Simon Jutz

European Space Agency

Copernicus ECOSYSTEM WORKSHOP 2018
BRUSSELS, 9+10 OCTOBER

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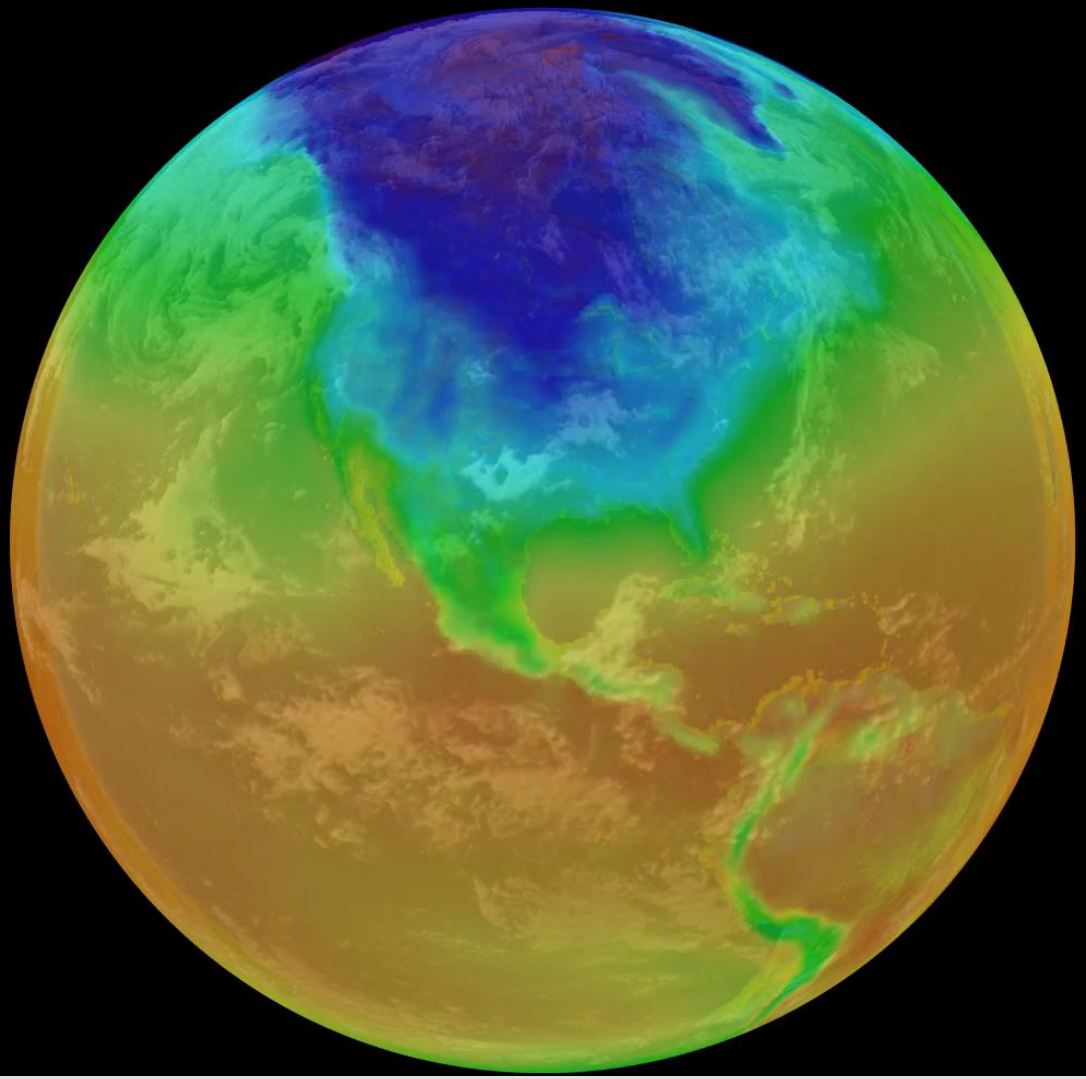
ESA's contribution to the Future of the Copernicus Space Component

