



MINISTÉRIO DA CIÊNCIA E TECNOLOGIA
INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS



CEOS space agencies: support for climate observations

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What is CEOS?

CEOS Committee on Earth Observation Satellites



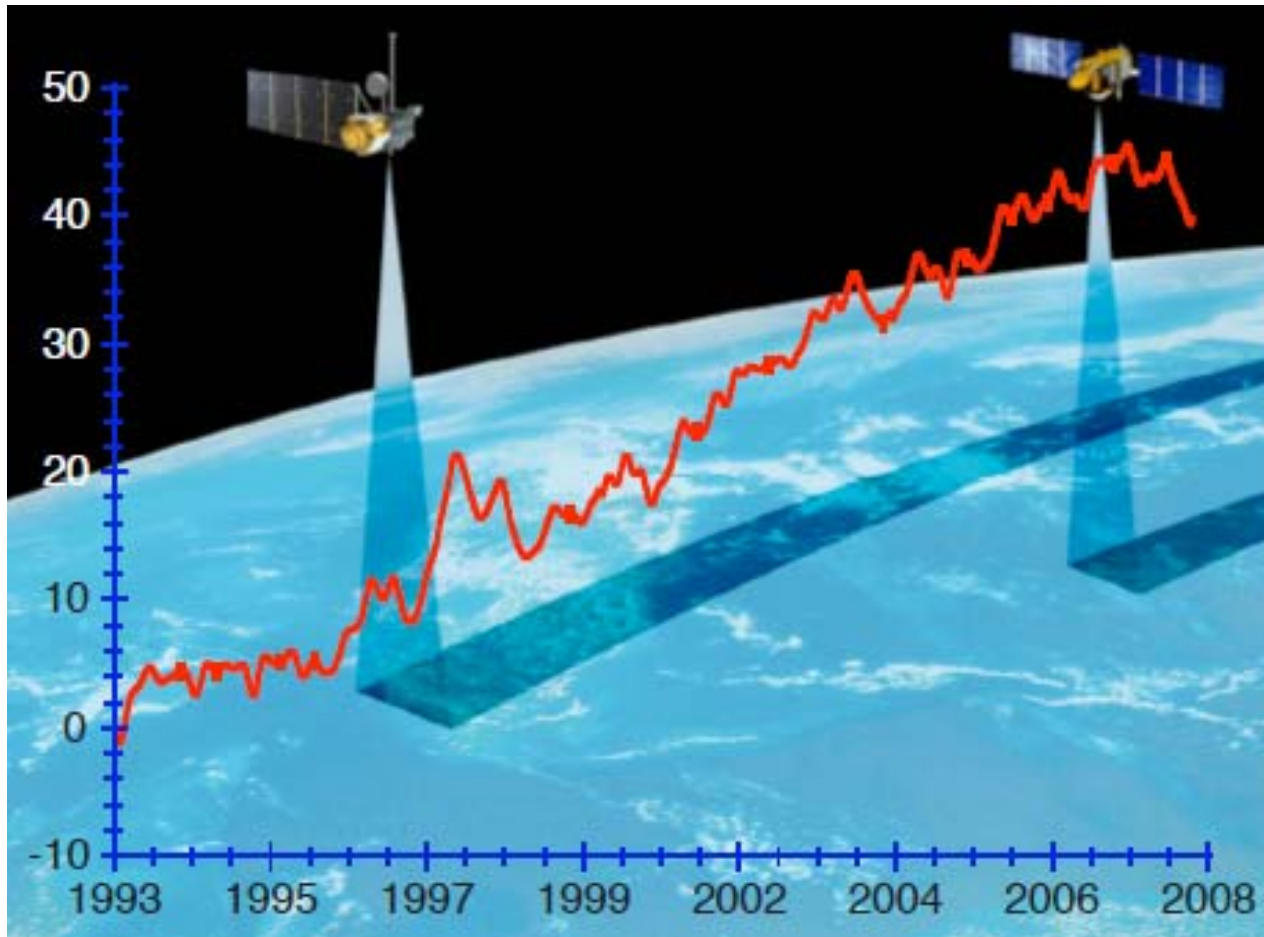
28 space agencies



**World
Meteorological
Organization**
Weather • Climate • Water

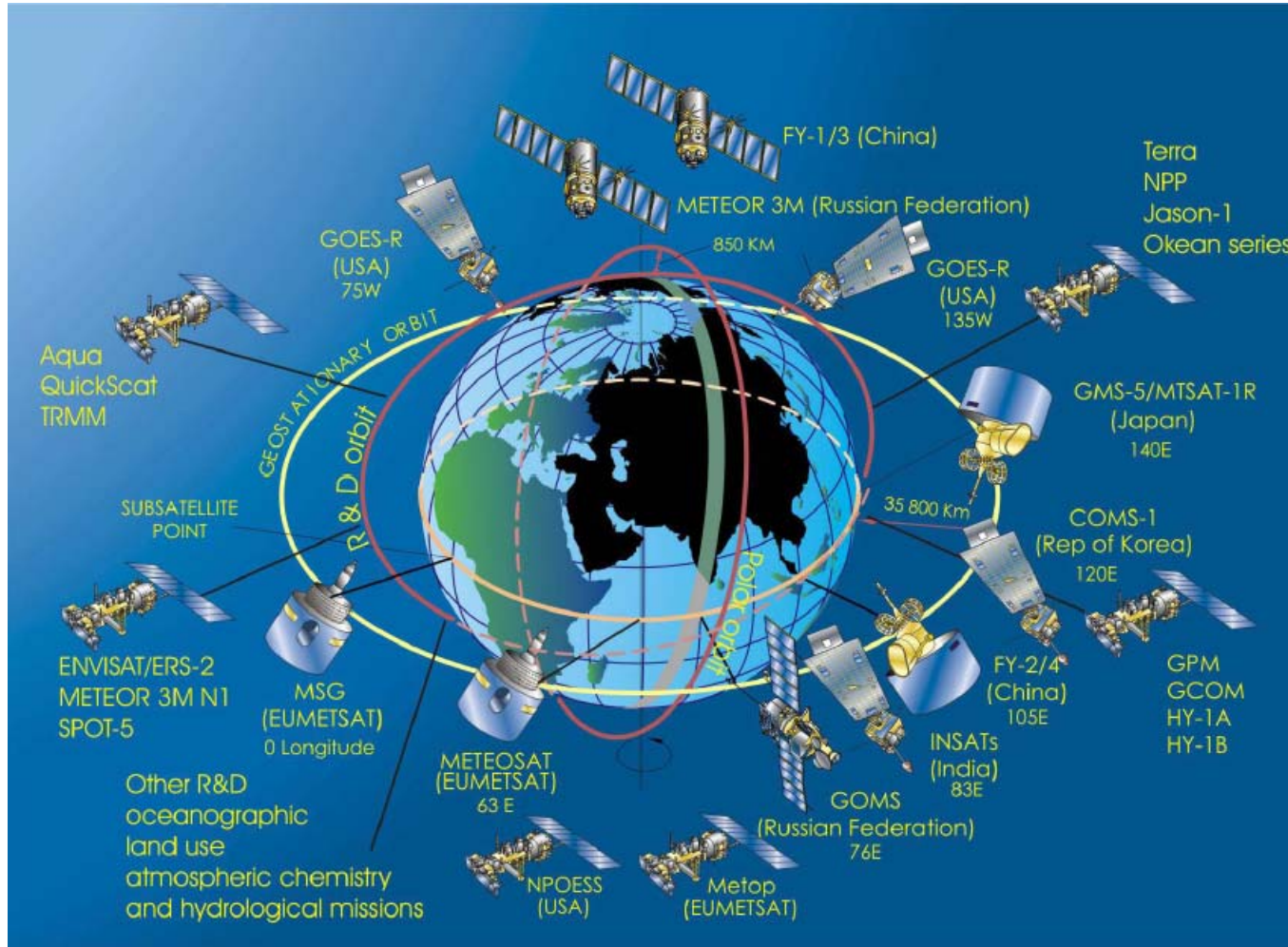
20 participating organizations

What has changed in the vision of the space agencies?



