



# ESA Earth Observation: Current status and latest results, CM-22 proposals, and activities linked to ESSC

Meeting of the European Space Sciences Committee  
5 May 2022

**Maurice Borgeaud**

Head of the Earth Observation Department  
"Science, Applications and Climate"

ESA UNCLASSIFIED – For ESA Official Use



→ THE EUROPEAN SPACE AGENCY

# Outline



- Latest News from ESA-EOP
- Examples of recent EOP activities
- EOP Programmes at CM-22
- Answers to ESSC Comments
- Potential role of ESSC for the selection of the ESA-EGU EO Award
- Support of the ESSC for the update of the ESA EO Science Strategy



# ESA's Earth Observation Mission



**Satellites**  
 12 in heritage  
 15 in operation  
 41 in development  
 22 in preparation  
 (90 in total)



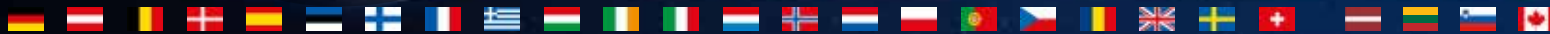
**Develop world-class Earth Observation systems with European and global partners to address scientific & societal challenges**

Science

Copernicus

Meteorology

\*Pending final mission selection



→ THE EUROPEAN SPACE AGENCY



# Latest News in ESA/EOP



→ THE EUROPEAN SPACE AGENCY

# Earth Observation: highlights



**January**  
PNR Italian EO project Kick-off and Implementation plan approved .



**16-17 February**  
Toulouse



**13 January** Space for Green Future User Workshop



**20 January** Successful presentation CO2M Mission to White House Advisory Group



**2nd February**  
Aeolus VOI Workshop



# Earth Observation: highlights



**16th Feb. Space Summit**



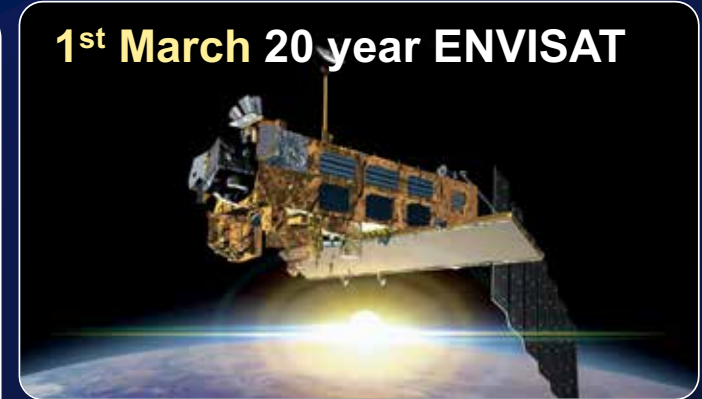
European leaders confirm ambitious plans to work closely together to accelerate Europe as a world leader in space

**1st March**



New international WCRP project office opened at ECSAT facility.

**1st March 20 year ENVISAT**



**24-25 Feb. Φ-Lab Investing in Industrial Innovation Event**



**1st March**

JPPG NASA/ESA meeting



**9-10 March – Virtual EO Info Day**

Info day on opportunities to FutureEO Block 4, GDA, and CCI+, including B2B meetings ESA-industry.

**29-31 March - CEOS SIT-37**

Virtual meeting with ESA as Chair for next two years



# Earth Observation: highlights



**14<sup>th</sup> March**



**ESA 2021 Team Achievement Award to Phisat-1**



**22-23 March**  
**FutureEO**  
**Programmatic**  
**Review**



**EARSC**  
European Association  
of Remote Sensing  
Companies

**12-13 April Eurospace -  
EARSC Workshop with  
industry on CM22**

**ASD-EUROSPACE**  
The Space group in ASD

**23-24 March**  
**CM22 EO**  
**Programme**  
**Proposal**  
**Narrative**  
**workshop with**  
**Member State**  
**delegates**



