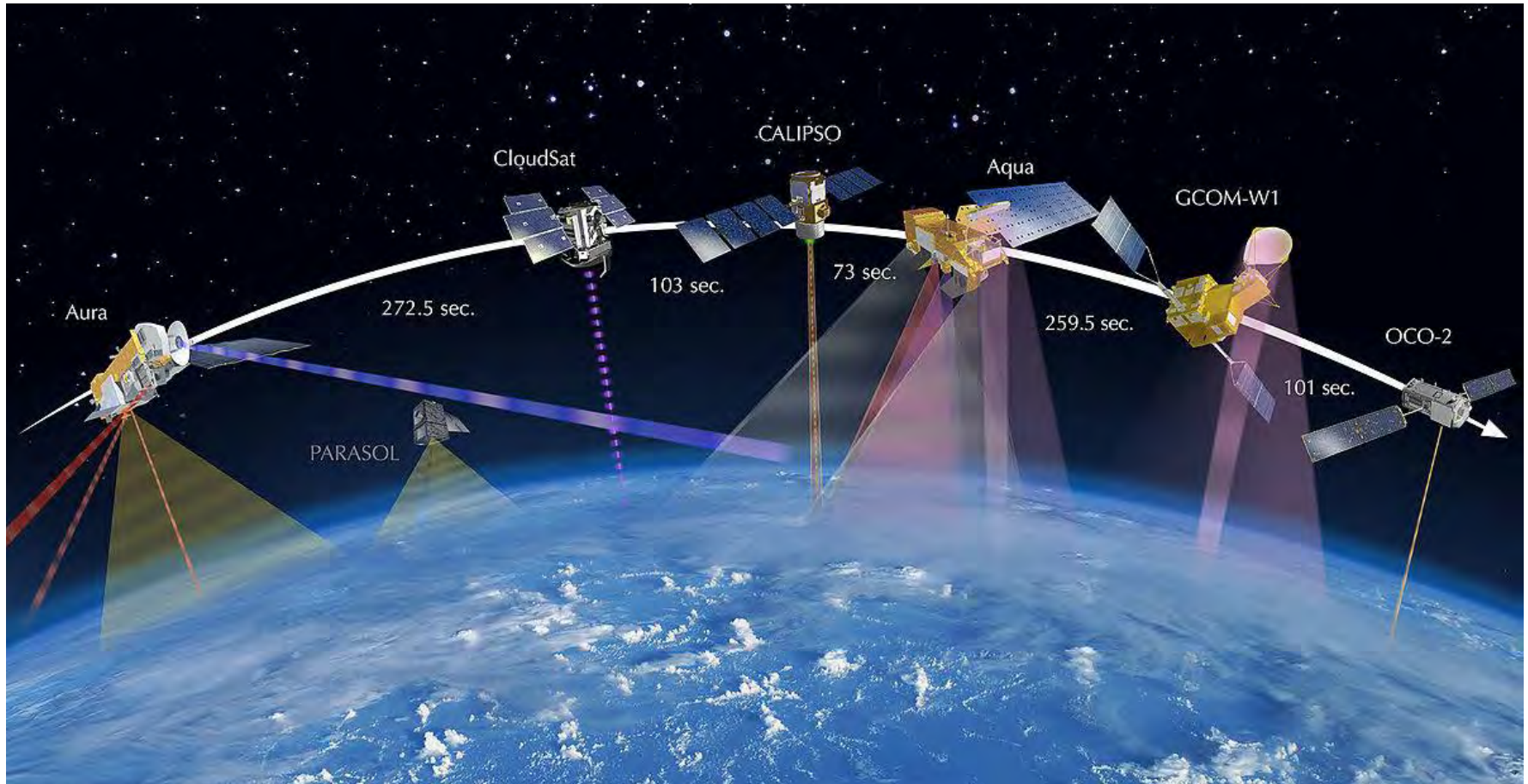


Spectrometers in Space

Geostationary Satellites