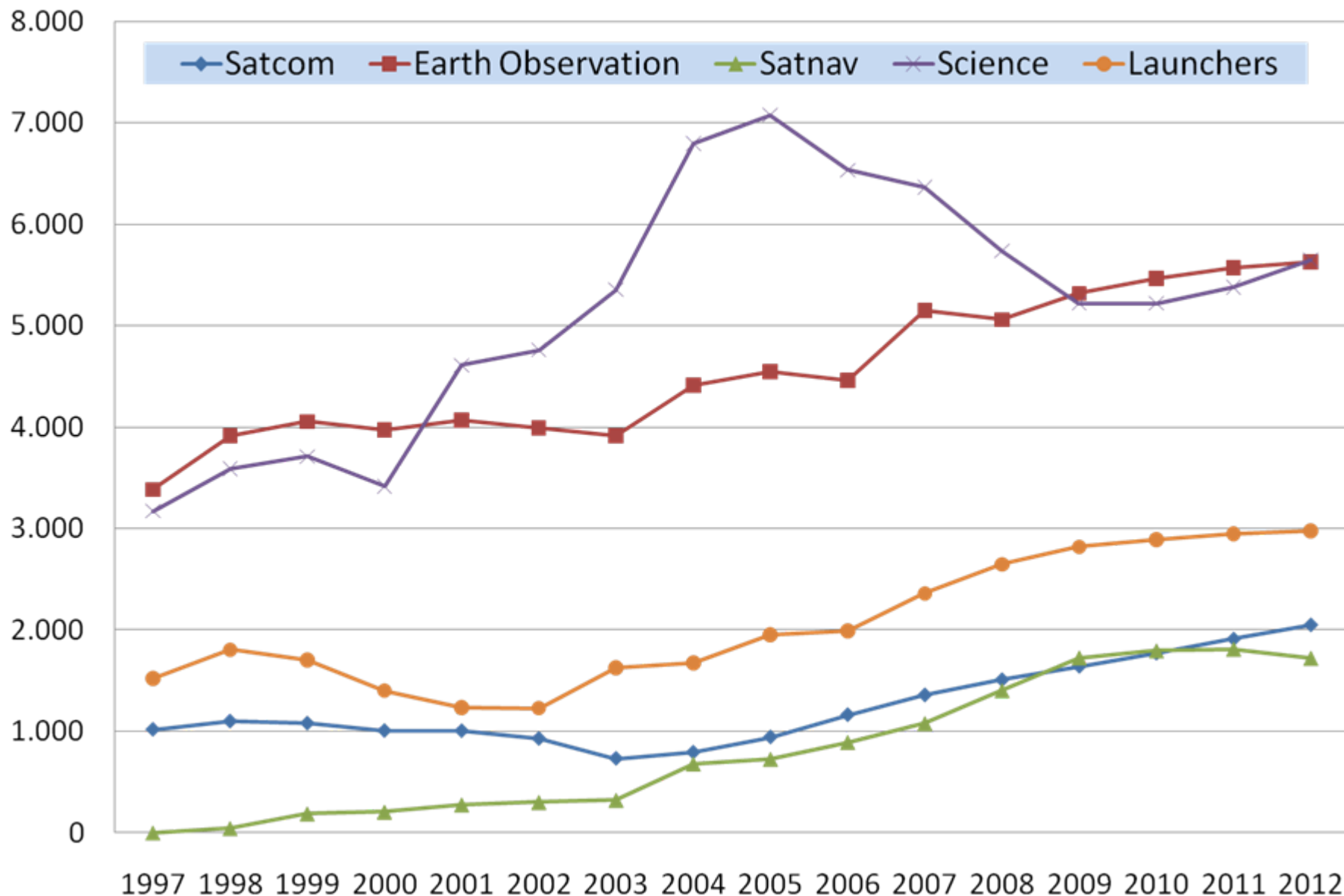
Need for continuous, operational surveying of climate and terrestrial variables

What has changed in the vision of the space agencies?

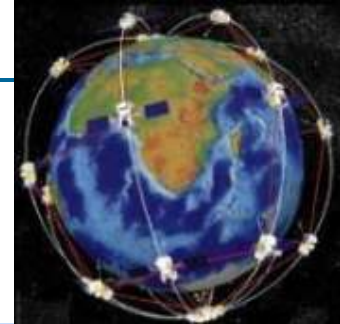


Need to coordinate Earth observation programmes and ensure interoperability

World Government Space Programs (million USD)



Earth observation and scientific programs dominate public R&D investment for non-manned space programs



