Sentinels – providing operational EO Data Continuity

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UNFCCC COP-16

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2 December 2010

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GMES dedicated missions: Sentinels

Sentinel 1 – SAR imaging
All weather, day/night applications, interferometry

2012 (A), 2014+ (B)

Sentinel 2 – Multispectral imaging
Land applications: urban, forest, agriculture,..
Continuity of Landsat, SPOT

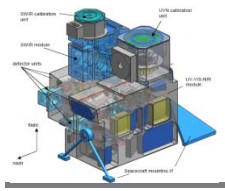
2013 (A), 2015+ (B)

Sentinel 3 – Ocean and global land monitoring
Wide-swath ocean colour, vegetation, sea/land surface temperature, altimetry

2013 (A), 2015+ (B)

Sentinel 4 – Geostationary atmospheric
Atmospheric composition monitoring, trans-boundary pollution

2018



Sentinel 5 and Precursor – Low-orbit atmospheric
Atmospheric composition monitoring

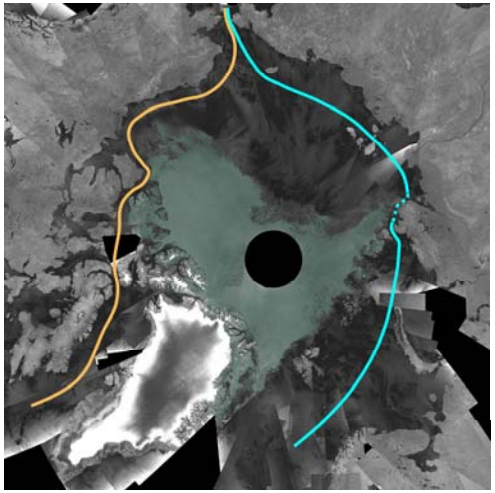
2014 (5P), 2019

Sentinel–1: C-band SAR Mission

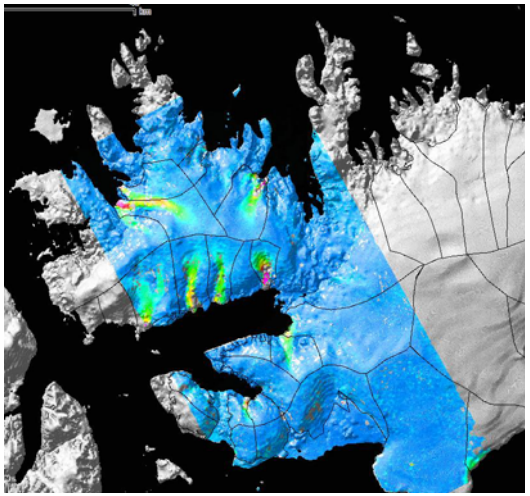
- Applications:
  - ice, marine and land monitoring
  - rapid mapping in crisis situations

- 4 operating modes with 5 to 40 m resolution
- Swath width 80 – 400 km
- 12-day repeat cycle (with 2 satellites: 6 days)
- Sun synchronous orbit at 693 km mean altitude
- 2300 Kg spacecraft mass
- 7 years design life time, consumables for 12 years