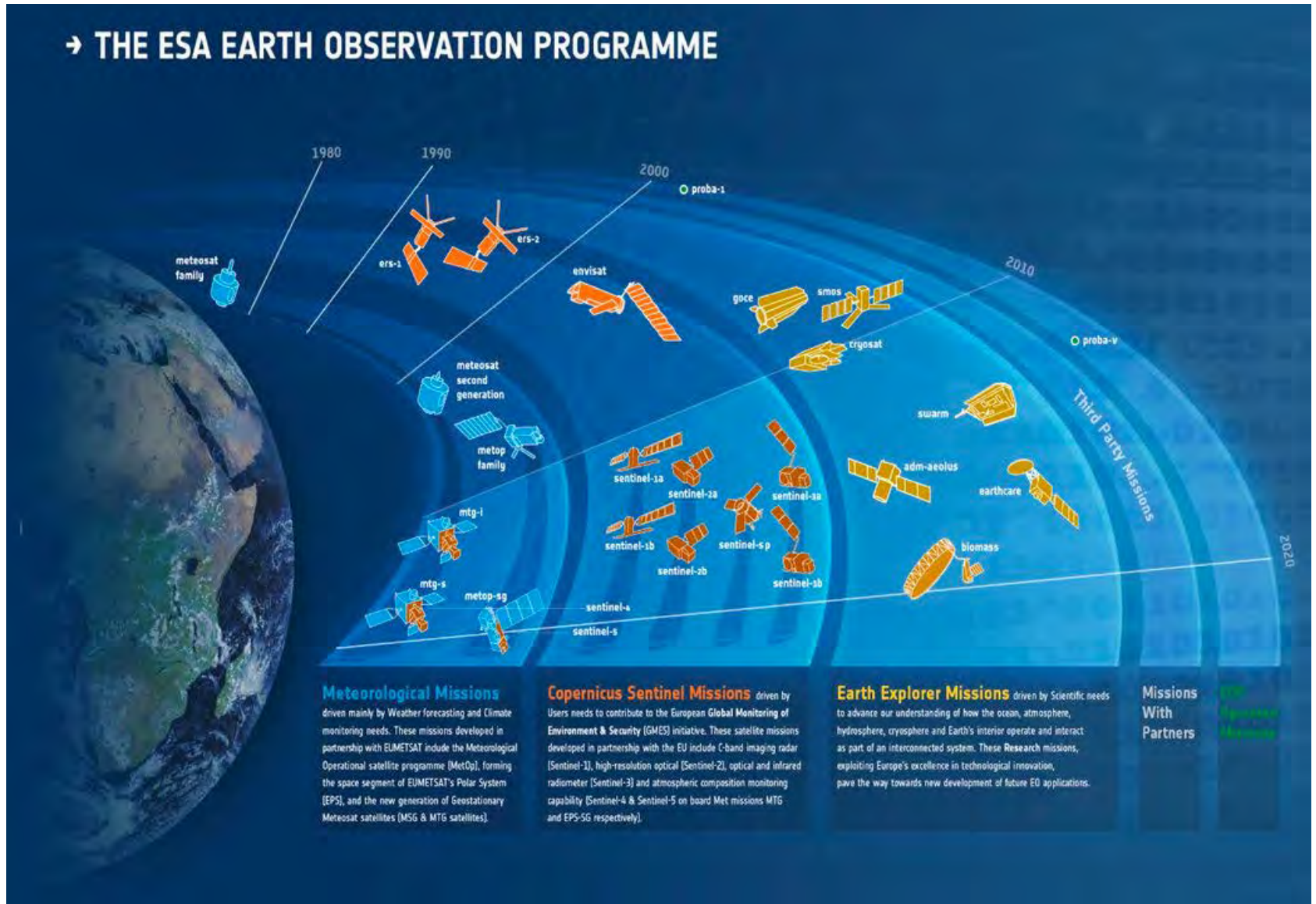


NASA Afternoon-Train (A-Train)