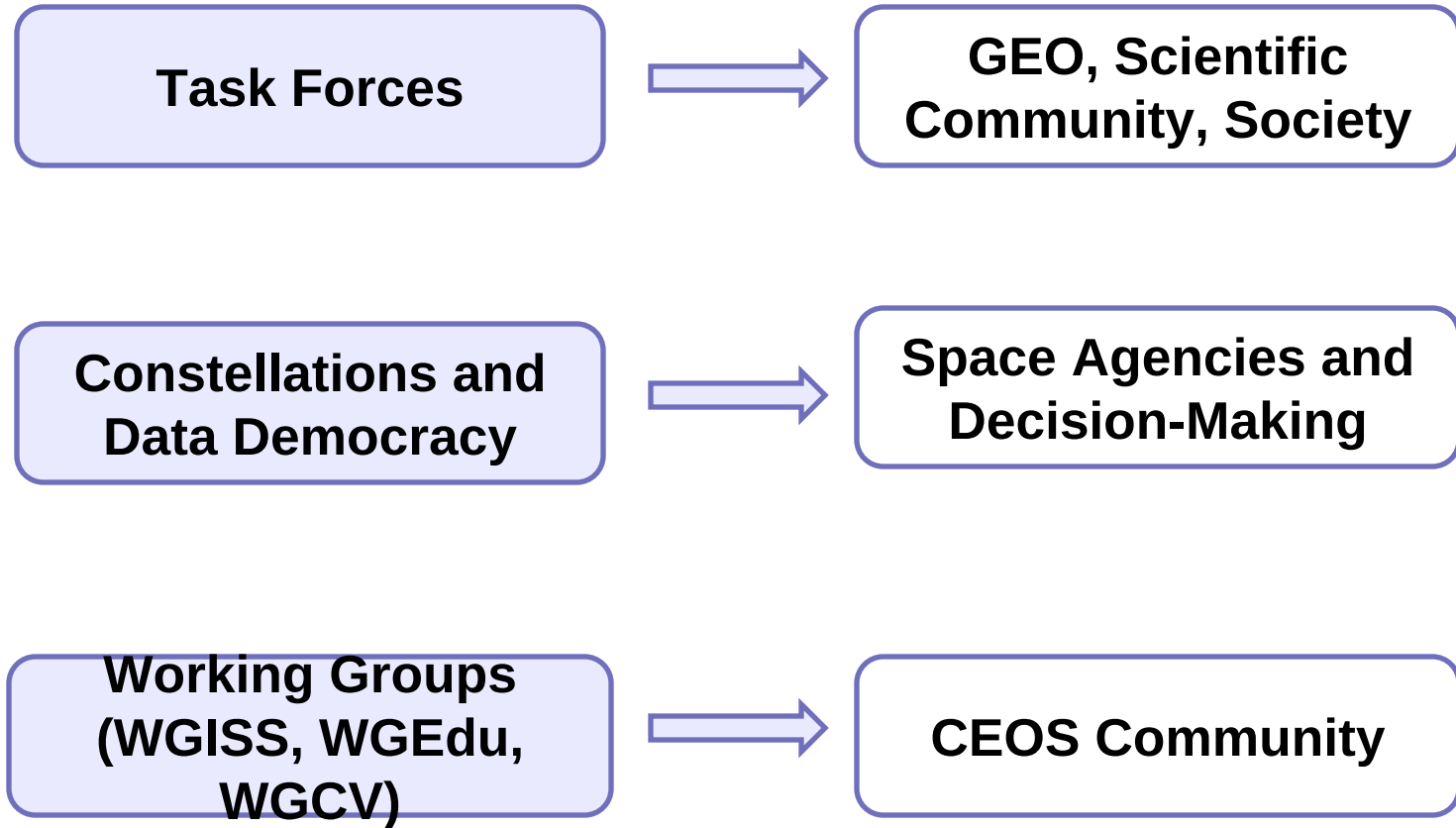
CEOS Virtual Constellations

Common requirements, independent satellites, compatible data
(CEOS – Committee on Earth Observation Systems)

Atmospheric Composition Air quality, CO ₂	Land Surface Imaging ecosystem monitoring
Ocean Surface Topography climate variability	Precipitation weather forecasts
Ocean Color Radiometry marine ecosystems	Ocean Surface Vector Wind



