Copernicus & Agenda 2030

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Copernicus - an introduction

- European response to **global needs**
  - **to manage the environment;**
  - **to mitigate the effects of climate change, and**
  - **to ensure civil security.**

- An **integrated** Earth Observation system combining
  - **space-based and in-situ data, with**
  - **earth system models and services.**

Copernicus Components

Coordinators

ESA, EUM, industry, natl. agencies

European Commission

Overall responsibility & coordination of MS contributions

- Space Component
- Services Component
- In-Situ Component

European Commission

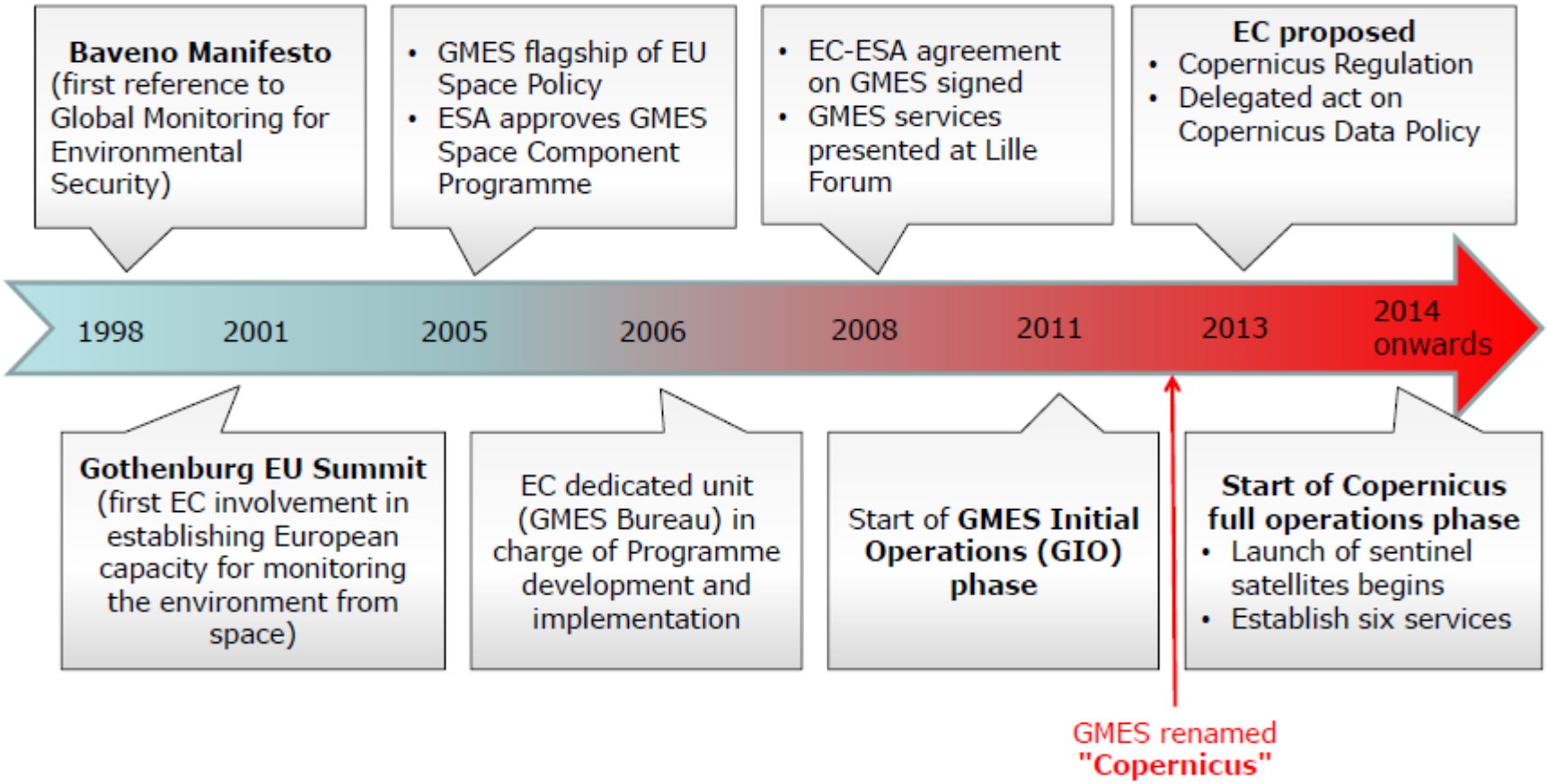
Selection of operators as ECMWF, Mercator, JRC, EEA, FRONTEX, EMSA, EUSC

