Current & Future ESA Earth Observation Missions and Programmes

CGMS-46
7 June 2018

Ivan Petiteville, ESA
Earth Observation Programmes
ESA-DEVELOPED
EARTH OBSERVATION MISSIONS

Satellites
28 under development
13 in operation

Science
Copernicus
Meteorology
Successful Launch Sentinel-5P

13 October 2017 - 11:27 CEST
Rokot Launcher, Plesetsk Cosmodrome
Sentinel-5P ‘First Light’

NO$_2$ Concentration
Launch Sentinel-3B

Plesetzk
25 April 2018
First Image Ocean and Land Colour Instrument
7 May 2018
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The real number of users is much higher but unknown due to the free, full & open data policy.

Registered Sentinel Users

Copernicus User Uptake
Sentinel Open Access Data Hub

Volume of User Downloads
62.1 PB

Published Products
8,087,411

Registered Users
145,506

Open Access Hub Availability in the past month
99.4%

Statistics on 24 May 2018

scihub.copernicus.eu
Sentinel Expansion (7 to 12)

High Priority Candidate Missions

- Anthropogenic CO₂

Applications

- Climate Change (Causes)
- Climate Change (Effects)
- Sea Surface Temperature & Sea Ice Concentration

Status: Phase A/B1 system studies

- Passive Microwave Imaging
- Polar Ice & Snow Topography
Sentinel Expansion (7 to 12)

**High Priority Candidate Missions**
- High Resolution
- Land Surface
- Temperature

**Applications**
- Agriculture & Urban Management Services
- Agricultural Management & Food Security, Soil & Mineral Resources
- Soil, Vegetation, Food Security & Ground Motion

**Status:** Phase A/B1 system studies
Aeolus Launch 21 Aug. 2018

Wind Mission
First ever UV LIDAR in Space
Earth Explorer 9 and beyond

Earth Explorer 9: launch around 2025

FORUM
Greenhouse Effect / Climate Change

SKIM
Ocean Surface Currents

Earth Explorer 10

• 21 proposals under evaluation
• 3 candidates for Phase 0 selection in September 2018
NO$_2$ over India
Sentinel-5P

17-28 Febr. 2018
©KNMI/NSO/ESA
Methane – Global View

Sentinel-5P
Average 12 Nov. - 30 Dec. 2017

© Hu et al., GRL 2018
Sentinel-5P – New Data

NO₂ Concentrations
Strait of Gibraltar

Sentinel-5P
20 February 2018

© KNMI / NSO / ES
SMOS: Sea Ice Thickness

Opening of sea ice

28 January 2018

28 February 2018
Glacier Decline
Cryosat – 2018

© Planetary Visions
Cryosat: Land Ice Melting

Shifting Grounding Lines

Based on CryoSat data over six years (2010 – 2016)

© CPOM/Leeds/ESA
New Meteorological Systems

MTG
- MTG-I CDR remains on schedule to start Q4/2018
- Stable FAR predictions:
  - MTG-I-1 Dec. 2020
  - MTG-S-1 Aug. 2022

MetOp-SG
- Cycle of Platform lower level / equipment CDRs is nearing completion
- Satellite A launch date in Q4 2022
- Satellite B schedule remains Dec. 2022
Climate Change Initiative Extension – CCI+

New CCI subscriptions at CM-16
83M€ for 2017-2024 period

ITTs for CMUG, new R&D on existing ECVs and Knowledge Exchange released in Q1 2018

Cross-ECV Scientific Exploitation

Aerosol, Cloud, CO2 & CH4, Ozone, SST, Ocean Colour, Sea Level, Sea Ice, Glaciers, Ice Sheets, Land Cover, Fire, Soil Moisture

Ground Biomass, Permafrost, Land Surface Temperature, Water Vapour

Knowledge Exchange

New ECVs

Resilience Land Cover, Snow, Lakes, Above-Ground Biomass, Permafrost, Land Surface Temperature, Water Vapour

R&D on CCI ECVs
Atmospheric Carbon Dioxide (ECV)

+9% ppm in just 15 years time

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Thank you for your attention!

www.esa.int