**30<sup>th</sup> March**  
**DestinE Kick-off**  
**event with**  
**DG Connect**

Launch of the  
**Destination Earth**  
**Initiative**

Online event



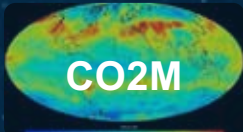
**Reorganisation of  
the Directorate**



# Earth Observation: highlights



## CSC4 - COM/ESA Joint Proposal



CO2M



LST



CRISTAL



CHIME



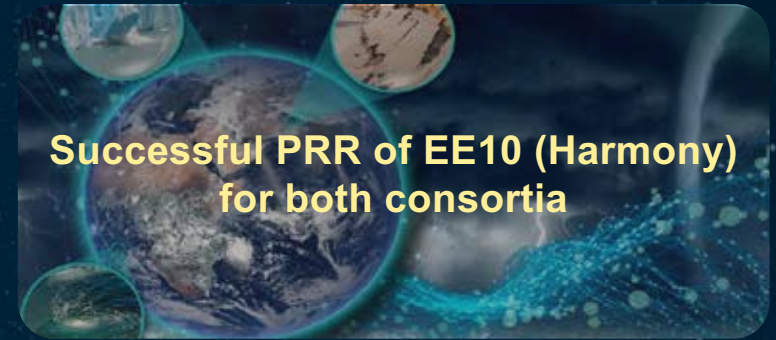
CIMR



ROSE-L



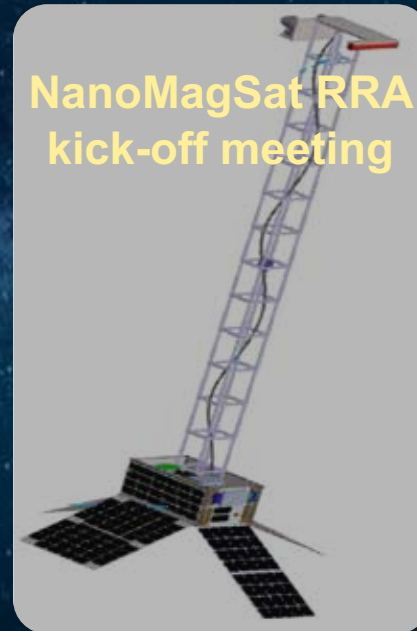
Signature of Sentinel-1C  
launch with Arianespace



Successful PRR of EE10 (Harmony)  
for both consortia



Progress on MTG  
testing activities &  
launch preparation  
with EUMETSAT



NanoMagSat RRA  
kick-off meeting



Sentinel CO2M Successful  
PDR in March

## FORUM

Contract signature in April

Forum will extend our view into the far-infrared (up to 100 microns).

FORUM

## EE11 Candidates (CAIRT, Nitrosat, SEASTAR, and WIVERN) proposals for Phase 0/A evaluated







# living planet symposium

## BONN 23-27 May 2022

TAKING THE PULSE OF OUR PLANET FROM SPACE

**1 Scientific Sessions**  
AGORAS Plenary Sessions

**2 Networking**  
B2B Meetings AGORAS  
Open Earth Forum

**3 Education Activities**  
Open Days School Lab

**4 Communication & Outreach**  
Press AGORAS Media  
High Level Strategic Sessions



### LPS22 in Numbers:

- 240+ Science Sessions
- 1370+ Oral Presentations
- 2250+ Posters (1 session/day)
- 80+ Agoras
- 30+ Networking events
- 60+ Countries (authors)

### Plenaries Sessions:

10+ thematic sessions:

- Opening Ceremony
- Climate change
- New Space
- Commercialization
- Accelerators
- Int. Collaboration in EO
- FutureEO
- CMIN22
- EO National Missions