EEA

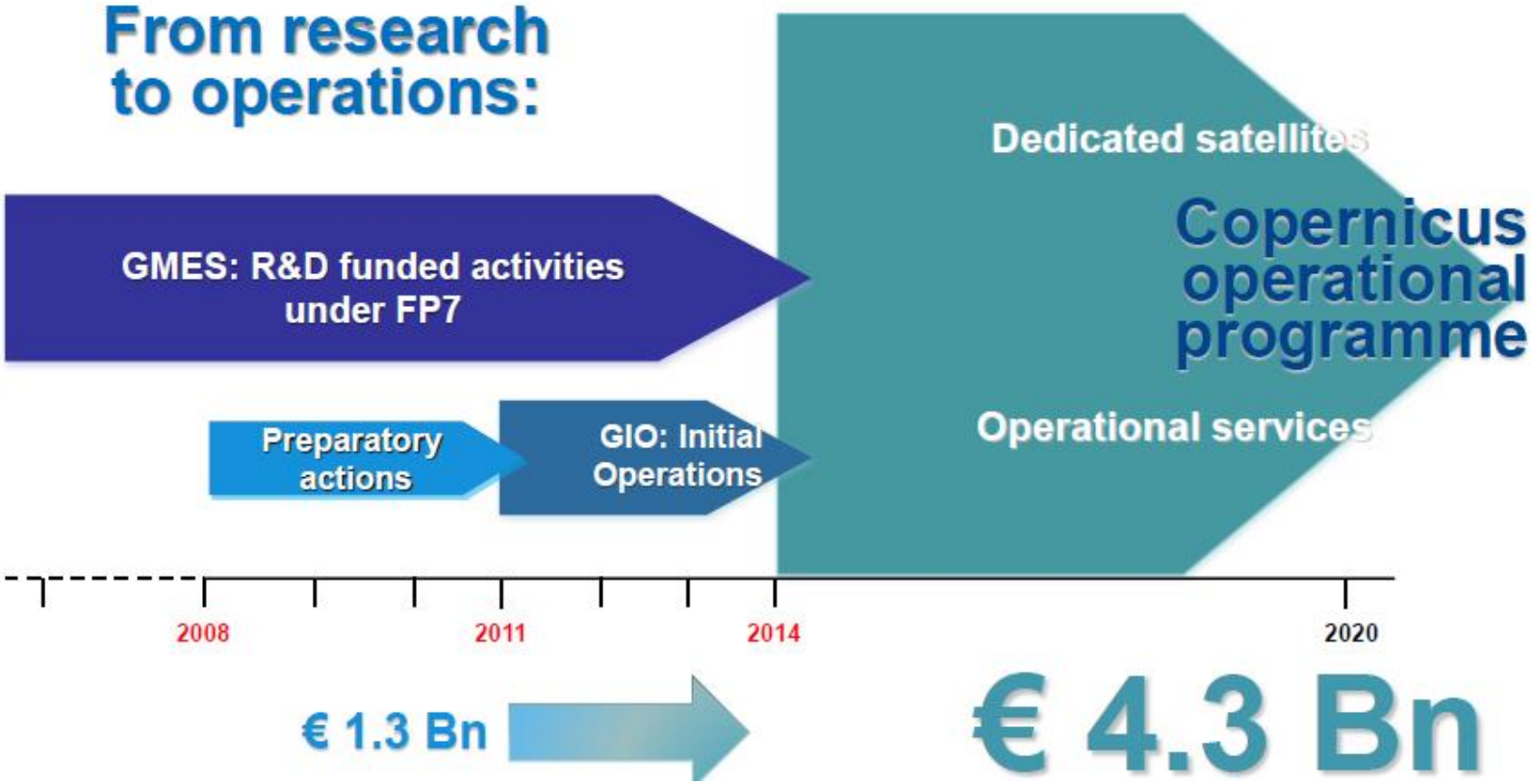
National entities

European Commission

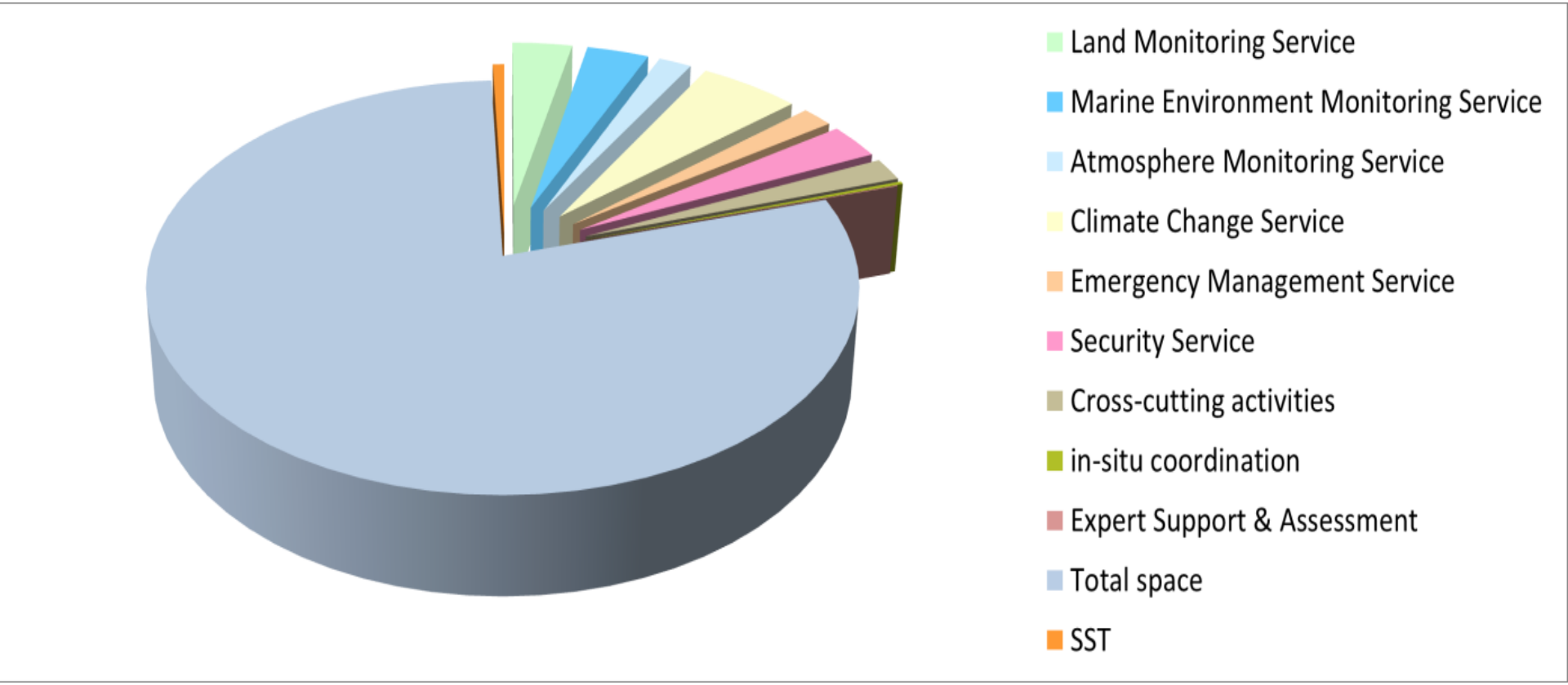
Copernicus History



Copernicus from Research to Operations



Budget 2014 - 2020 (4,3 B€ incl. escalation)

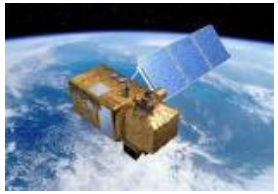


Copernicus Space Infrastructure

Sentinels

Five EO missions developed specifically for Copernicus

Sentinel 1



Sentinel-2

Sentinel-3

Sentinel-4

Sentinel-5 & 5P

PLUS

Contributing Missions

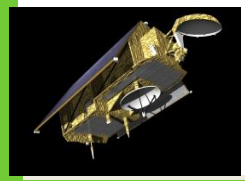
Third party EO missions offering their data to Copernicus (EU/ESA MSs, EUMETSAT, commercial, international)