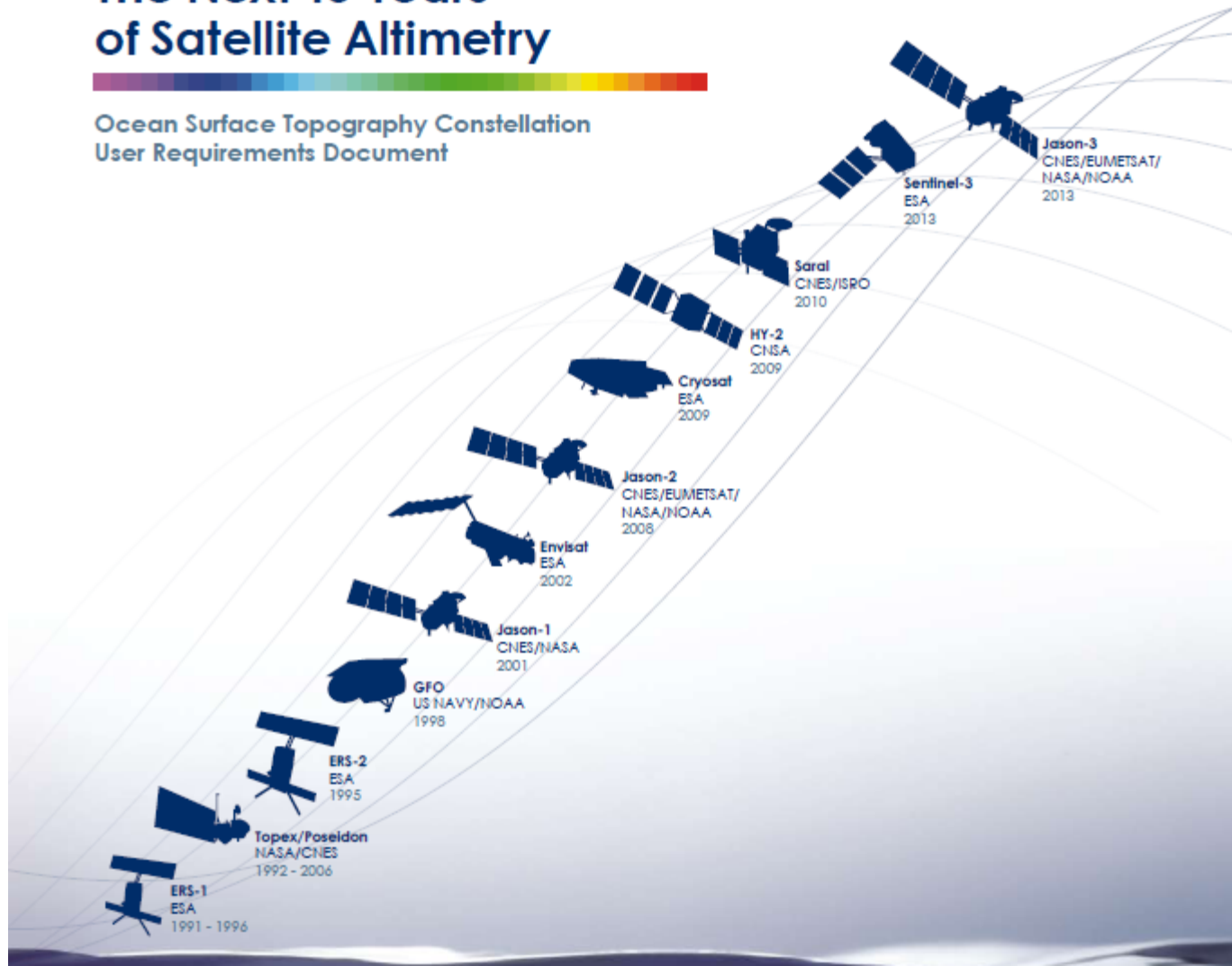
A Vision for CEOS



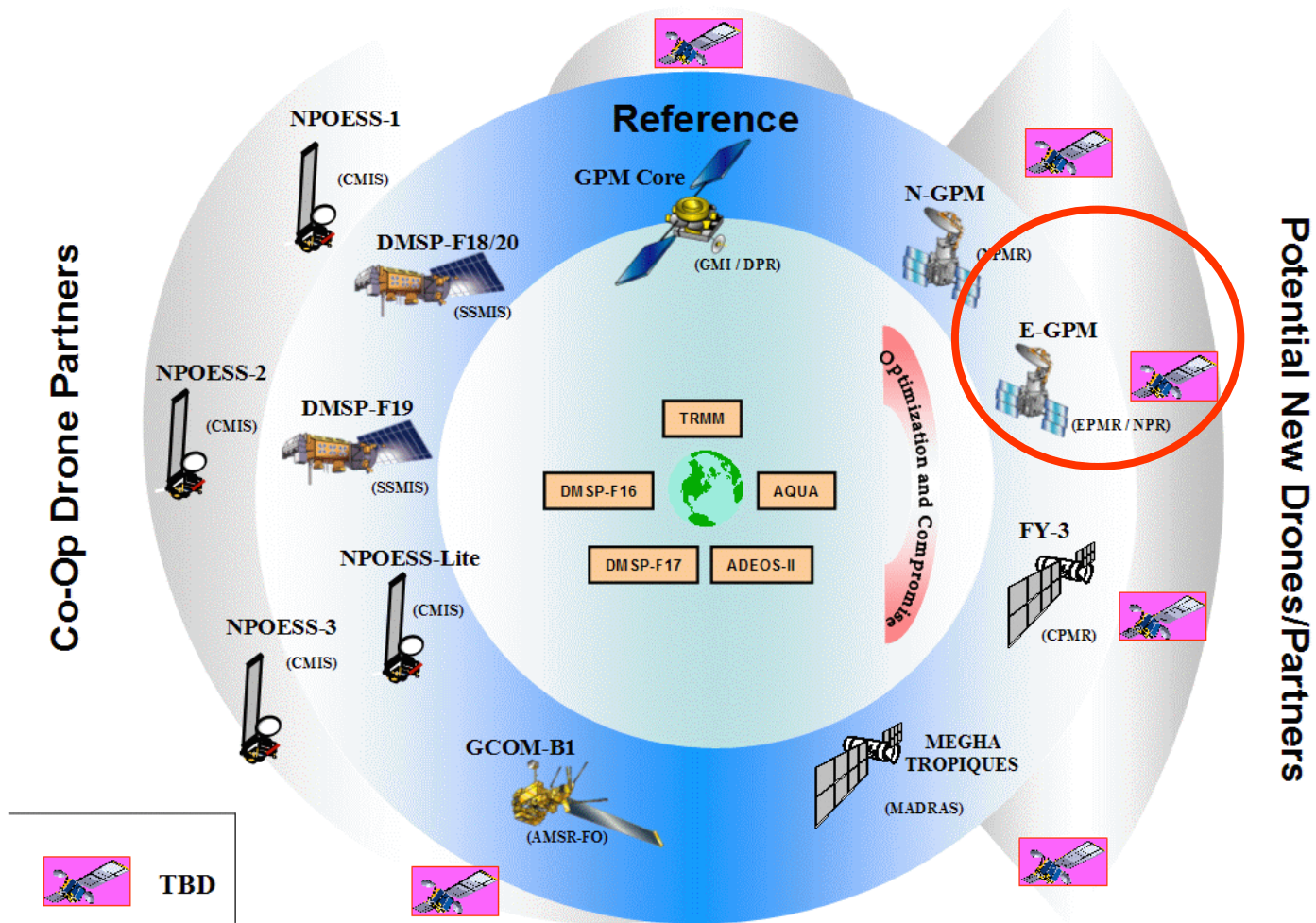
Ocean surface topography constellation