**One single Programme**

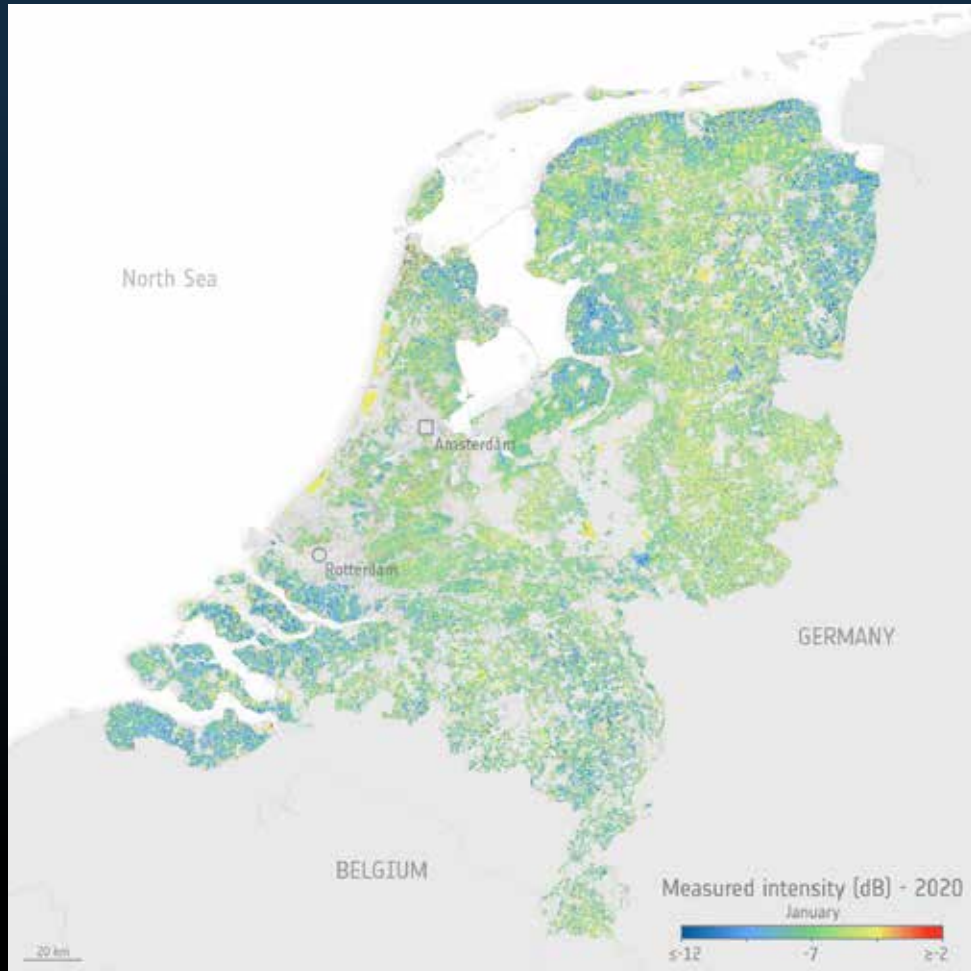




# A Few Examples of Recent EOP Activities

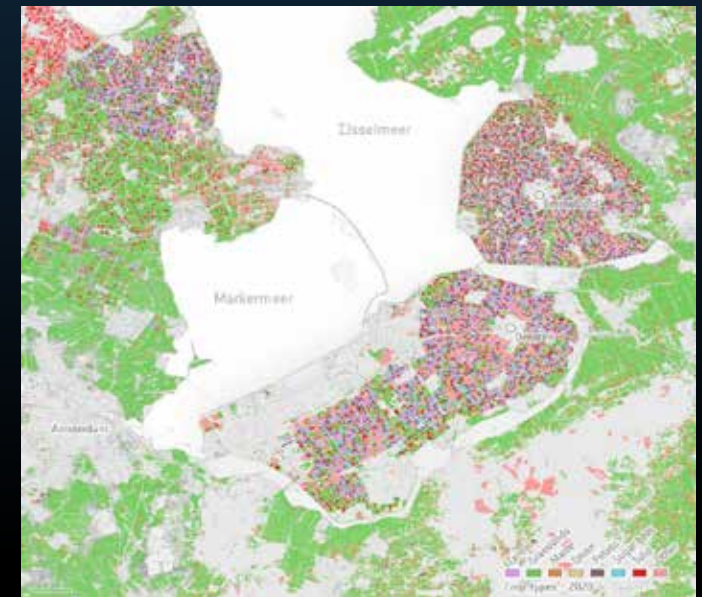


# Monitoring crop health across the Netherlands



Thanks to the combination of Sentinel-1 radar and Sentinel-2 optical data and a newly developed dataset tool, called Agricultural Sandbox NL, people working in the agriculture sector, but who are not satellite data experts, can monitor the health and development of crops, right down to each crop in individual fields.

**Animation of highlighting crops between January and December 2020**



**Crop type for all agricultural parcels Flevoland in the Netherlands**

11



# Major floods in Australia observed by Sentinel-1A



**Activation EMSR567  
from the Copernicus  
Emergency Management  
Service**

**Example of flood map near Grafton  
(New South Wales) based on both  
Sentinel-1A imagery acquired on  
02/03/2022 and COSMO-SkyMed  
imagery acquired on 01/03/2022**