AND

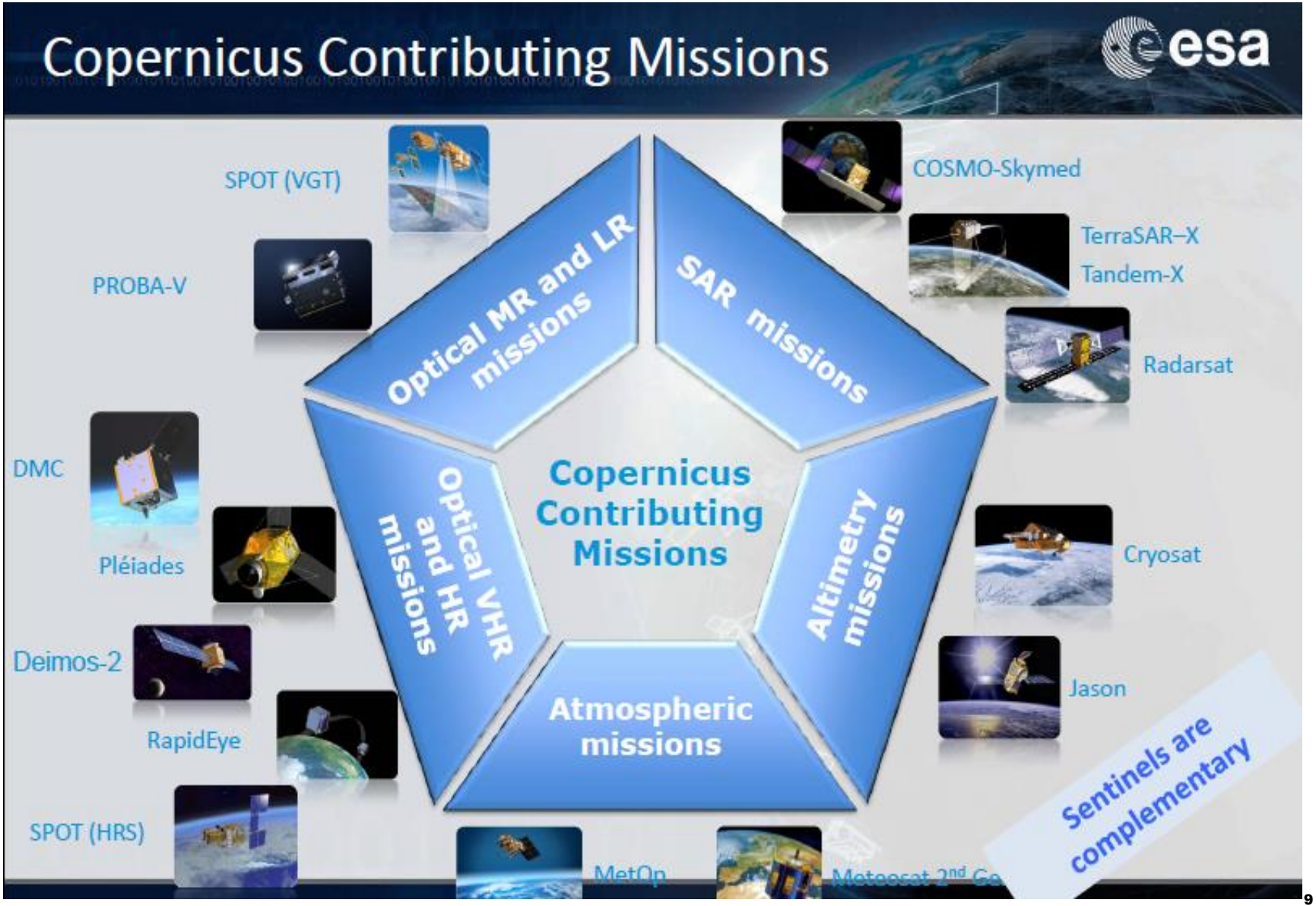
High Precision Ocean Altimetry (HPOA) mission

Sentinel-6 = Jason-CS

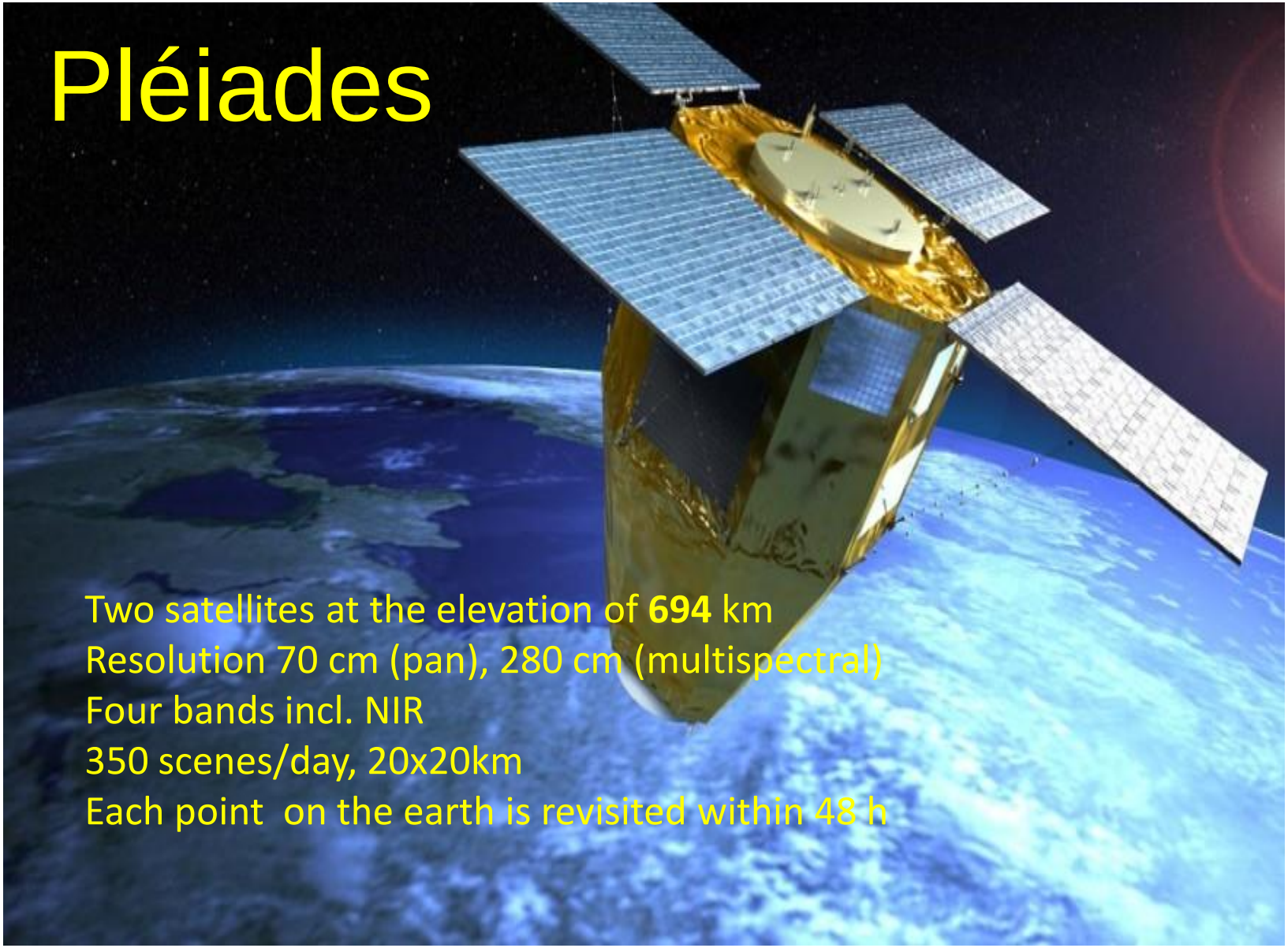
Copernicus Dedicated Missions & Launch Schedule