The Next 15 Years of Satellite Altimetry

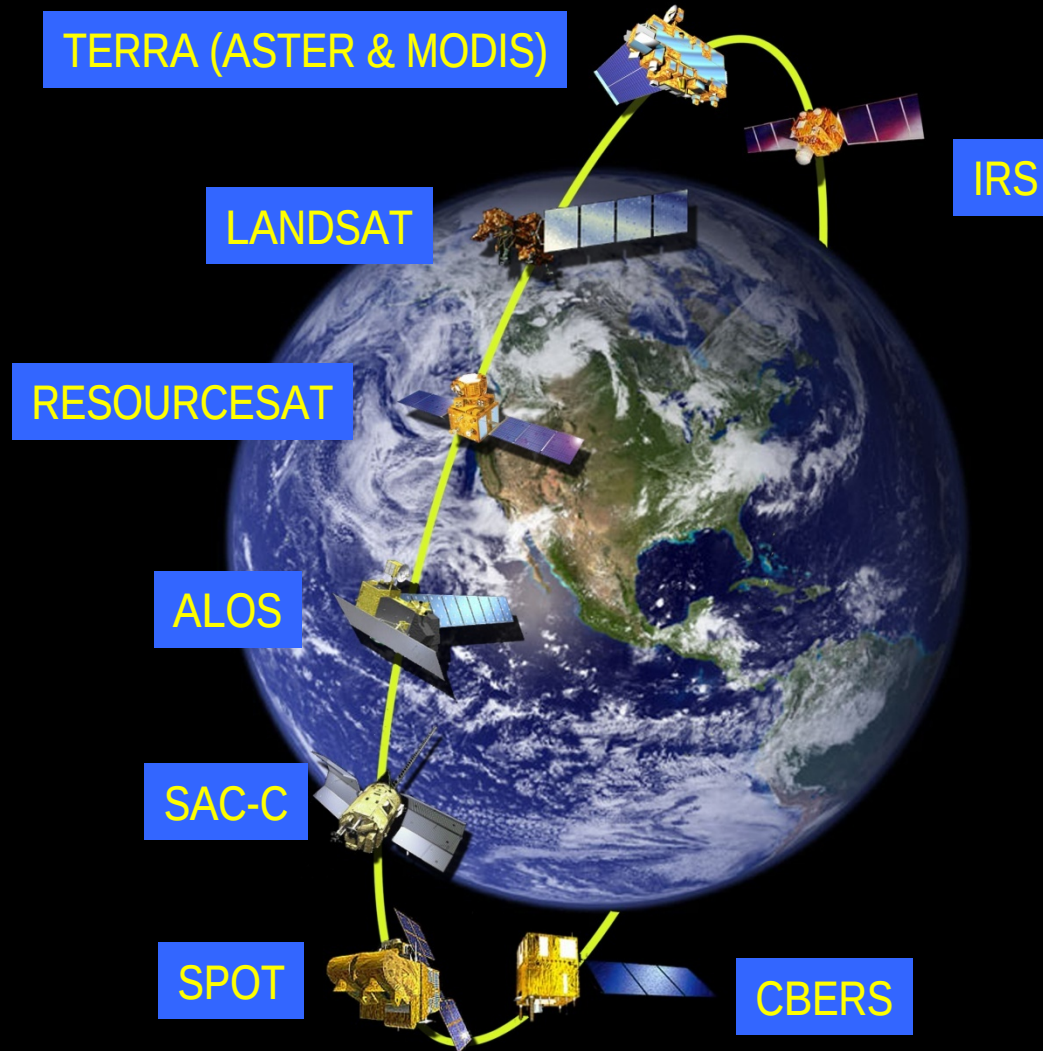
Ocean Surface Topography Constellation
User Requirements Document