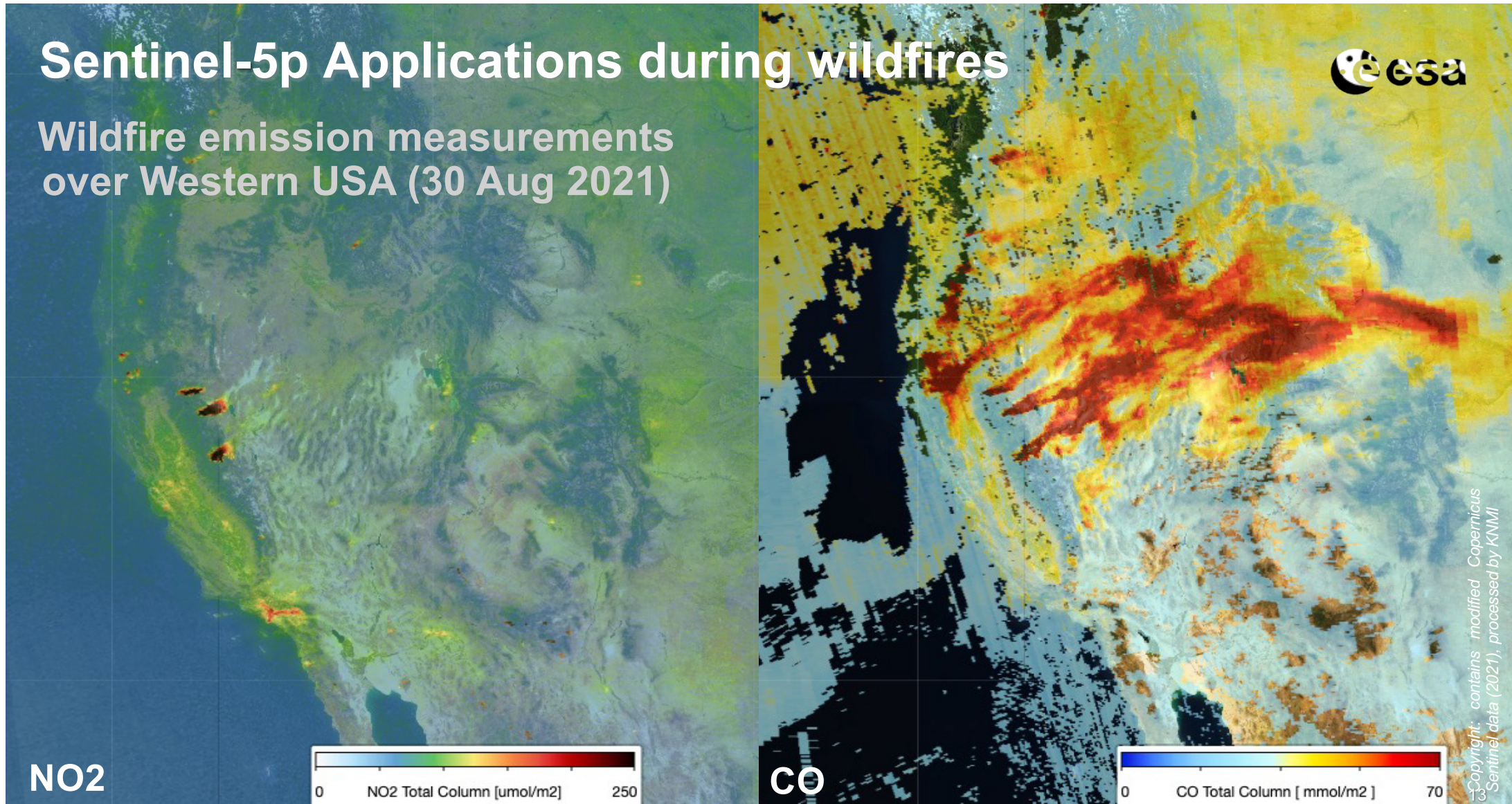
Copyright: Copernicus Service Information (2022) /  
Copernicus Emergency Management Service / processed by e-GEOS