	**Sentinel-1 (A/B) – SAR imaging** All weather, day/night applications, C-band SAR, interferometry	1-A 1-B	3 April 2014 22 April 2016
	**Sentinel-2 (A/B) – Multi-spectral imaging** Land applications: urban, forest, agriculture,… Continuity of Landsat, SPOT	2-A 2-B	23 June 2015 7 March 2017
	**Sentinel-3 (A/B) – Ocean and global land monitoring** Wide-swath ocean color, vegetation, sea/land surface temperature, altimetry	3-A 3-B	6 Feb 2016 25 April 2018
	**Sentinel-4 (A/B) – Geostationary atmospheric** Atmospheric composition monitoring, trans-boundary pollution	4-A	In 2023
	**Sentinel-5 precursor/ Sentinel-5 (A/B) – Low-orbit atmospheric** Atmospheric composition monitoring, air quality	5-P 5-A	13 Oct 2017 In 2022
	**Sentinel-6 (A/B) – Low inclination Altimetry** Sea-level, wave height and marine wind speed	In 2020	

Copernicus Contributing Missions



Pléiades



Two satellites at the elevation of **694** km
Resolution 70 cm (pan), 280 cm (multispectral)
Four bands incl. NIR
350 scenes/day, 20x20km
Each point on the earth is revisited within 48 h

Copernicus Data Policy

- The Copernicus data policy was adopted via a Delegated Regulation (into force Dec 2013);

- The Data policy is compliant with:
  - ✓ The EU INSPIRE Directive 2007/2/EC;
  - ✓ The EU Public Sector Information – PSI Directive 2003/98/EC;
  - ✓ The definition of GEOSS Data-CORE;

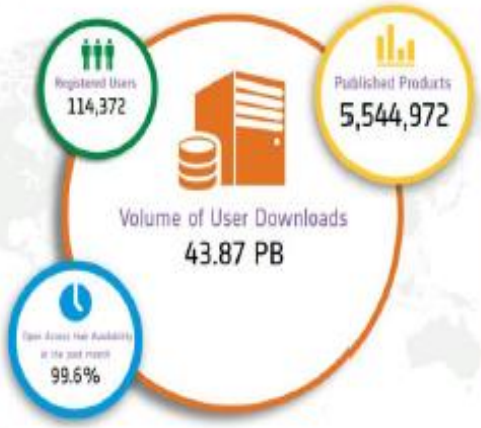
- This policy promotes the access, use and sharing of Copernicus information and data on a full, free and open basis;

- One of the main objectives is to support downstream segment and research, technology and innovation communities;

- The European research institutes will be able to make the best use of these data to create innovative applications and services.

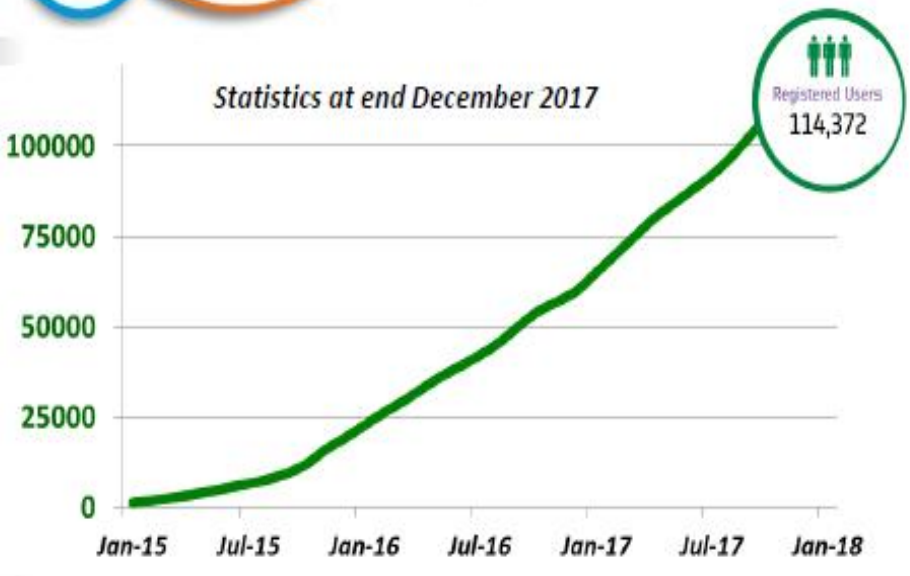
Sentinels Data Access at ESA - Statistics

Data Access



Some evidences of the success of Copernicus:

1. *A continuous increase of users registered on Open Access Hub (+ 100% in 1 year)*
2. *A weekly average of 0.7 PB of data downloaded by users*