Simon Jutz
Head of the Copernicus Space Office
European Space Agency

ESA Monitors the Health of the Planet

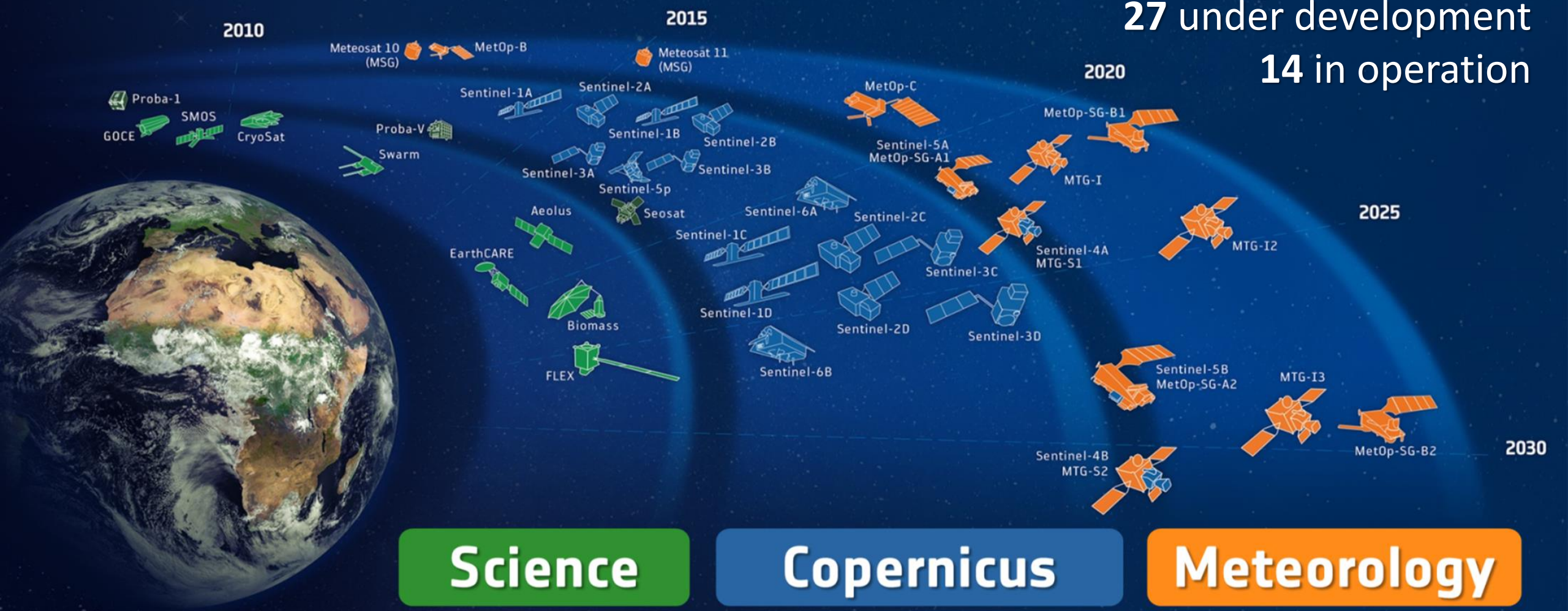


ESA-DEVELOPED EARTH OBSERVATION MISSIONS

Satellites

27 under development

14 in operation



Sentinel Status - indicative Launch Dates

S-1

Radar

A
3 Apr. 2

B
25 Apr. 20

C
2022

D
2024-2027

S-2

D
2025-2028

S-5

S-6

Altimetry

A
020

B
2025

- ✓ **7 successful launches** in a row with Soyus, Vega, Rockot
- ✓ **Instruments** better than specified with excellent results
- ✓ **Unprecedented User Uptake**, >170.000 self-registered data user, and many more Copernicus users
- ✓ **Largest and most comprehensive Earth Observation Programme worldwide**