ESA Earth Observation Platforms

→ THE ESA EARTH OBSERVATION PROGRAMME



The Rest of the World

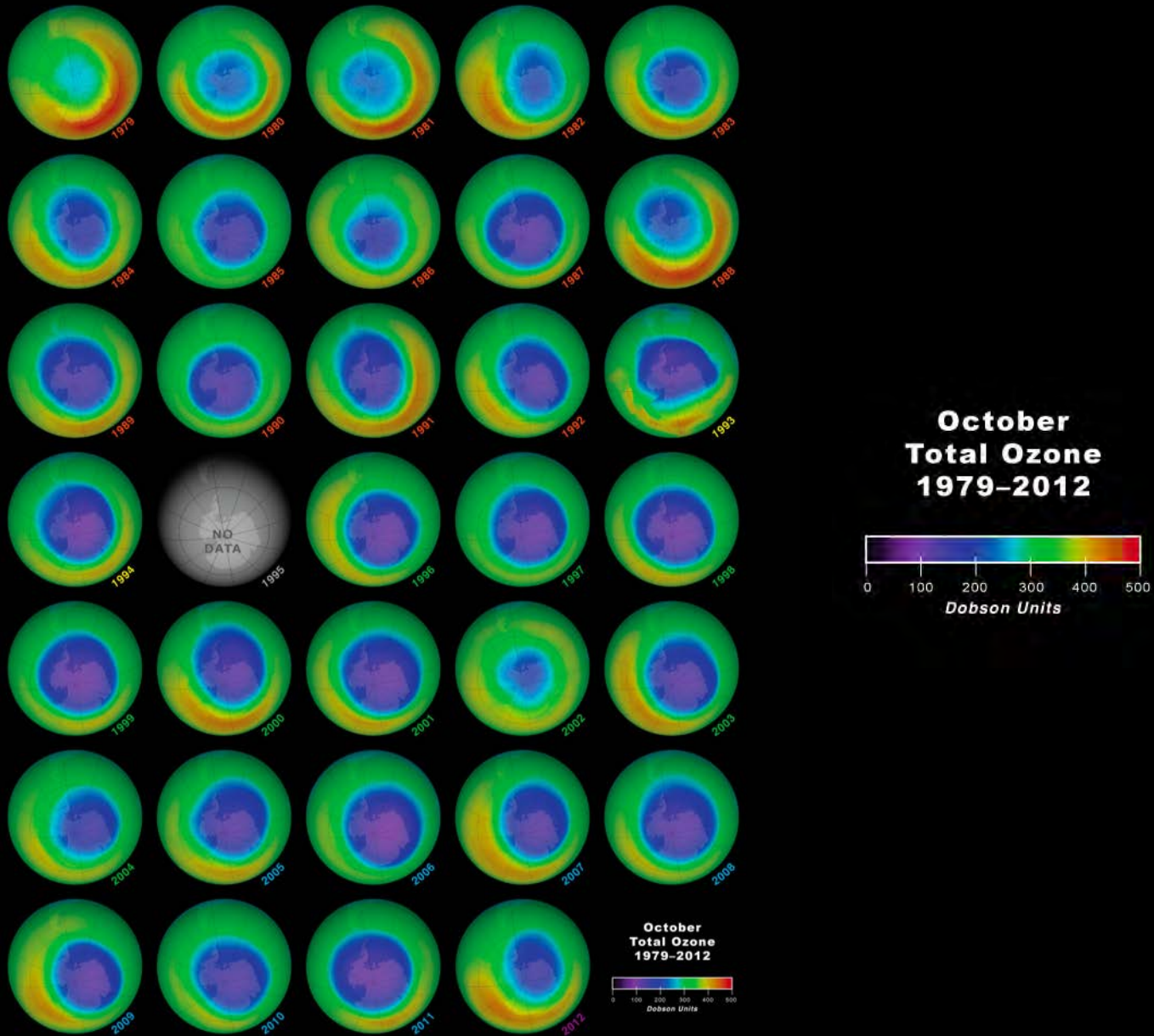


空へ挑み、宇宙を拓く

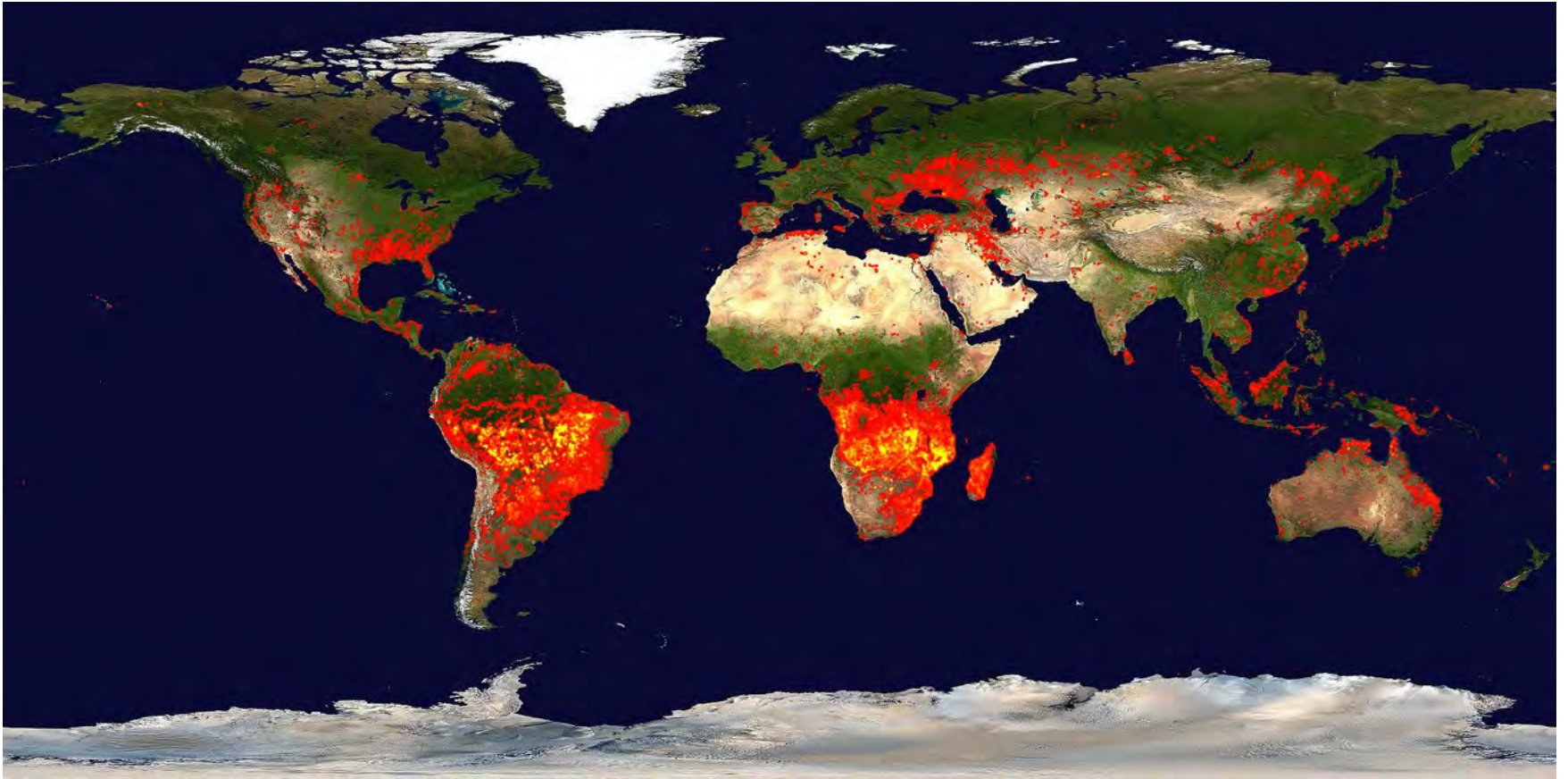