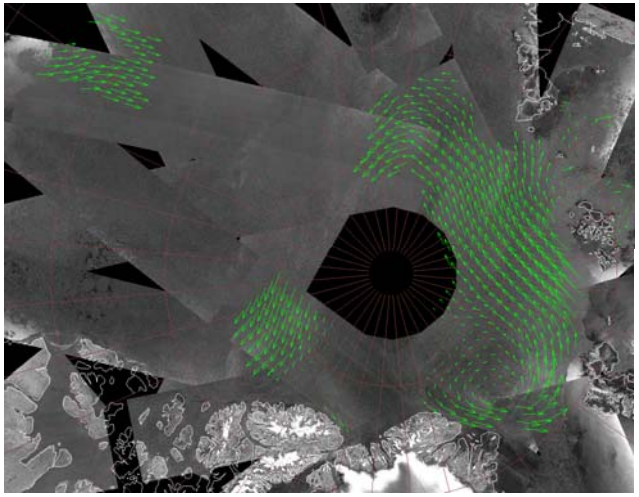
Sentinel–1 Applications



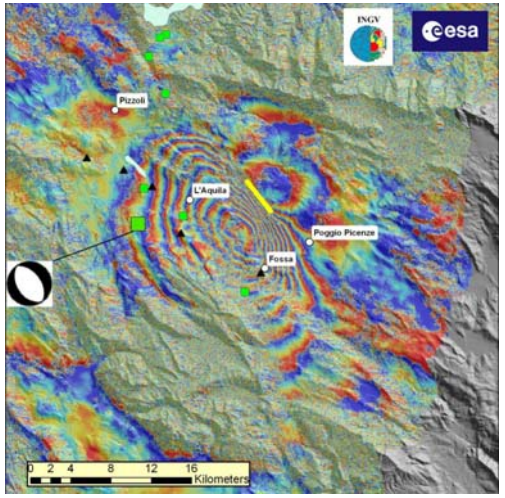
- Sea ice extend



- Glacier velocity