Total volume of data downloads during *last 3 months* → *8.3 PBytes*

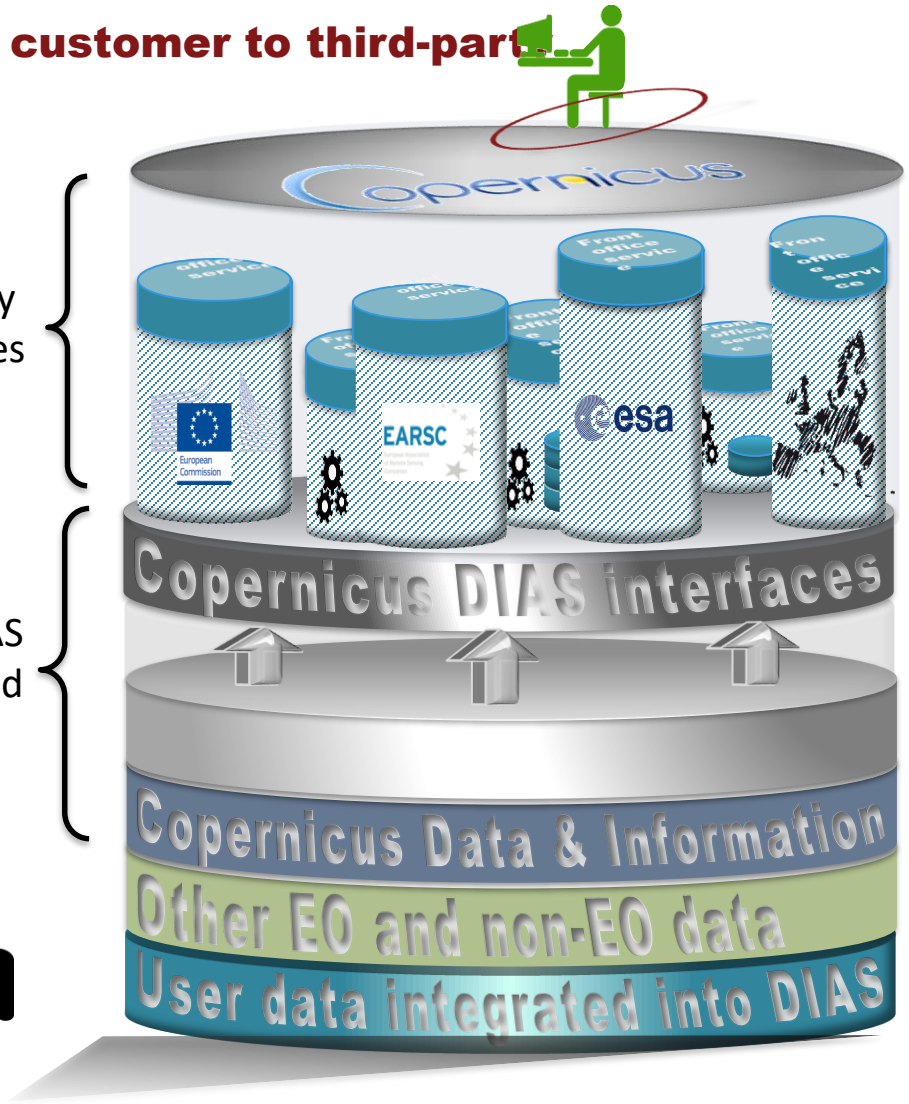
Copernicus
European Commission

EUROPEAN EO DATA ECOSYSTEM ON DIAS

End user: customer to third-part... services

Funded by third-parties

DIAS funded



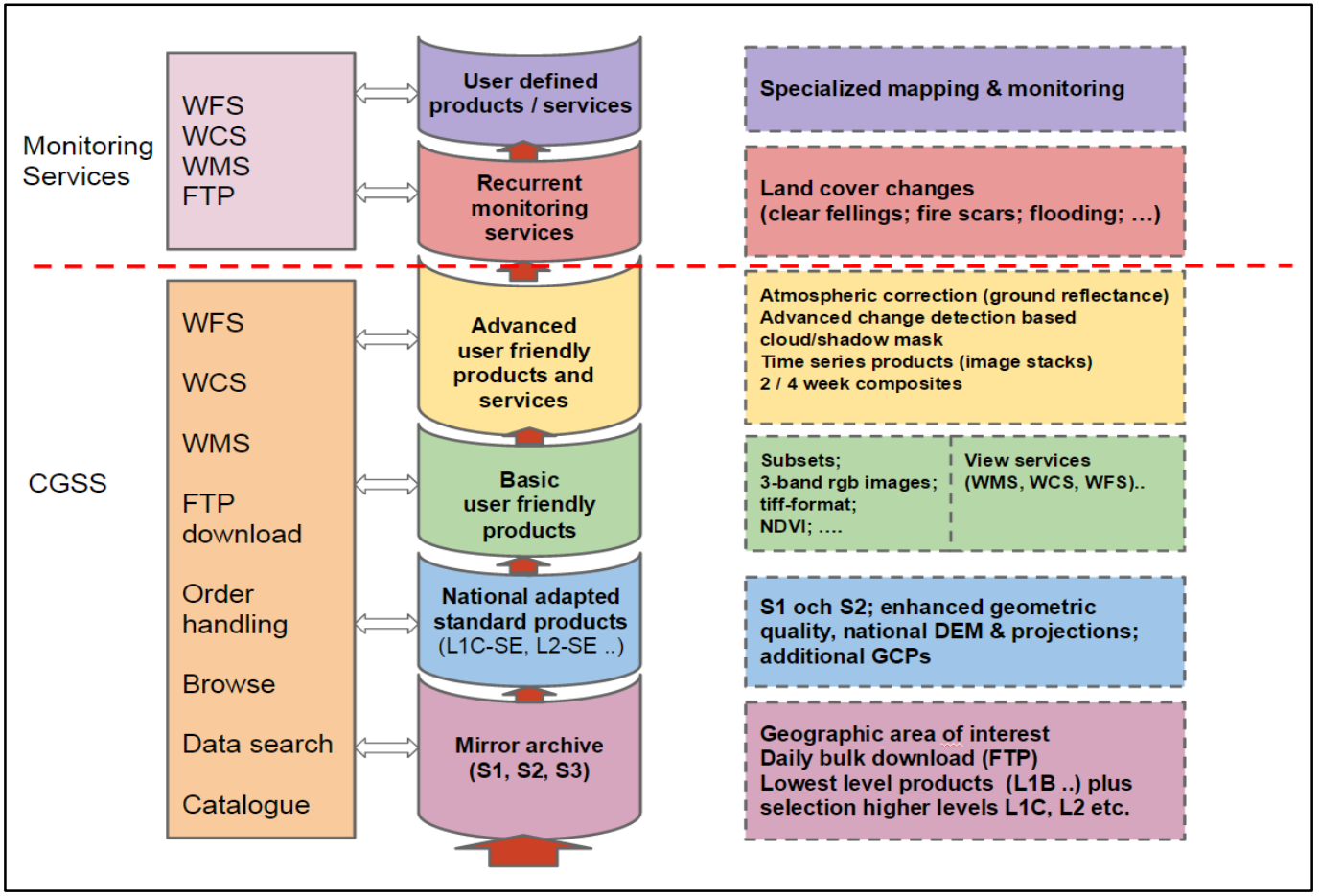
- Copernicus Services & user uptake
- Copernicus Data & Information Access Services
- Open Science Cloud & GEOSS Common Research and Innovation Projects (H2020)
- Infrastructure (GCI)