**Space-based observations have
contributed to understanding the
Earth system**

The hole in the ozone layer

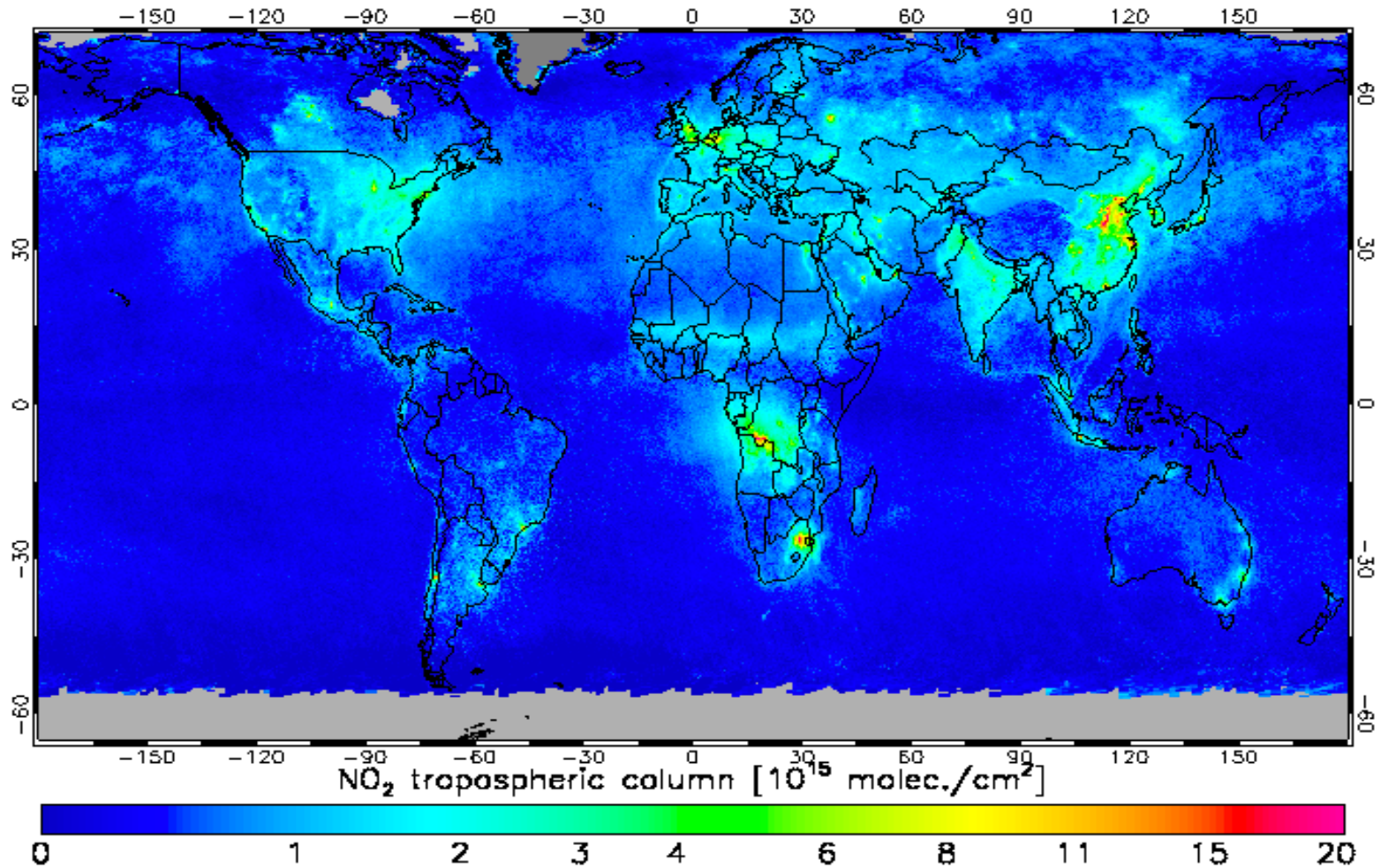


Wild and Agricultural Fires



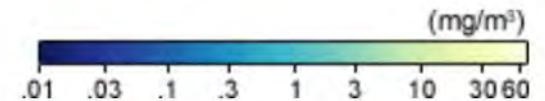