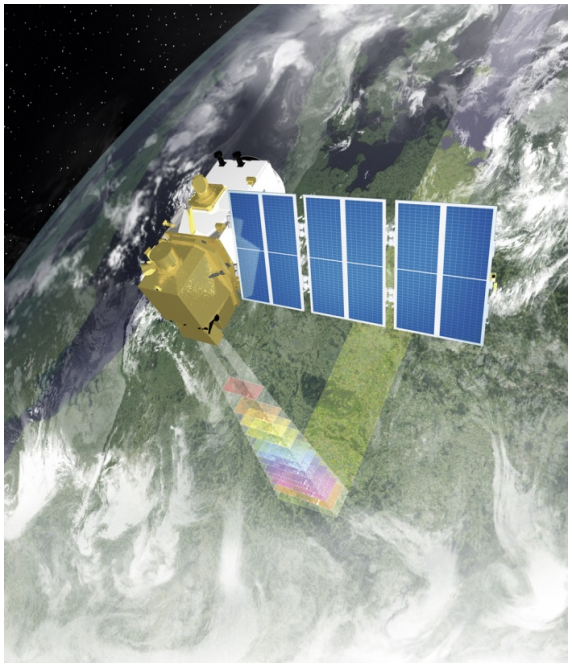


- Ice drift



- Rapid mapping

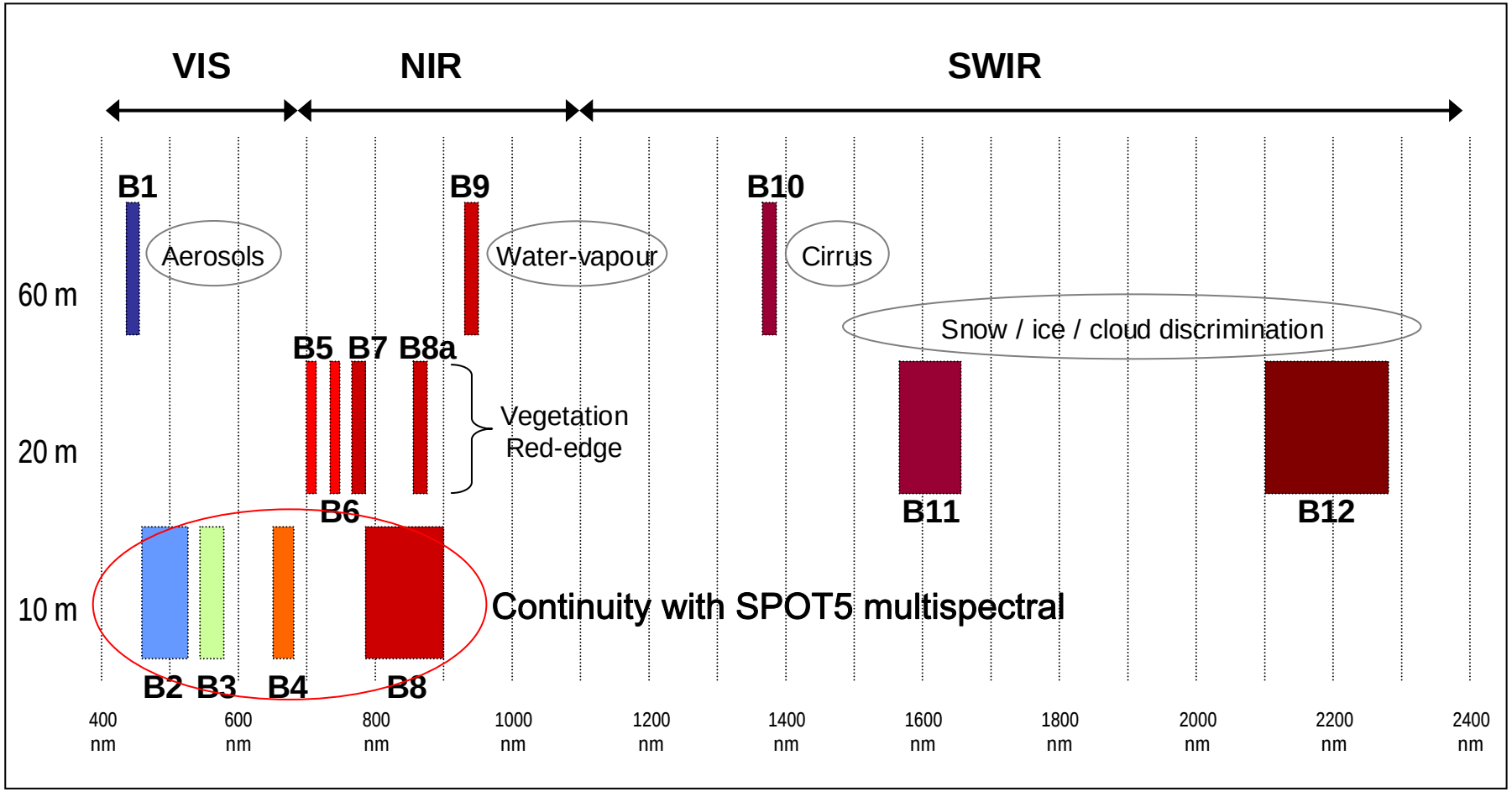
Sentinel–2: Superspectral Imaging Mission