→ THE EUROPEAN SPACE AGENCY

# Sentinel-5p Applications during wildfires

## Wildfire emission measurements over Western USA (30 Aug 2021)



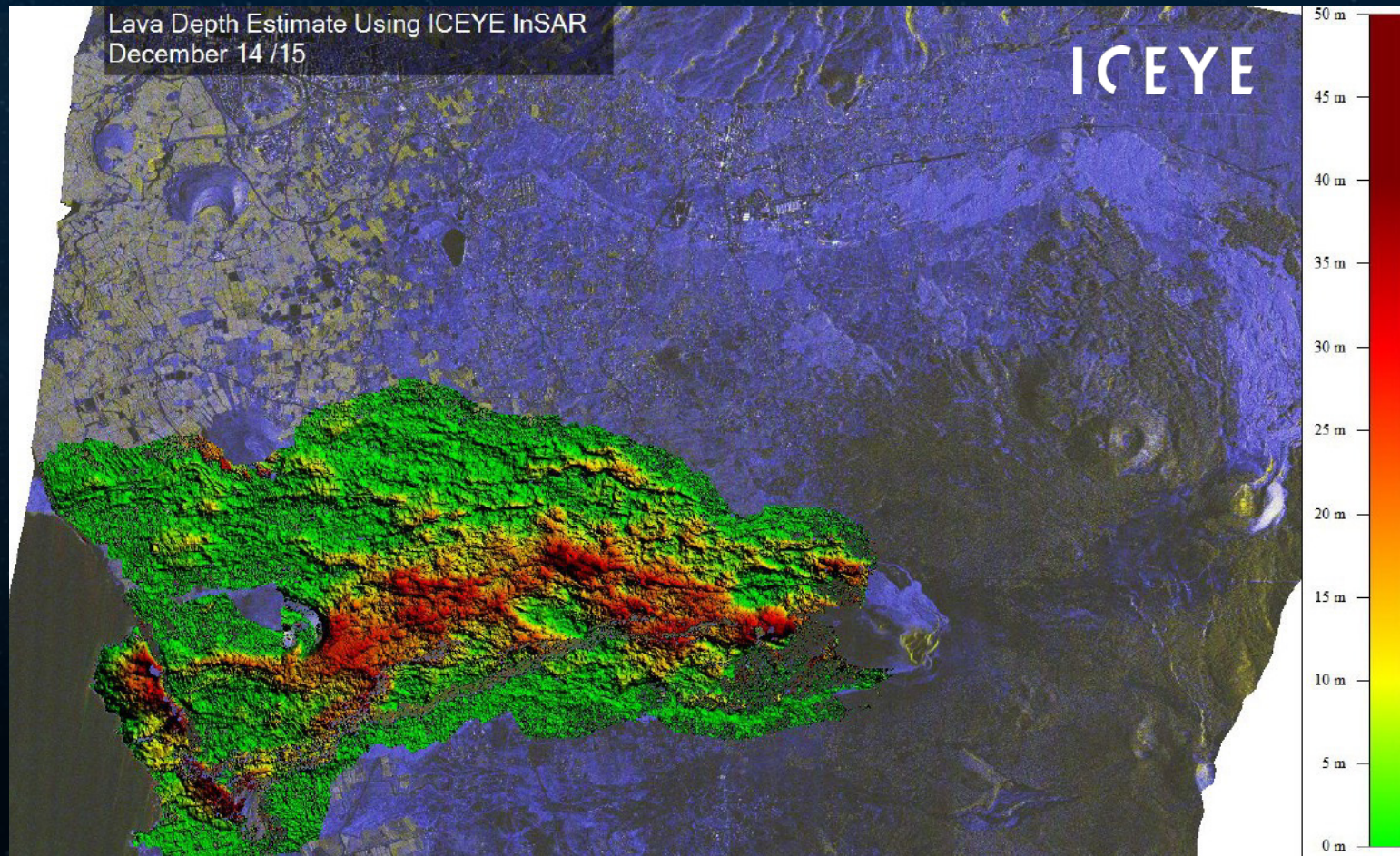
# Copernicus Contributing Missions



*La Palma  
eruption (2021)*

Pilot study with  
ICEYE and CEMS

*Lava depth  
estimates*





# Economic and Industrial Benefits Assessment of EO Security Activities


**Preliminary Key Takeaways** (Final report will be presented in May PB-EO)





## 4 best market opportunities identified for European industry

-  • Maritime domain awareness,
- Disaster management,
- Critical infrastructures
- Law enforcement

 By 2030, their addressable market value is estimated at \$576M for the European industry.