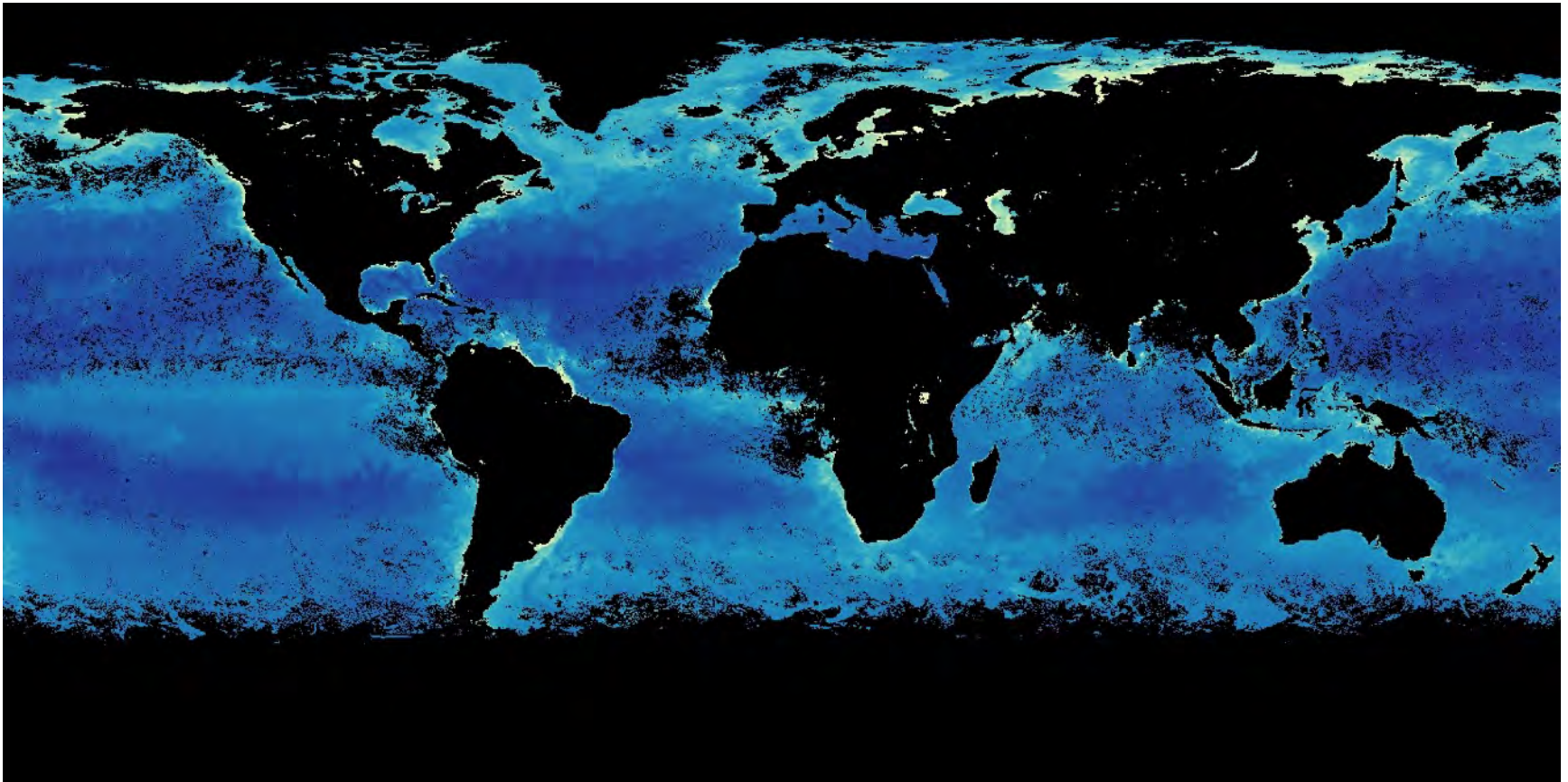
Fires in June-August 2010
(NASA MODIS sensor)

Air Pollution



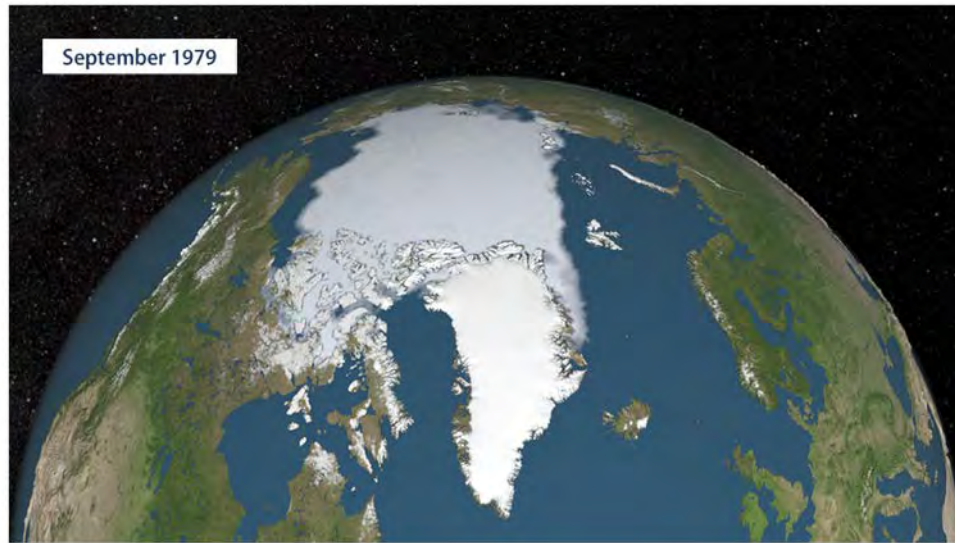
Nitrogen dioxide (NO₂) in June 2008
(KNMI/NASA OMI sensor)