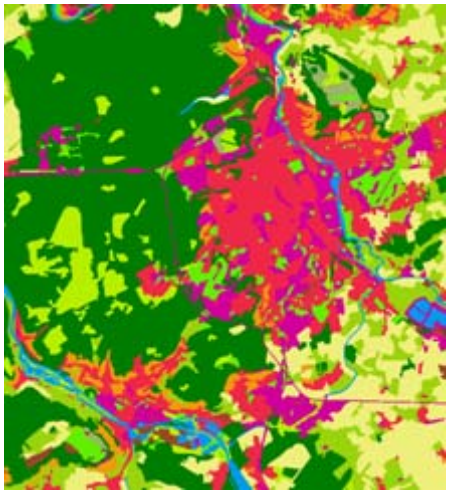
- Applications:
  - generic land cover maps
  - rapid mapping for emergency response

- 13 spectral bands (VIS, NIR & SWIR)
- Spatial resolution: 10, 20 and 60 m
- 290 km swath width
- 10 days repeat cycle (with 2 satellites: 5 days)
- Sun synchronous orbit at 786 km mean altitude
- 1200 kg spacecraft mass
- 7 years design life time, consumables for 12 years

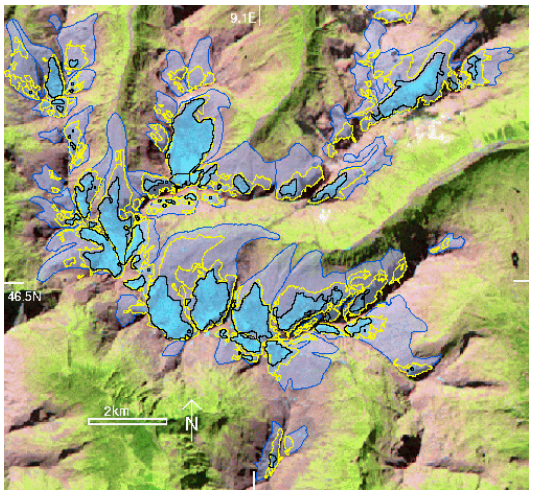
Sentinel–2: 13 Spectral Bands



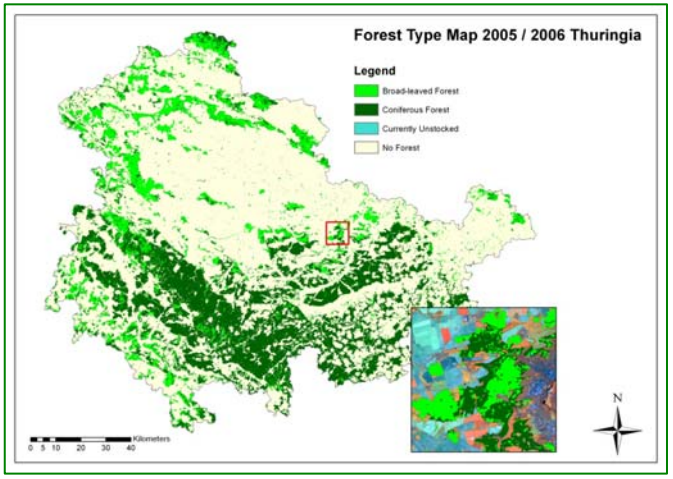
Sentinel–2 Applications



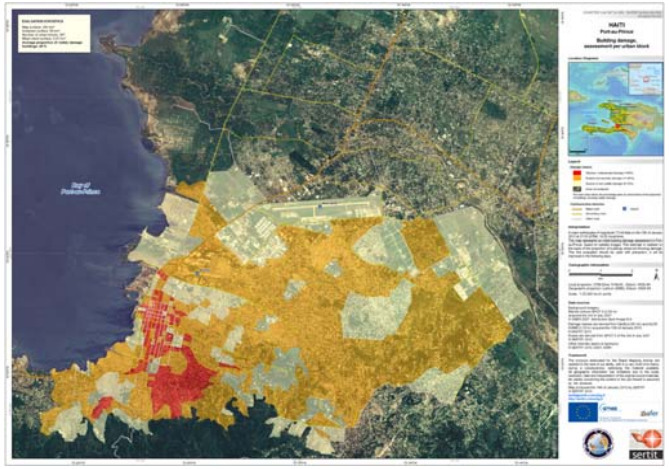
- Land cover



- Glacier changes



- Forest type



- Emergency response

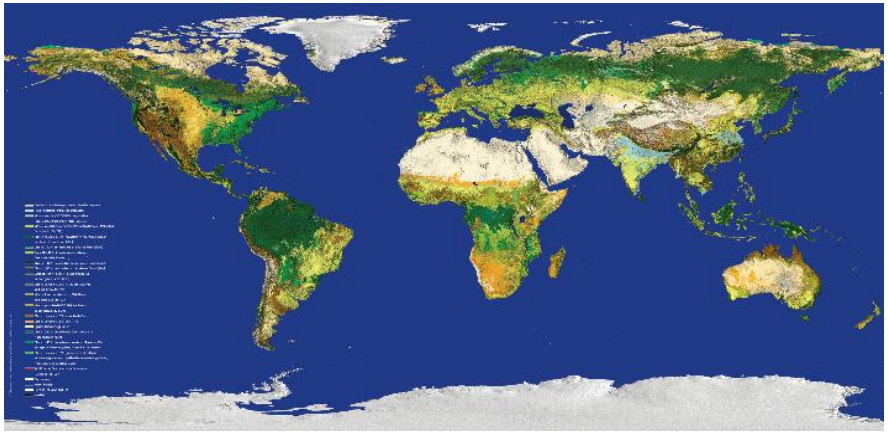
Sentinel–3: Ocean & Land Mission

- 3 core missions for continuity:
  - Sea and land colour data (MERIS)
  - Sea/Land surface temperature (AATSR)
  - Sea surface topography (Envisat RA)

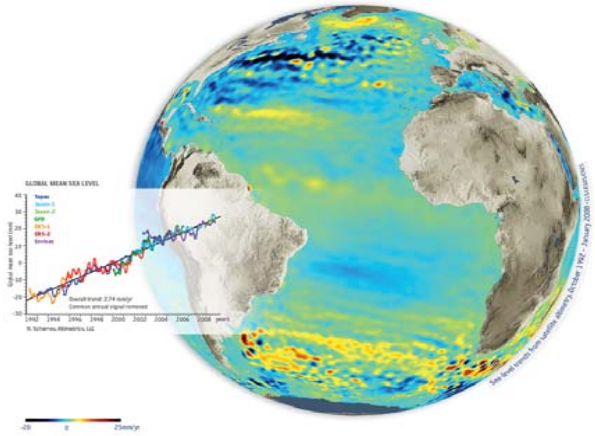
- Payload design also allows:
  - Vegetation data continuity (SPOT4/5)
  - enhanced fire monitoring capabilities
  - Along-track SAR for coastal zones, in-land water and sea-ice topography