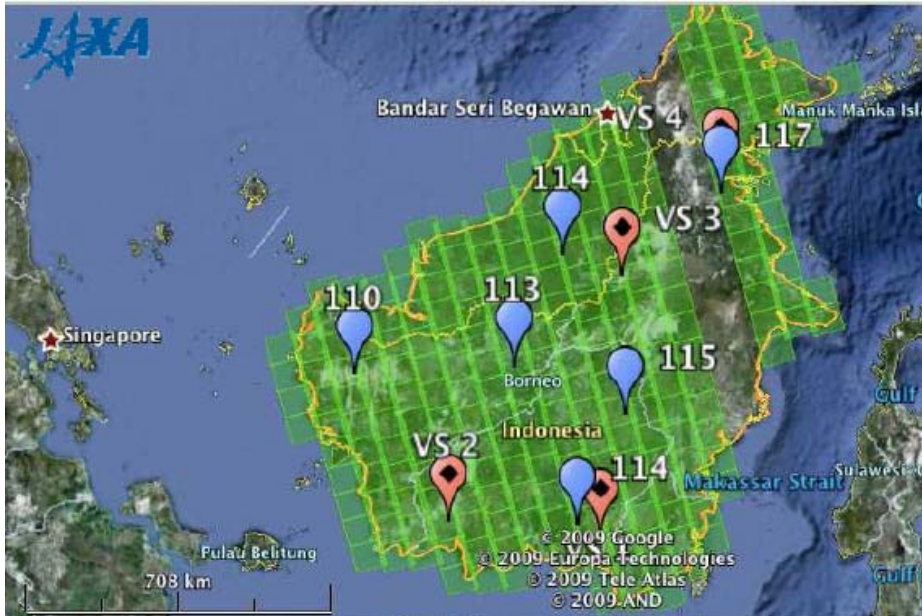
Global Precipitation Constellation



Land Surface Imaging Constellation



Forest Carbon Tracking – Task Force



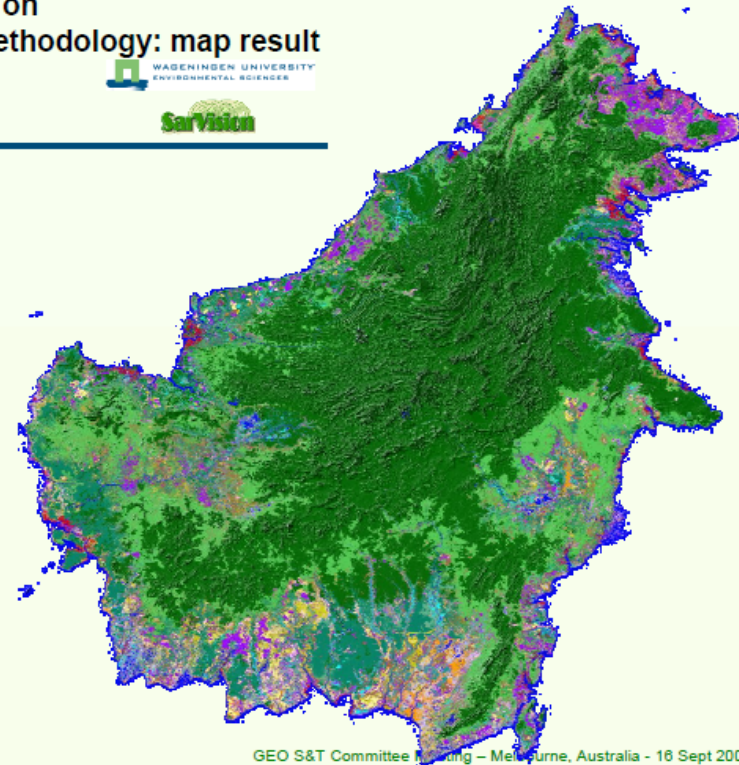
CSIRO, JAXA, NSC,
GOFC, INPE

ends on
g methodology: map result



Is it feasible to
monitor the
world's tropical
forests?

LULC classification Borneo



Open access data policies: a qualified success



CBERS@INPE:
1 million images (2004-2009)



LANDSAT @USGS:
1 million images (Jan-Aug-2009)



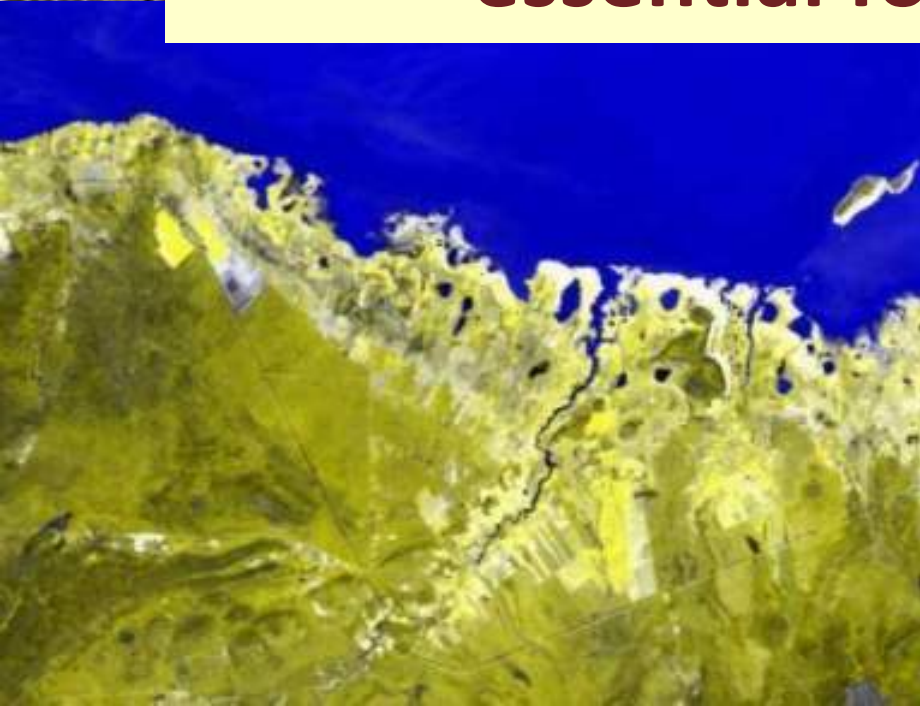
GMES Sentinels @ESA-EC:
Data will be open access (Sep 2009)