- Heritage Data (LTDP+), Earthnet
- EOEP-5 EO Science for Society
- EarthWatch CCI, InCubed

- EU MS & participating countries
- National/commercial missions data access
- Sentinel Collaborative Ground Segment

EUMETSAT & Third-party Users

Swea (See also the presentation of Swea, Session 7C by Björn Lovén, SNSB)



Six Copernicus services

Services monitoring Earth systems

Land Monitoring

Marine Monitoring

Atmosphere Monitoring

Horizontal services

Emergency Management

Security

Climate Change

⇒ Output: Value-Added Information

Overview- Copernicus Services&Components

Land Monitoring Service (pan-EU & local) (CMLS)

Land Monitoring Service (global)

Marine Environment Monitoring Service (CMEMS)

Atmosphere Monitoring Service (CAMS)

Climate Change Service (C3S)

Emergency Management Service (CEMS)

Security Service (Border surveillance)

Security Service (Maritime Surveillance)

Security Service (Support to External Action)

In-situ Coordination

Copernicus in Sweden

- In Sweden, Copernicus is handled by the Ministry of Education and Research

	Full Members	Alternative Members
Committee	Göran Boberg, SNSB	Björn Lovén, SNSB
User Forum	Stefan Nilsson, SMHI	Thomas Klein, HaV
Security Board	Göran Boberg, SNSB	Björn Lovén, SNSB

”The Swedish Copernicus User Forum”

Myndighetssamverkan Copernicus:

FÖRSVARSMAKTEN

Havs och Vatten myndigheten

Jordbruks verket

LANTMÄTERIET

MSB Myndigheten för samhällsskydd och beredskap

NATURVÅRDSVERKET

POLARFORSKNINGS SEKRETARIATET
SWEDISH POLAR RESEARCH SECRETARIAT

RYMDSTYRELSEN
Swedish National Space Board

SCB Statistiska centralbyrån
Statistics Sweden

SGI Statens geotekniska institut

SGU Sveriges geologiska undersökning

SJÖFARTSVERKET

SKOGSSTYRELSEN

SLU

SMHI

- Besides we have a similar network for climate change adaptation, consisting of 18 national authorities and the 21 regional administrative boards.

➢ Open data from Copernicus – Possibilities for climate adaptation (https://www.havochvatten.se/download/18.5114cf181604c603d4831fc7/1513332236820/rapport-copernicusdata-klimatanpassning.pdf)

Responsibility & coordination of the different thematic services in Copernicus

- Land – Divided responsibility between Swedish EPA and the Swedish Land Survey (LM); Participation: Swedish Board of Agriculture, Statistics Sweden, Swedish Forest Agency, SLU, SGI, SGU;
- Marine – Swedish Agency for Marine and Water Management (HaV), SMHI, Swedish Maritime Administration;
- Atmosphere – SMHI, SEPA;
- Climate Change – SMHI, SEPA, HaV;
- EMS – Swedish Civil Contingencies Agency, LM, SMHI;
- Security – Swedish Armed Forces, LM, Swedish Maritime Administration.