Ocean Productivity



Chlorophyll content in August 2006
(MODIS sensor)

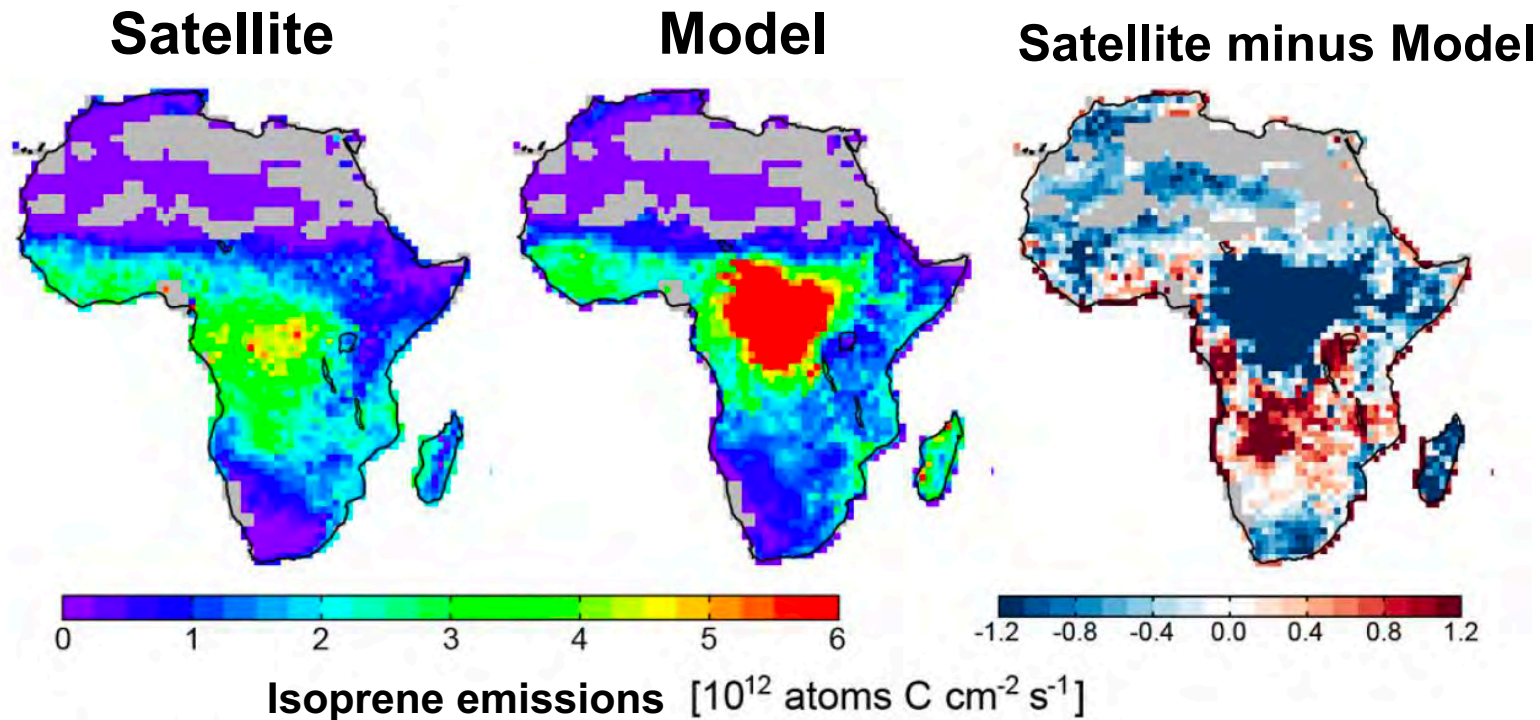
Arctic Sea Ice Extent



(passive microwave sensors)