 Activities are considered to support European independence, thanks to more permanent and persistent observation systems

 An absence of ESA in these activities is seen as a potential high loss for stakeholders particularly to support their competitiveness.

 Beyond supporting technology development, ESA is expected to play a key role in harmonizing and coordinating MS and European agencies' needs and to coordinate the definition of common standards.



# ESA Climate Change Initiative and IPCC AR6



**ipcc**  
INTERGOVERNMENTAL PANEL ON climate change

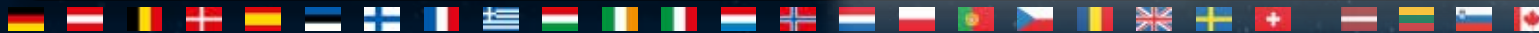
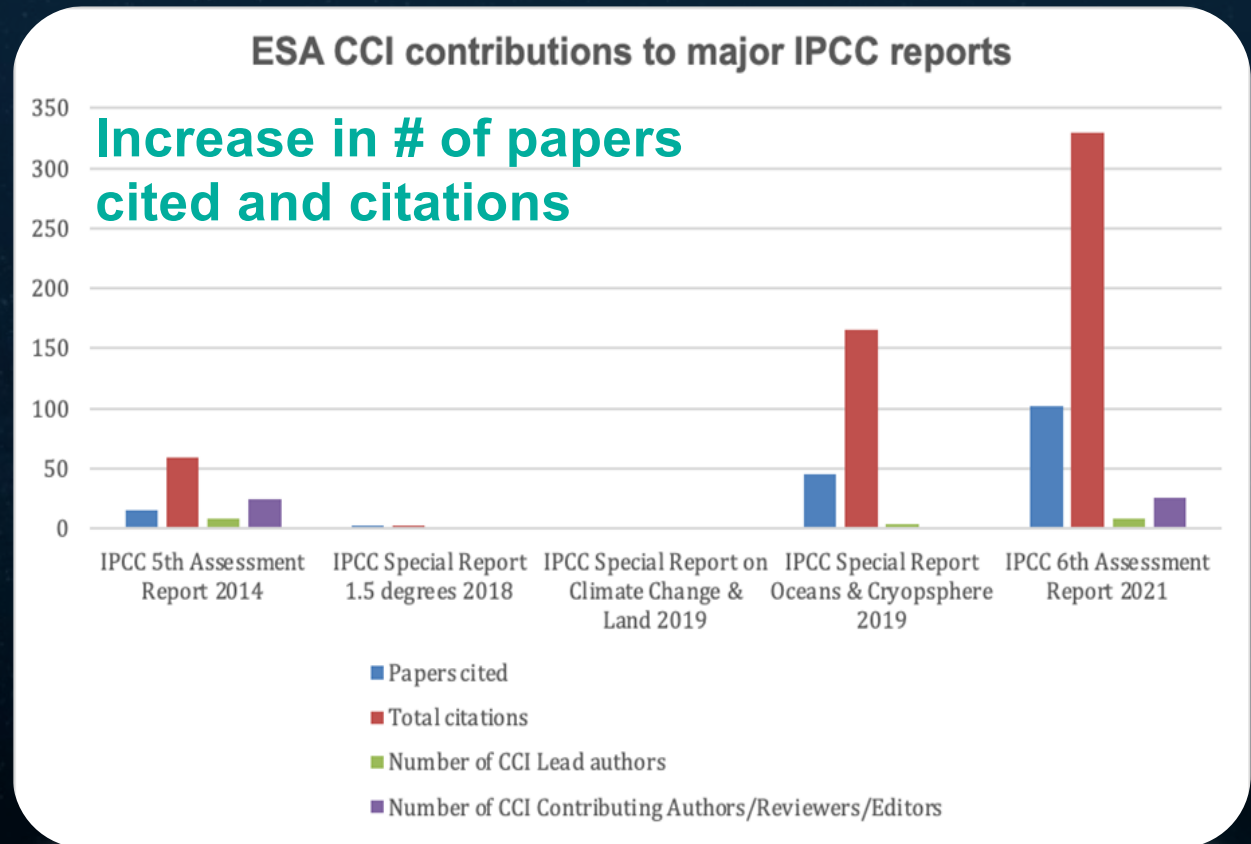
**Climate Change 2021**  
The Physical Science Basis