The Copernicus Revolution

Largest producer of EO data in the world

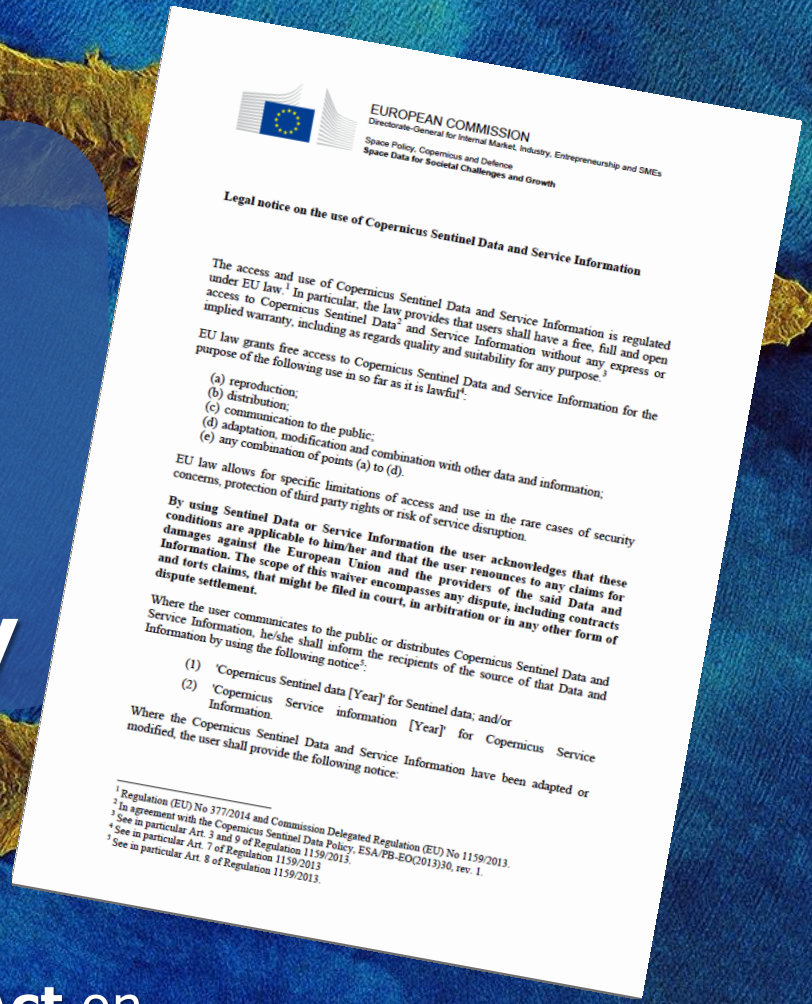
All global landmass is observed every 5 days at 10m resolution

This has never happened before

Copernicus Sentinel Data Policy

Sentinel data are available:

- ✓ **Free, Full and Open***
- ✓ **Over very long term**
- ✓ **Systematically, Operationally**



EUROPEAN COMMISSION
Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs
Space Policy, Copernicus and Defence
Space Data for Societal Challenges and Growth

Legal notice on the use of Copernicus Sentinel Data and Service Information

The access and use of Copernicus Sentinel Data and Service Information is regulated under EU law.[1] In particular, the law provides that users shall have a free, full and open access to Copernicus Sentinel Data[2] and Service Information without any express or implied warranty, including as regards quality and suitability for any purpose.[3]

EU law grants free access to Copernicus Sentinel Data and Service Information for the purpose of the following use in so far as it is lawful[4]:

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(b) distribution;
(c) communication to the public;
(d) adaptation, modification and combination with other data and information;
(e) any combination of points (a) to (d).

EU law allows for specific limitations of access and use in the rare cases of security concerns, protection of third party rights or risk of service disruption.

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Where the user communicates to the public or distributes Copernicus Sentinel Data and Service Information, he/she shall inform the recipients of the source of that Data and Information by using the following notice[5]:

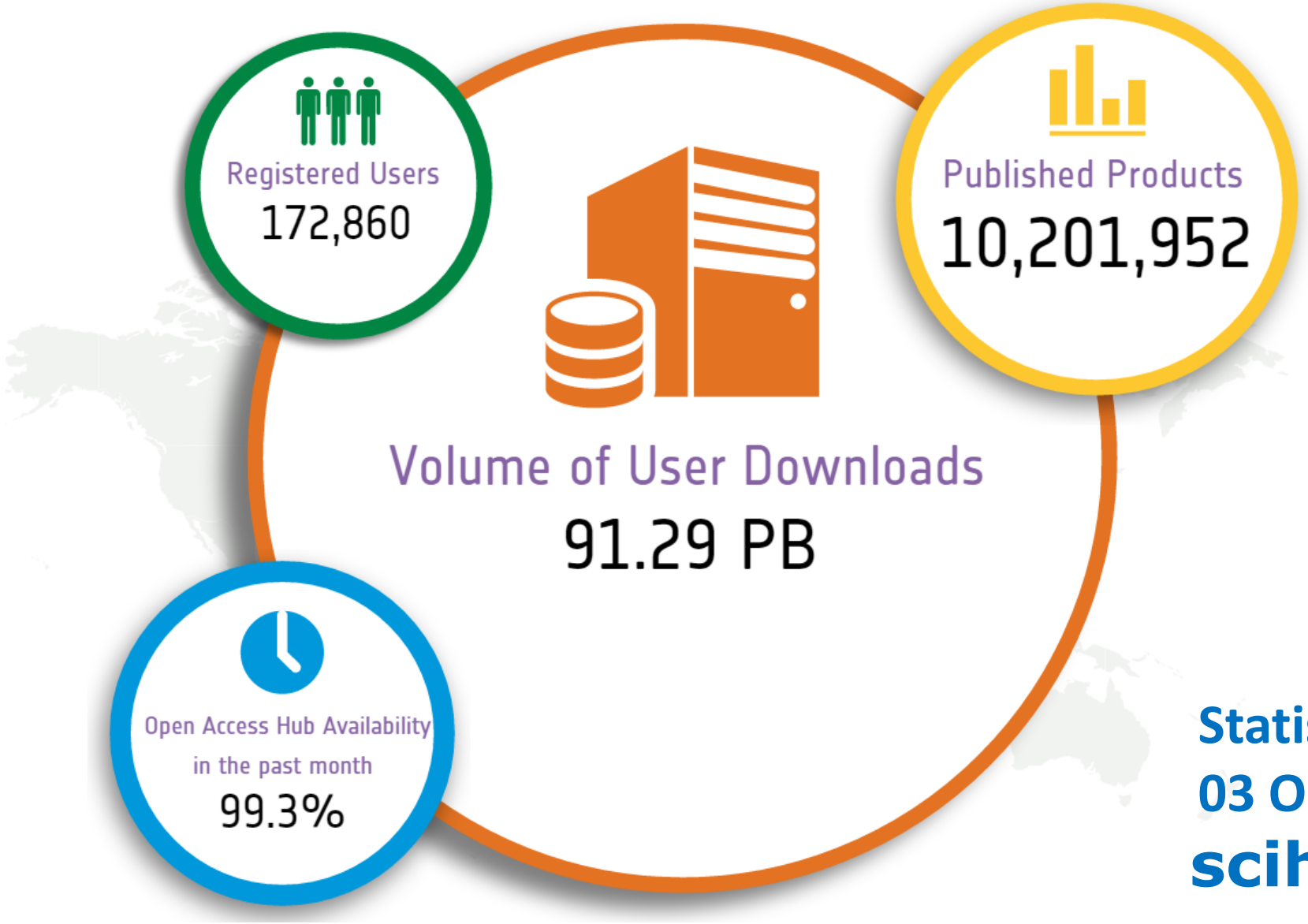
(1) 'Copernicus Sentinel data [Year]' for Sentinel data; and/or
(2) 'Copernicus Service information [Year]' for Copernicus Service Information.

Where the Copernicus Sentinel Data and Service Information have been adapted or modified, the user shall provide the following notice:

[1] Regulation (EU) No 377/2014 and Commission Delegated Regulation (EU) No 1159/2013.
[2] In agreement with the Copernicus Sentinel Data Policy, ESA/PB-EO(2013)30, rev. 1.
[3] See in particular Art. 3 and 9 of Regulation 1159/2013.
[4] See in particular Art. 7 of Regulation 1159/2013
[5] See in particular Art. 8 of Regulation 1159/2013.