GEO
GROUP ON
EARTH OBSERVATIONS

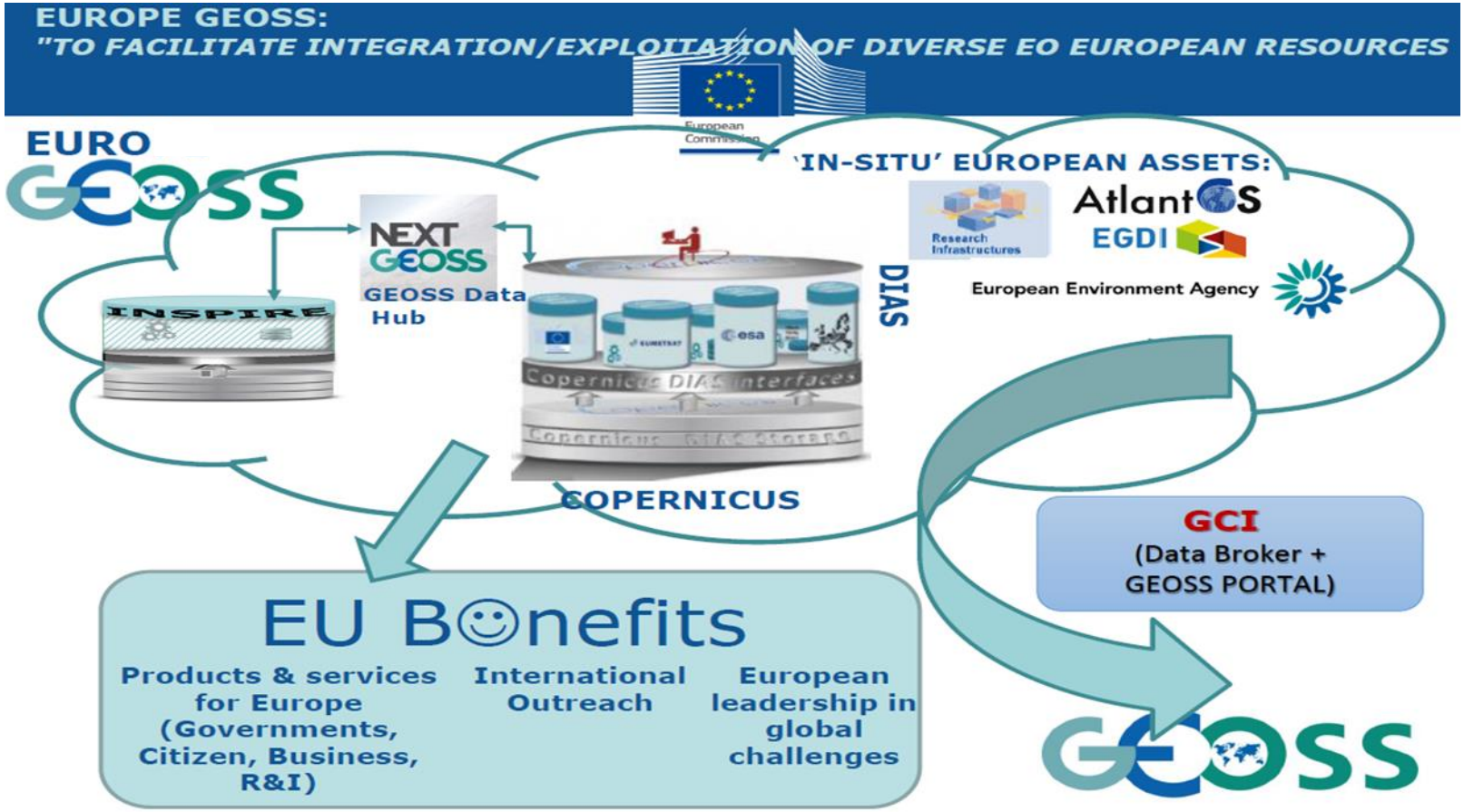
GEO – Group on Earth Observations

- **GEO is a unique partnership** of more than 100 National Governments and over 115 Participating Organisations, aimed at ensuring that EO-information about our planet that is necessary to address global challenges is available to all (SMHI represent Sweden in GEO).

- **Full and open access to Earth observation data**, information and knowledge is crucial as we face unprecedented social, economic and environmental challenges (Mexico City Ministerial Declaration, November 2015).
- Fundamental to the progress of open science is the continued investment by governments and others, in suitable infrastructures and services for data collection, analysis, preservation and dissemination, such as **GEO's' Global Earth Observation System of Systems (GEOSS).**

- **Copernicus can be seen as the European contribution to GEO**.
- **In Europe we are now building up EuroGEOSS (which will be Europe's part of GEOSS)**

EuroGEOSS



- **Stimulate user uptake; focus on applications linked to identified SDGs.**

Agenda 2030 & SDGs

- The 2030 Agenda for Sustainable Development provides a universal development agenda for all countries and stakeholders to use as a blueprint of action for people, the planet and prosperity. The agenda is anchored by seventeen Sustainable Development Goals (SDGs), associated Targets, and a Global Indicator Framework. Collectively, these elements enable countries and the global community to measure, manage, and monitor progress on economic, social and environmental sustainability.

EO and Geospatial information: supporting official statistics in monitoring and achieving the 2030 Agenda – EO4SDGs (GEO Intitative)

- **Goal I:** Demonstrate how earth observations, geospatial information, and socio-economic and other data contribute in novel and practical ways to support achievement of the SDGs;
- **Goal II:** Increase skills and capabilities in uses of Earth observations for SDG activities and their broader benefits;
- **Goal III:** Broaden interest and awareness of Earth observations' support to the SDGs and social, environmental, and economic benefits.

- Effective reporting of progress towards the Indicators requires the use of multiple types of data:
  - Traditional accounts, household surveys and routine administrative data;
  - As well as new sources of data, namely **earth observations, geospatial information, citizen science and Big Data.**

Geospatial Information and Earth Observations: Supporting Official Statistics in Monitoring the SDGs

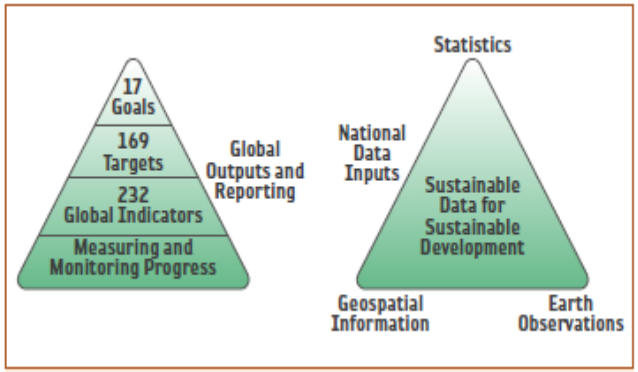
SDG Targets and Indicators that can be supported by Earth Observations

Target Contribute to progress on the Target, not necessarily the Indicator									Goal	Indicator Direct measure or indirect support to the Indicator					
							1.4	1.5	1 No poverty	1.4.2					
						2.3	2.4	2.c	2 Zero hunger	2.4.1					
					3.3	3.4	3.9	3.d	3 Good health and well-being	3.9.1					
									4 Quality education						
								5.a	5 Gender equality	5.a.1					
		6.1	6.3	6.4	6.5	6.6	6.a	6.b	6 Clean water and sanitation	6.3.1	6.3.2	6.4.2	6.5.1	6.6.1	
					7.2	7.3	7.a	7.b	7 Affordable and clean energy	7.1.1					
								8.4	8 Decent work and economic growth						
					9.1	9.4	9.5	9.a	9 Industry, innovation and infrastructure	9.1.1	9.4.1				
						10.6	10.7	10.a	10 Reduced inequalities						
	11.1	11.3	11.4	11.5	11.6	11.7	11.b	11.c	11 Sustainable cities and communities	11.1.1	11.2.1	11.3.1	11.6.2	11.7.1	
				12.2	12.4	12.8	12.a	12.b	12 Responsible consumption and production	12.a.1					
					13.1	13.2	13.3	13.b	13 Climate action	13.1.1					
		14.1	14.2	14.3	14.4	14.6	14.7	14.a	14 Life below water	14.3.1	14.4.1	14.5.1			
	15.1	15.2	15.3	15.4	15.5	15.7	15.8	15.9	15 Life on land	15.1.1	15.2.1	15.3.1	15.4.1	15.4.2	
								16.8	16 Peace, justice and strong institutions						
17.2	17.3	17.6	17.7	17.8	17.9	17.16	17.17	17.18	17 Partnerships for the goals	17.6.1	17.18.1				