Air Quality in Africa

Map pollution sources from satellites and compare to state-of-art models



Air Quality in Africa

Identify sources that contribute to severe ozone pollution in Nigeria

Seasonal open fires

CO + fires

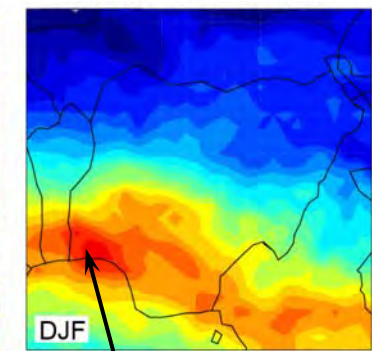
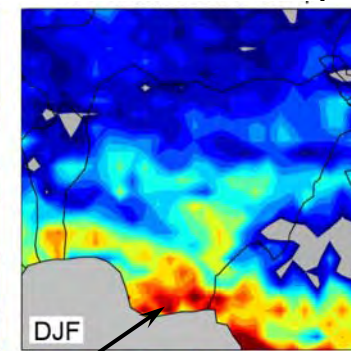
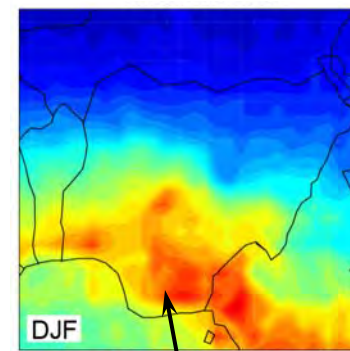
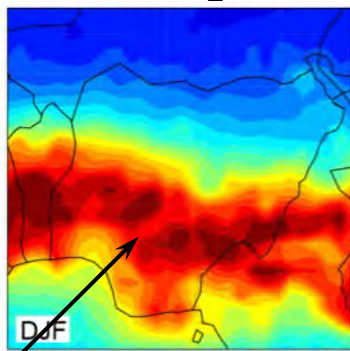
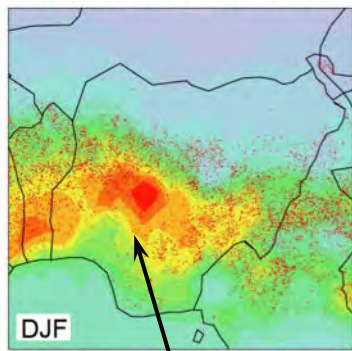
NO₂

Anthropogenic Volatile Organic Compounds

HCHO

Methane (CH₄)

Glyoxal



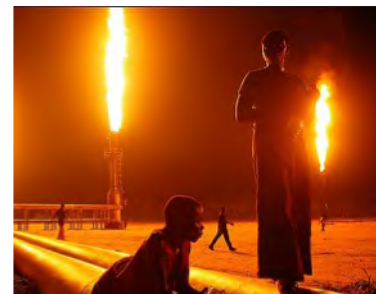
Open fires



Oil and Gas Industry



Ad-hoc oil refining



Gas Flares

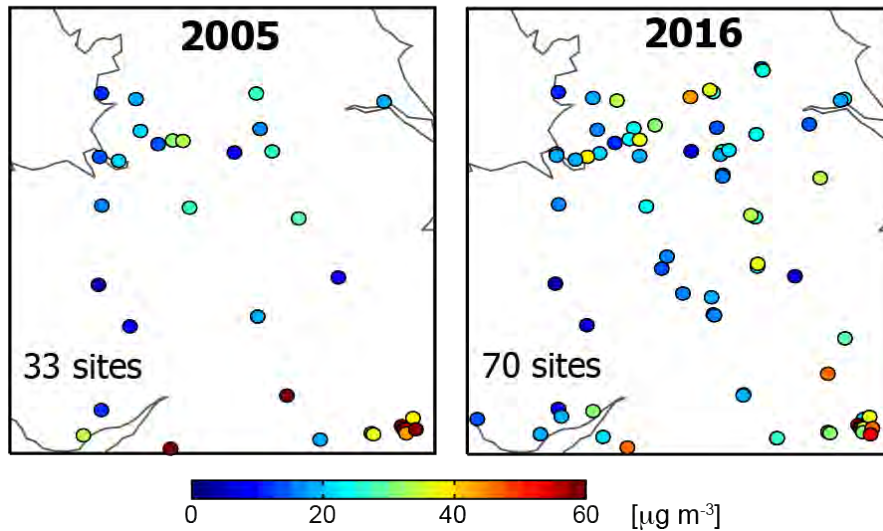
Traffic congestion



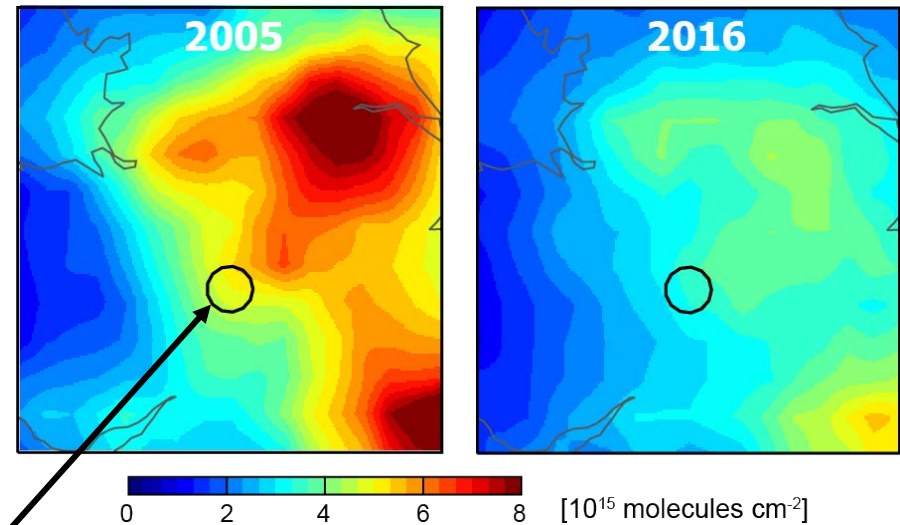
Tools to Monitor Air Quality

NO₂ is hazardous to health

DEFRA (surface) NO₂



Aura OMI (EO) NO₂



Birmingham: 3% per year decline in NO₂

Politicizing Earth Observations

News

Trump administration proposes 'privatising' International Space Station



Nasa is currently considering whether life of the International Space Station can be extended to 2028 CREDIT: NASA