* **ESA Sentinel Data Policy** (Sep 2013) and **EU Delegated Act** on Copernicus Data and Information Policy (Dec 2013)

Sentinel Open Access Data Hub



Statistics on
03 Oct. 2018

scihub.copernicus.eu

Copernicus 2.0

2020 to 2027

- Building on the Success of Copernicus

Continue current observations
(Sentinel 1-6)

Satisfy emerging
policy & user needs
(Sentinel 7+)

→ **Copernicus Long Term Scenario**

- Generated in close coordination of EC – ESA – EUMETSAT

→ **Joint Operations Concept of ESA & EUMETSAT**

Copernicus 2.0

Copernicus Long Term Scenario

- 20 new spacecraft
- 6 new mission domains
- Integration of NewSpace and national mission data
- Sophisticated, operational data access

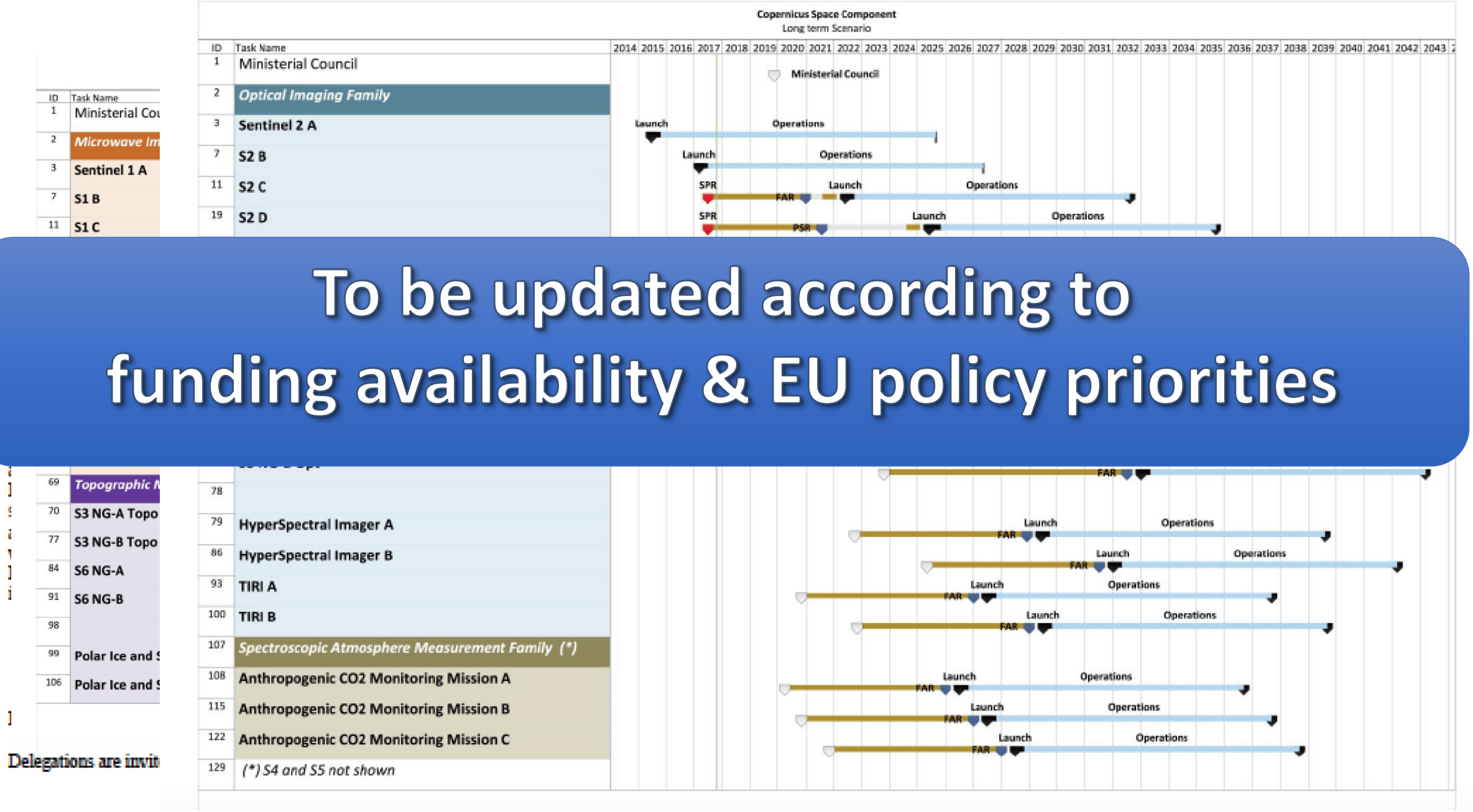
Cost estimates in c.e.c.