Focus on three SDG's

- In collaboration with UN-GGIM (Global Geospatial Information Management), GEO has identified three SDG's where Earth Observations play an important role

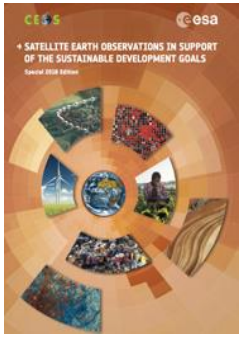
  - Goal 2: Zero hunger
  - Goal 6: Clean water and sanitation
  - Goal 15: Life on land



  - See also the EO4SDGs and CEOS & ESA reports (with some good examples on the use of EO for SDGs):

http://bit.ly/2k9YJtt

http://www.eohandbook.com/



Agenda 2030 - the Swedish Baseline

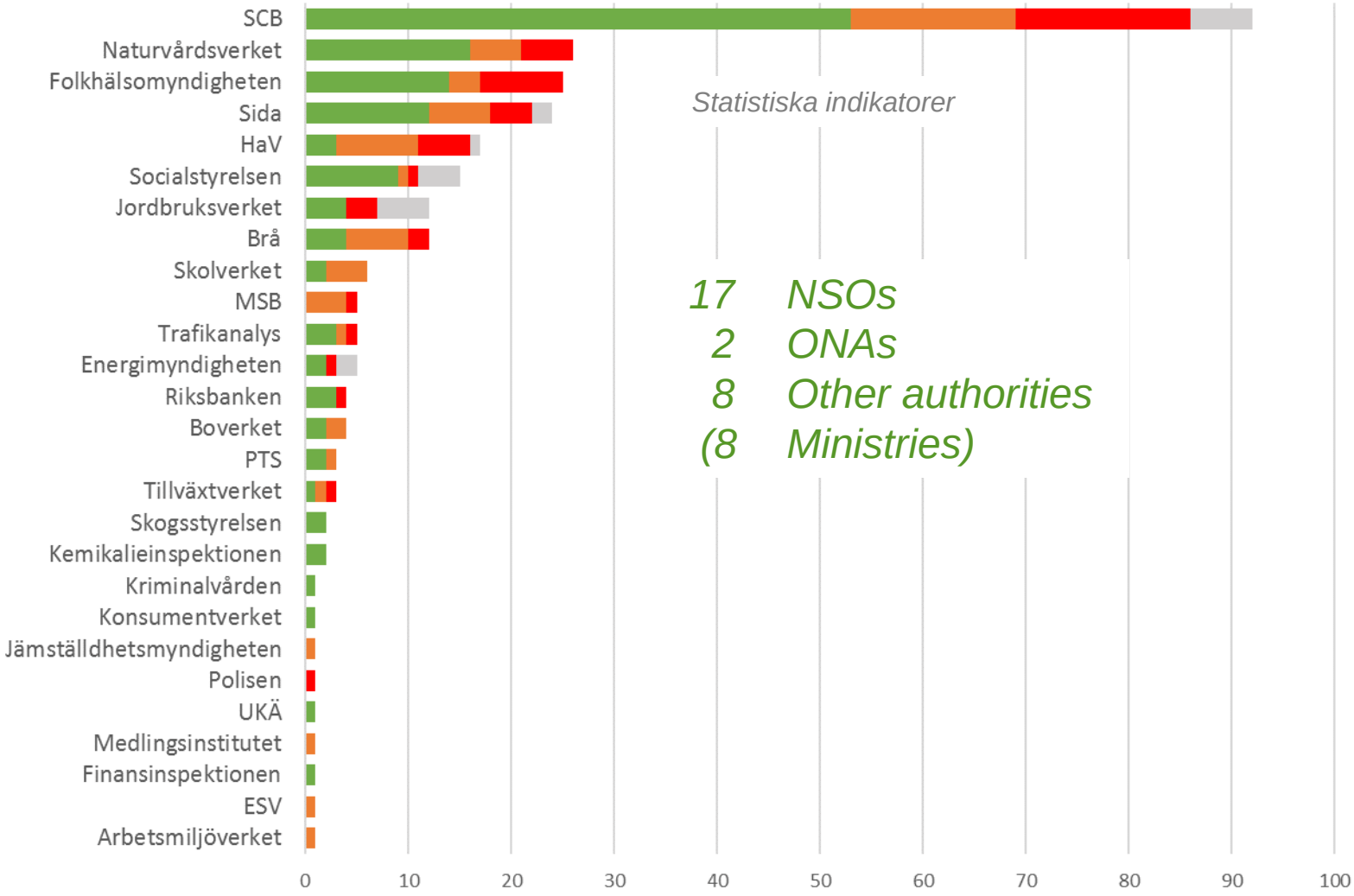
- **Statistics Sweden (SCB)**
  - SCB got the task from the Government to develop the baseline for the first voluntary national reporting 2017 at the High Level Political Forum in New York July 2017;
  - The Baseline Report covered the global indicators;
  - In a Final Report from October 2017 Statistics Sweden makes a more detailed proposal on the national reporting.

- **Swedish Agenda 2030 Delegation**
  - Report 1 March 2018; including status analysis and action plan.

  →→→

- **The Government action plan will build on this report and SCBs final report, and the intention is to present an action plan before summer 2018.**

More than 30 Swedish Agencies is responsible for the indicators



Still a long way to go…

- Regarding sustainable development in the European Union - **Monitoring Report on Progress towards the SDGs in an EU Context – 2017 Edition from Eurostat:**
  - The only official contribution today from **Copernicus and the Marine Service** is for **monitoring pH**, both at global scales and for European seas;
  - But Eurostat is at least working with other services of the European Commission to consider the use of new data sources such as the integration of Earth observation data and information from Copernicus, whenever **they contribute to the increased availability, quality, timeliness and disaggregation of data.**

…but there is also hope

- Building on the Statistics Sweden (SCB) report “Om statistikbaserad uppföljning av Agenda 2030” from October 2017, **hopefully we can** throughout the coming monitoring phase, **enhance the use of Earth Observations in the Swedish reporting**.


European Commission
Thank you for your attention!
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opernicus
Europe's eyes on Earth
Web: www.copernicus.eu