- Revisit time: 4 days (OLCI), 2 days (SLSTR), 27 days (SRAL) with 1 unit
- Sun synchronous orbit at 814.5 km mean altitude over geoid
- 1250 kg spacecraft mass
- 7 years design life time, consumables for 12 years

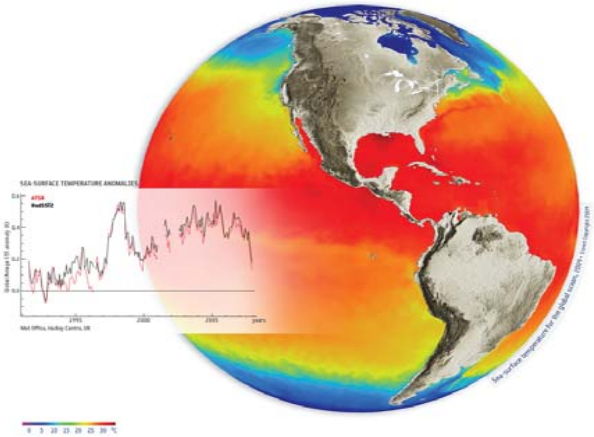
Sentinel–3 Applications



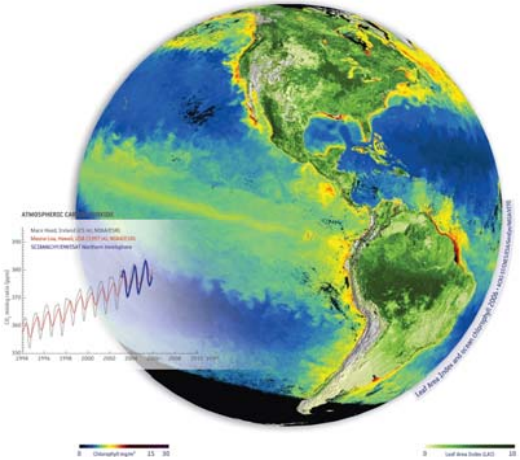
- Global land cover



- Sea level rise



- Sea surface temperature



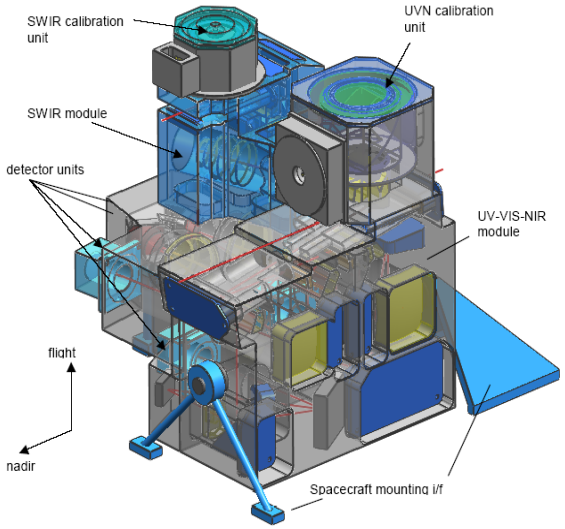
- Carbon Cycle

Sentinel–4: GEO Atmospheric Mission

- Applications:
  - air quality
  - tropospheric composition
- Geostationary UVN allowing:
  - High temporal and spatial resolution
  - High precision monitoring with sensitivity to the Planetary Boundary Layer
  - High vertical resolution measurements in the upper troposphere/lower stratosphere
- Spatial sampling of 8 km and spectral resolution between 0.12 nm (near-IR) and 0.5 nm (UV/visible)
- Embarked on MTG-Sounder Satellite and operated by EUMETSAT