- **Estimated (LTS) needs for space from EU: 6,6 bn Euro**
- **EC MFF 2021-2027 Proposal: 5,8 bn space and services**
- **Assuming 1,2bn for services = 4,6 bn for space**

Delta to LTS approx. 2 bn

ESA contribution (2018e.c.): 1,4 bn CM19 +0,6 bn CM22/25

ESA/PB-EO(2018)12



To be updated according to funding availability & EU policy priorities

Delegations are invit

Copernicus Space Component Evolution

2014

Current Sentinels

Sentinel **Expansion**

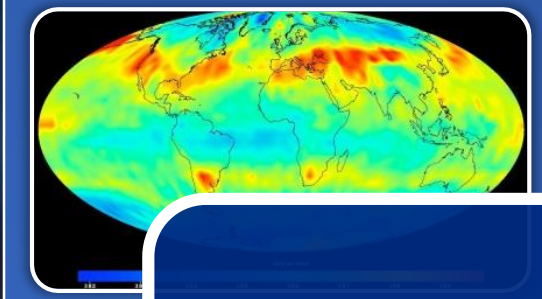
Sentinel **Next Generation**

Next-Gen. missions will replace current & expansion missions

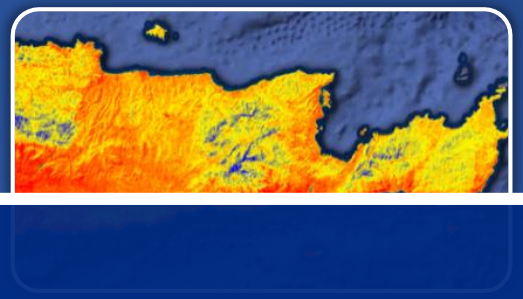
Copernicus **for Security**

Copernicus 2.0

6 High Priority Candidate Missions

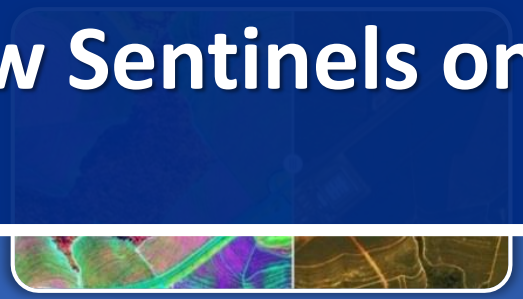


Monitor causes of Anthropogenic CO_2 Climate Change (CO_2 emissions)



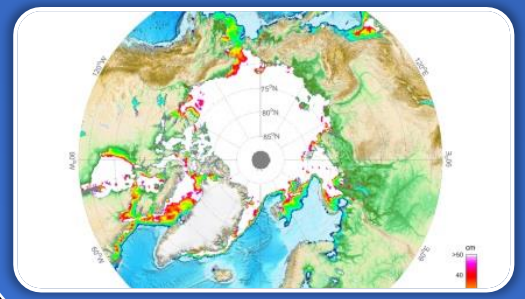
High Resolution Surface Agriculture & Water Temp Productivity

Polar Ice & Snow Climate Change Topography (Arctic/Polar ice volume)