**AR6 WG1 report:**  
7 lead/coordinating authors  
14 contributing authors  
~10 expert reviewers  
~100 papers cited  
+300 in-text citations

Working Group I contribution to the  
Sixth Assessment Report of the  
Intergovernmental Panel on Climate Change

WGI

WHO UNEP





# Copernicus



## Sentinel-1B anomaly

- Sentinel-1B unavailable since 23 December 2021.
- Agreements with Canada and other radar data providers being jointly organised with the EC to continue supporting user requirements.



*First Sentinel-1B image, taken over 5 years ago*

Contains modified Copernicus Sentinel data [2016], processed by ESA

## Sentinel-1C Launch

- Signature of Sentinel-C launch with ArianeEspace, launch in first half 2023

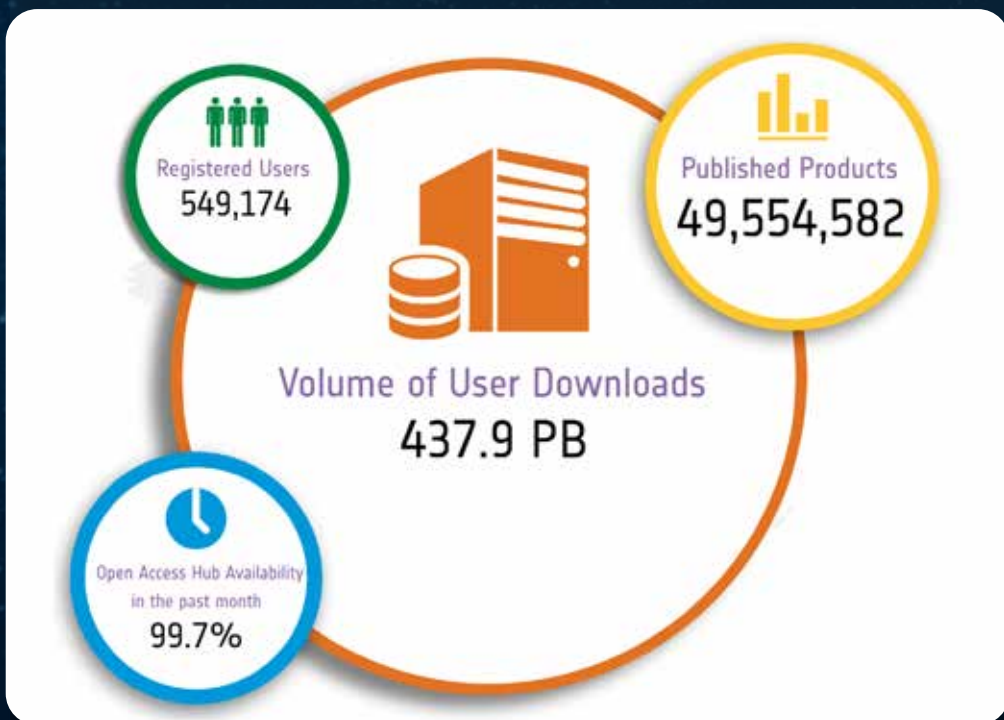


## Sentinel-expansion missions

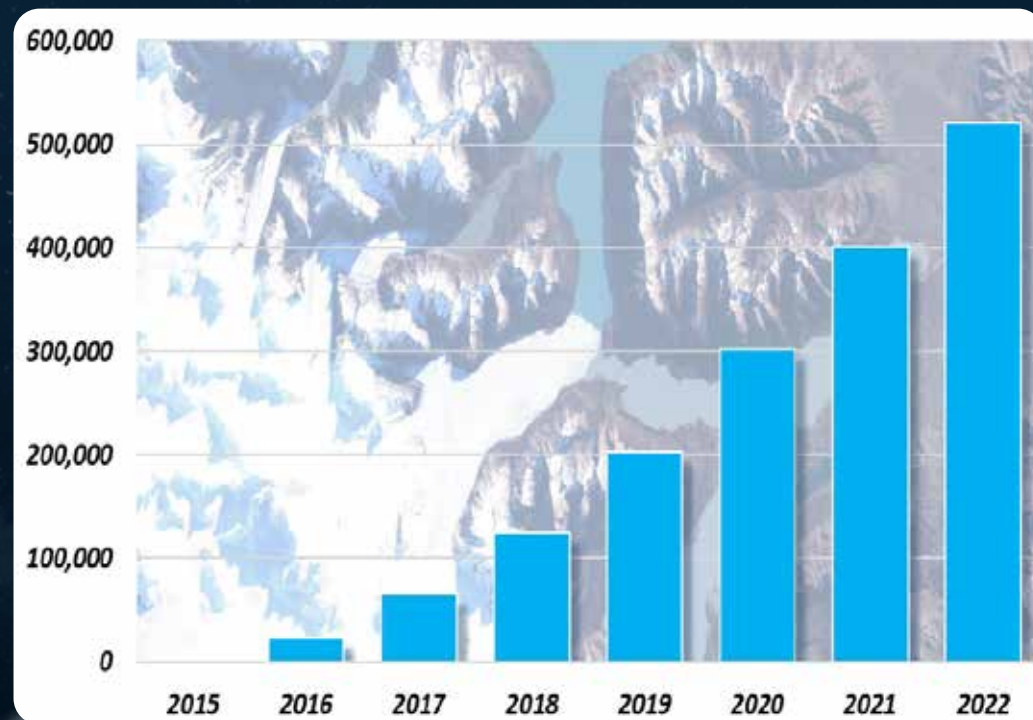
- Development activities progressing nominally and in line with the CSC LTS
- Industrial activities at both prime and subcontractor level progressing nominally with PDR for all Expansion Missions expected in 2022.
- **CO2M PDR already took place on 1<sup>st</sup> March**



# Copernicus Data Users Keeps Growing (Status end April 2022)



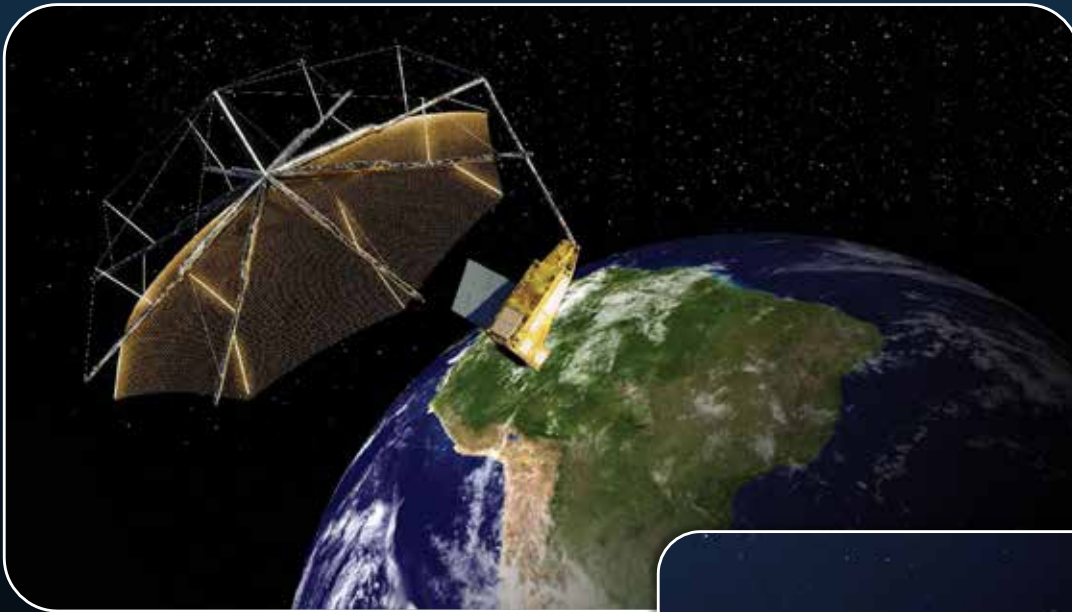
Registered Users, total data download and published products since start of operations