By **Rob Crilly**, NEW YORK

11 FEBRUARY 2018 • 7:02PM

IN DEPTH CLIMATE CHANGE

NASA cancels carbon monitoring research program

Paul Voosen

See all authors and affiliations

Science 11 May 2018:
Vol. 360, Issue 6389, pp. 586-587
DOI: 10.1126/science.360.6389.586

Article

Figures & Data

Info & Metrics

eLetters

PDF

Europe's space agency braces for Brexit fallout

January 17, 2018 by Mari  tte Le Roux



Eyes in the sky: Cutting NASA Earth observations would be a costly mistake

The European Space Agency
the Earth's changing land

December 1, 2016 1:56am GMT



NASA Earth Science Division operating missions, including systems managed by NOAA and USGS. NASA Earth Observing System

Europe Takes the Lead

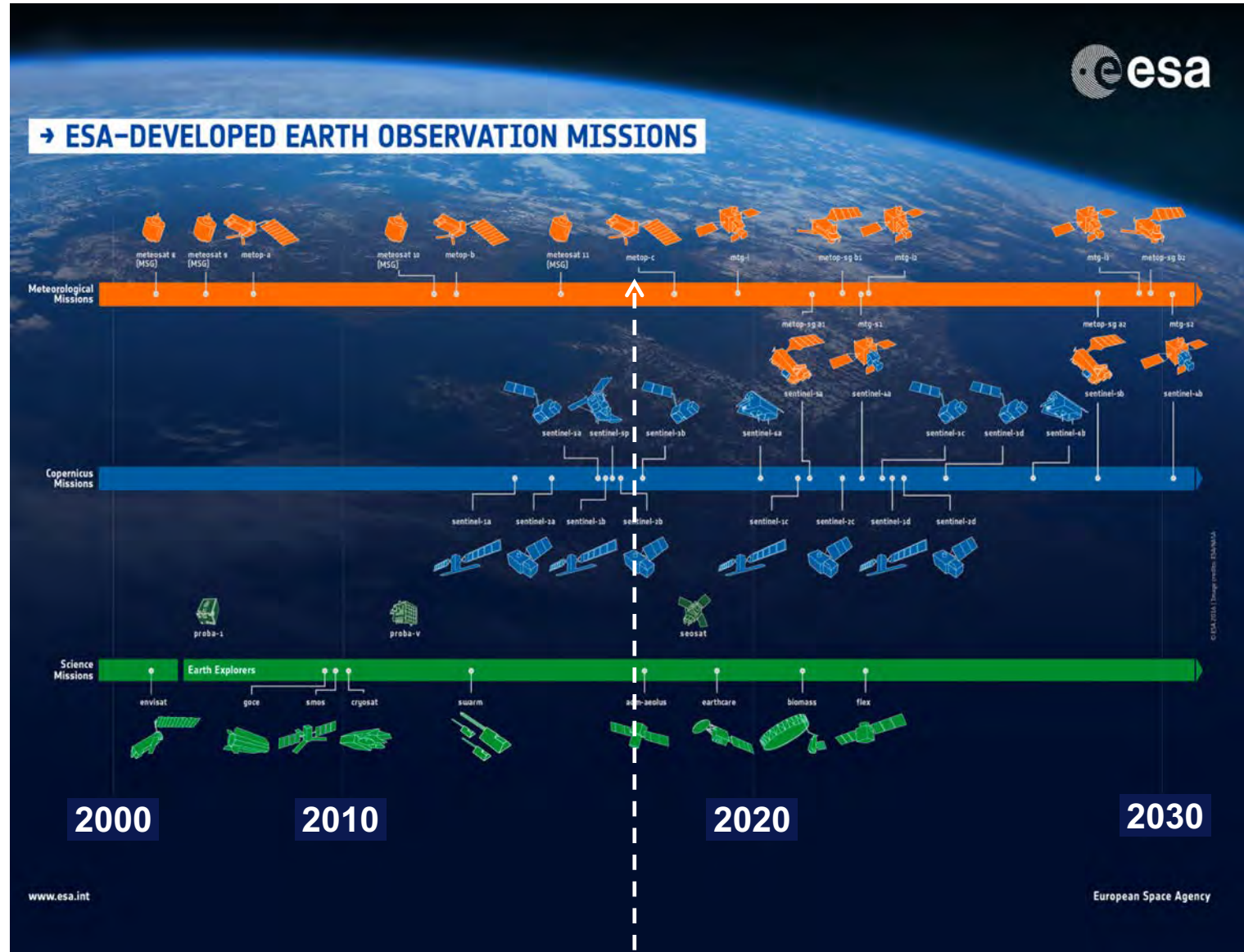
Op-ed | The golden age of European Earth observation

by Robbie Schingler and Agnieszka Łukaszczyk — November 6, 2017



An image of Paris taken by a SkySat satellite, operated by Planet, in August 2017. Credit: Planet

Europe Takes the Lead



2018