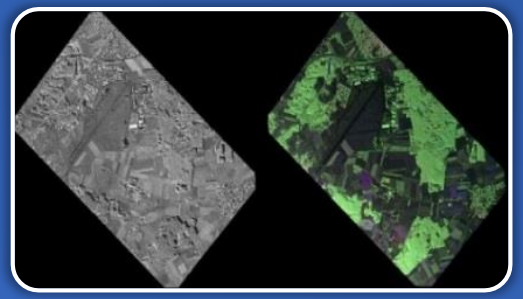


Food Security, Soil & Hyperspectral Imaging Minerals, Forestry, Biodiversity

Phase A/B1 for new Sentinels ongoing

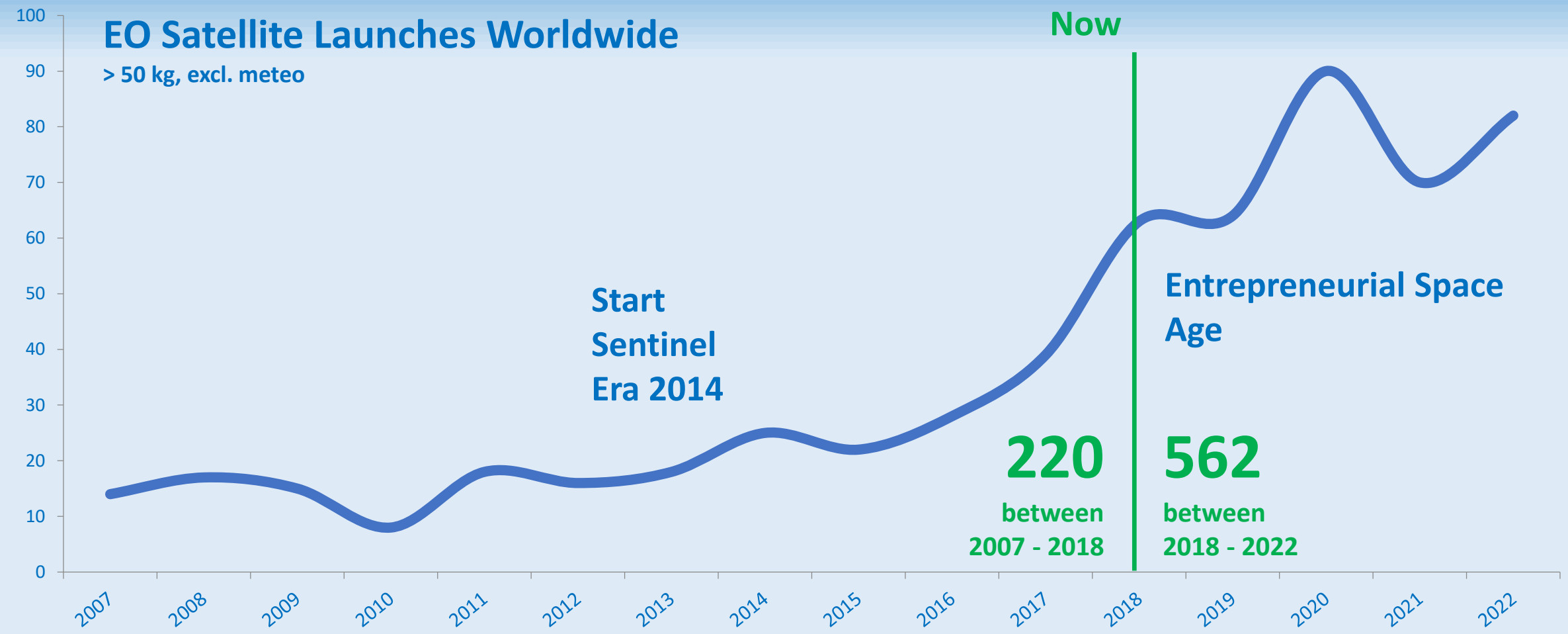


Sea Ice Conc. & SST Passive Microwave Imaging (Arctic situational awareness)