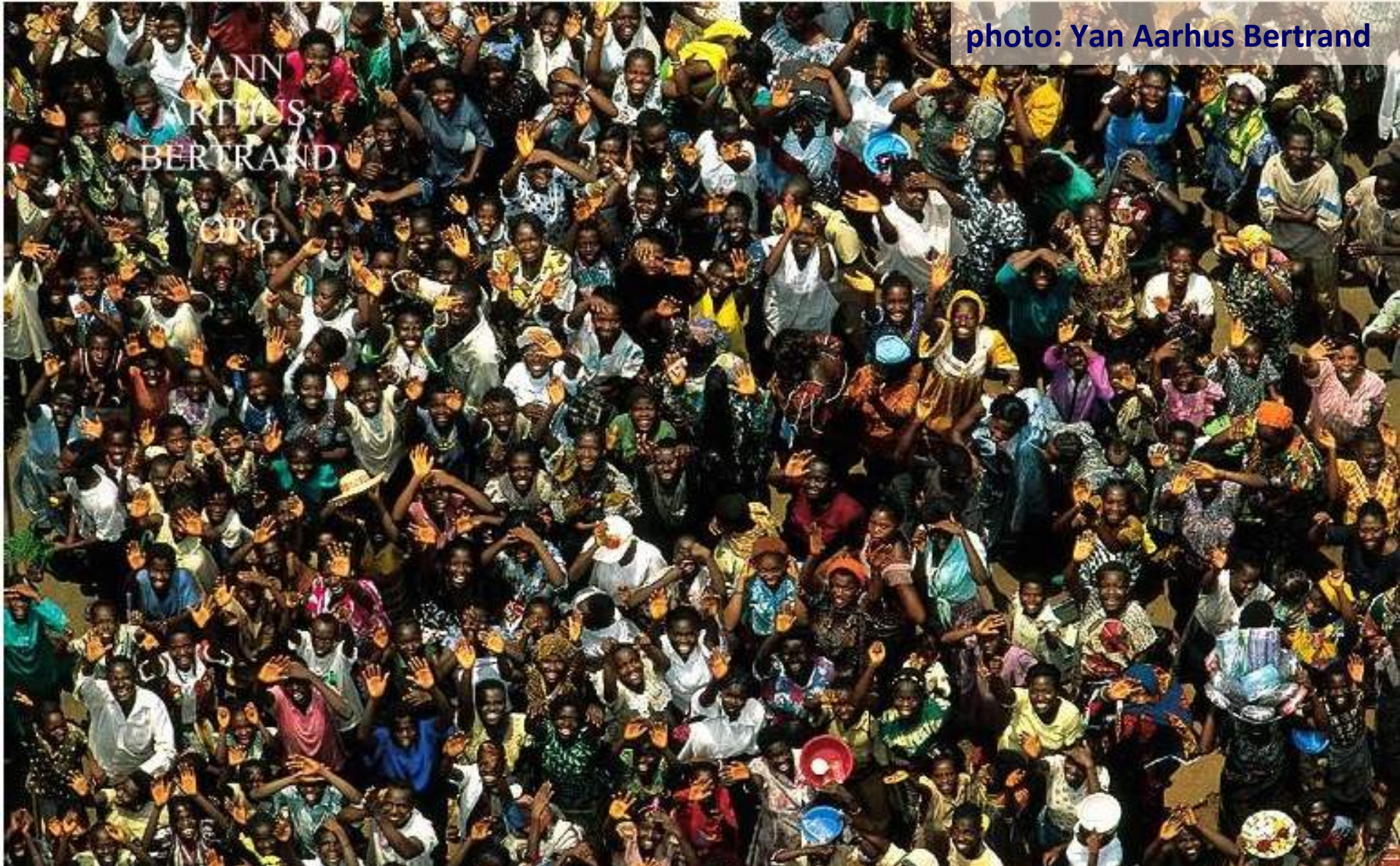
Data for the world's tropical areas



Global satellite data in 5 meter+ will be free
Concerted action needed with benefits to all involved

We know earth observation data is essential for the planet...





... but data democracy needs to reach the masses