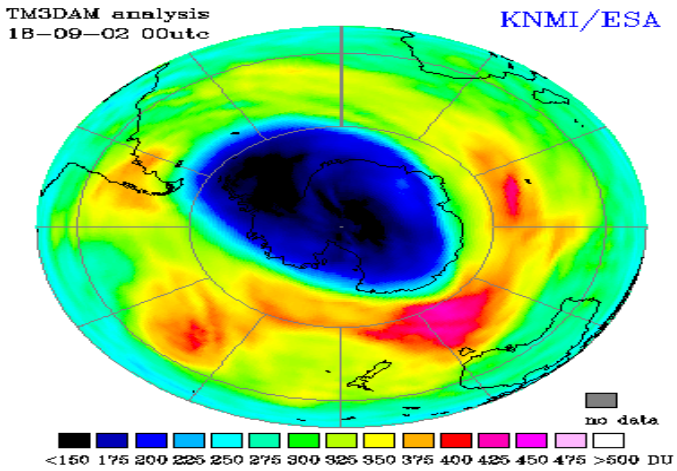
Sentinel–5 and S–5 Precursor: LEO Atmospheric Missions

- **Applications:**
  - **Air quality**
  - **Climate forcing**
  - **Stratospheric ozone**
  - **Target parameters: O_3, NO_2, CO, SO_2, CH_4, H_2O, BrO and aerosols**

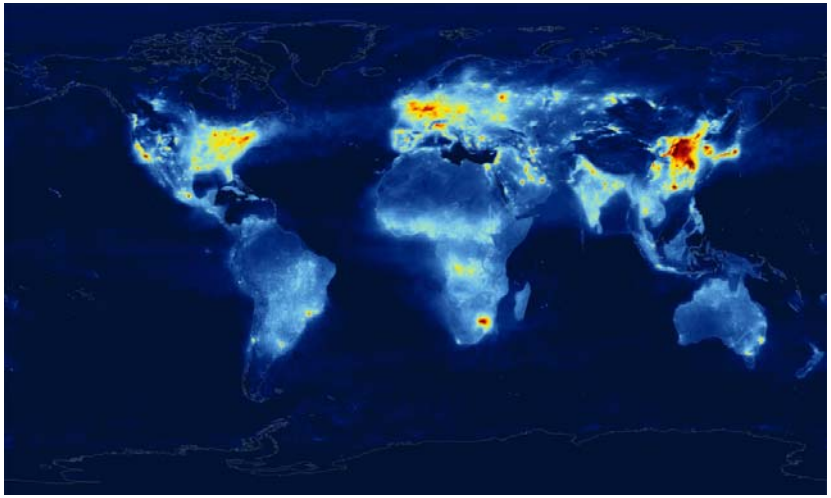


- **UV-VIS (270-500 nm), NIR (675-775 nm), SWIR (2305-2385 nm)**
- **Push-broom grating spectrometer**
- **Global daily coverage with 7x7 km2 ground pixel**
- **Sun-synchronous LEO platform at 824 km mean altitude**
- **Sentinel-5 embarked on post-EPS and operated by EUMETSAT**
- **Sentinel-5 precursor guarantees data delivery for atmospheric services between 2015-2020**

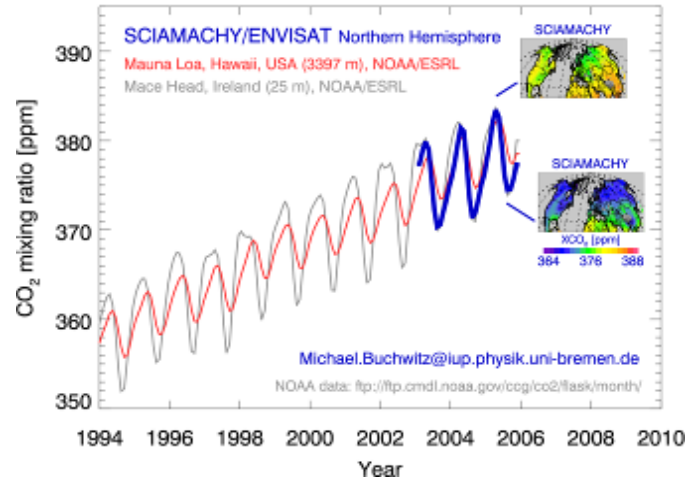
Sentinel–4/5 Applications



- Ozone hole



- Air quality (NO_2)



- Atmospheric Carbon Dioxide

- Cloud properties

GMES Sentinel Data Policy Principles

FREE and OPEN

Anybody can access Sentinel data;
no difference is made between public, commercial and scientific use
→ open access

Sentinel data will be made available to the users via a 'generic' online access mode
→ free of charge