L-band SAR Soil Moisture, Vegetation & Ground Motion

More Eyes in the Sky



Source: Euroconsult Database, 2017

Air Pollution Monitoring
Sentinel-5P

NO_2 Concentrations

Europe

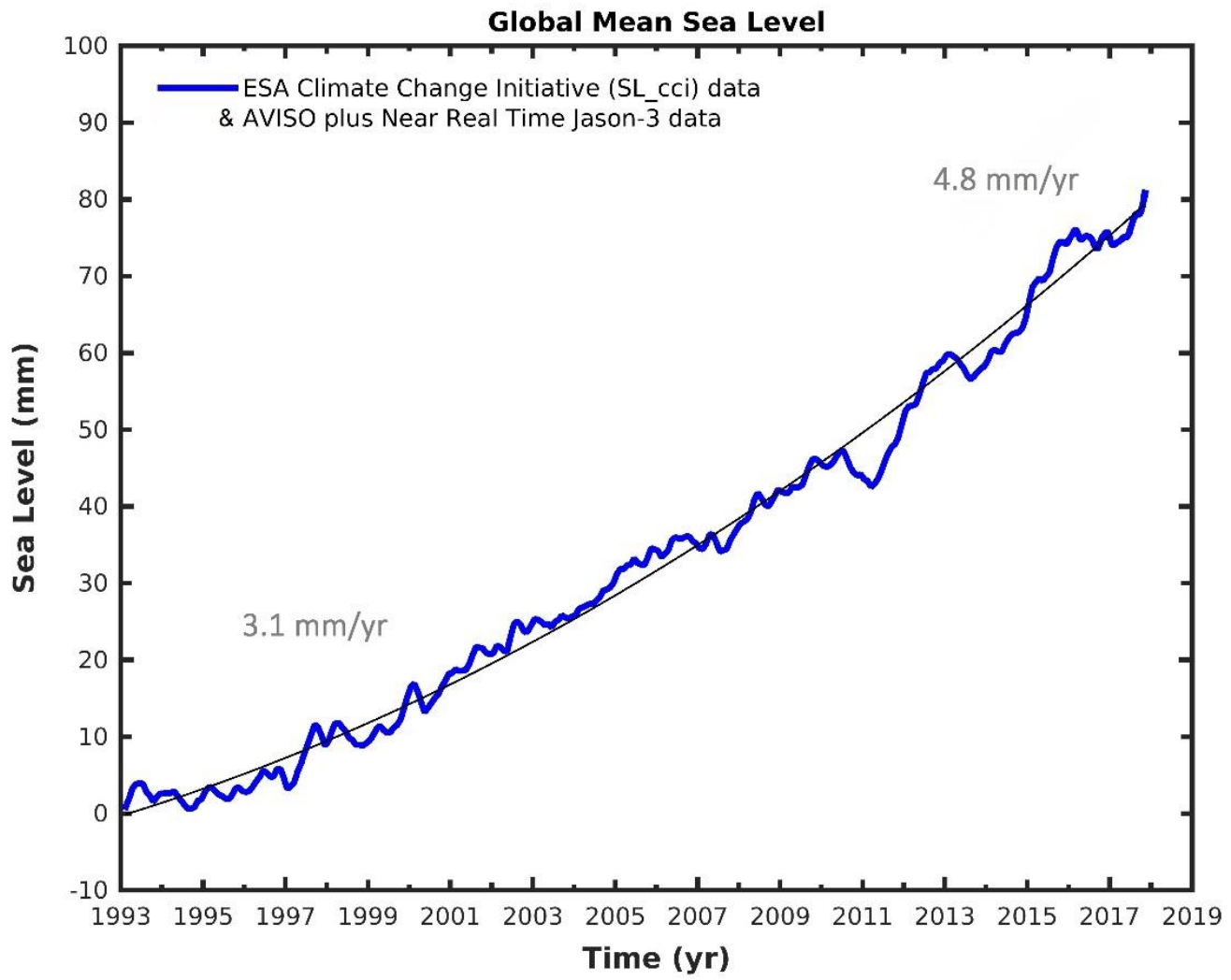
19 April 2018

© KNMI / ESA

Air pollution causes around 467,000 **premature deaths** in Europe every **year**

EEA 2016 Report

Sea Level Rise



Sea level rise is accelerating. Sea levels could rise 1.3 meters in the next 80 years.

Proceedings of the National Academy of Sciences

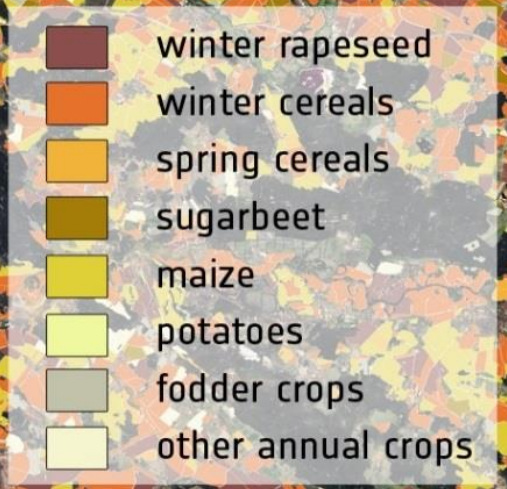
February 2018

Copernicus revolutionises EU Common Agricultural Policy (CAP)

"Copernicus will significantly **reduce** the number of **field inspections** ... thus benefitting public administrations, by **reducing the costs of controls** & checks."

"It is thus a **win-win for farmers and administrators**."

Phil Hogan
European Commissioner for Agriculture and Rural Development
25 May 2018



Thank you for your attention!

www.esa.int

Simon.jutz@esa.int

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