Evolution of Copernicus Open Access Hub Registered Users



# Earth Explorers



## Biomass

- PAS schedule agreed with MRR passed review, confirming the new overall mission planning
- Launch 2023-24 (impact on Russian aggression in Ukraine)



## EarthCare

- Successful repair of ATLID TLE
- Good progress of the CPR towards a repair in April
- Launch 2023-24 (impact on Russian aggression in Ukraine)





# EOP Programmes at CM22

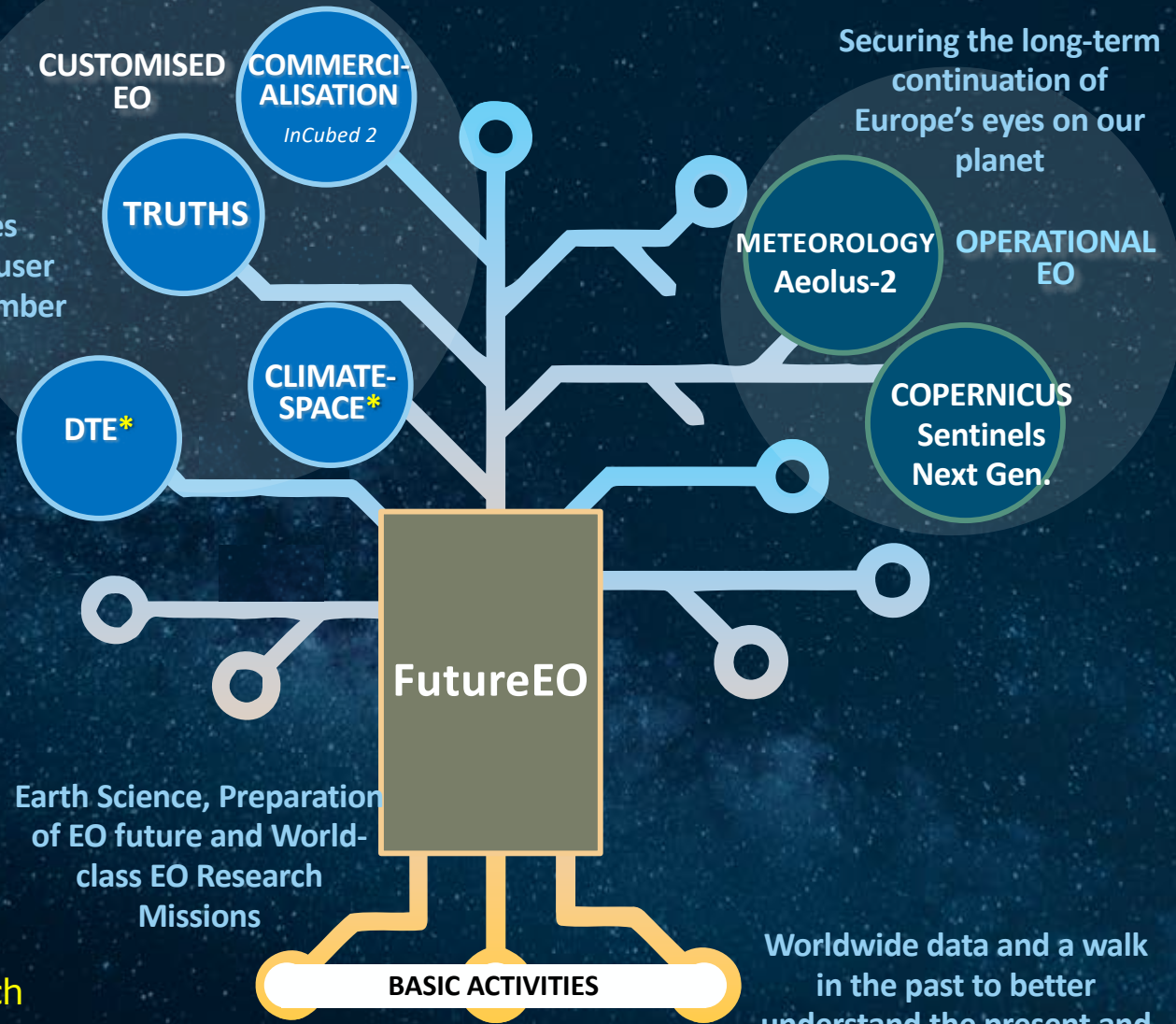


# EO Programme Package for CM22



Pre-operational activities  
answering demands from user  
communities, industry, Member  
States

Securing the long-term  
continuation of  
Europe's eyes on our  
planet



Earth Science, Preparation  
of EO future and World-  
class EO Research  
Missions

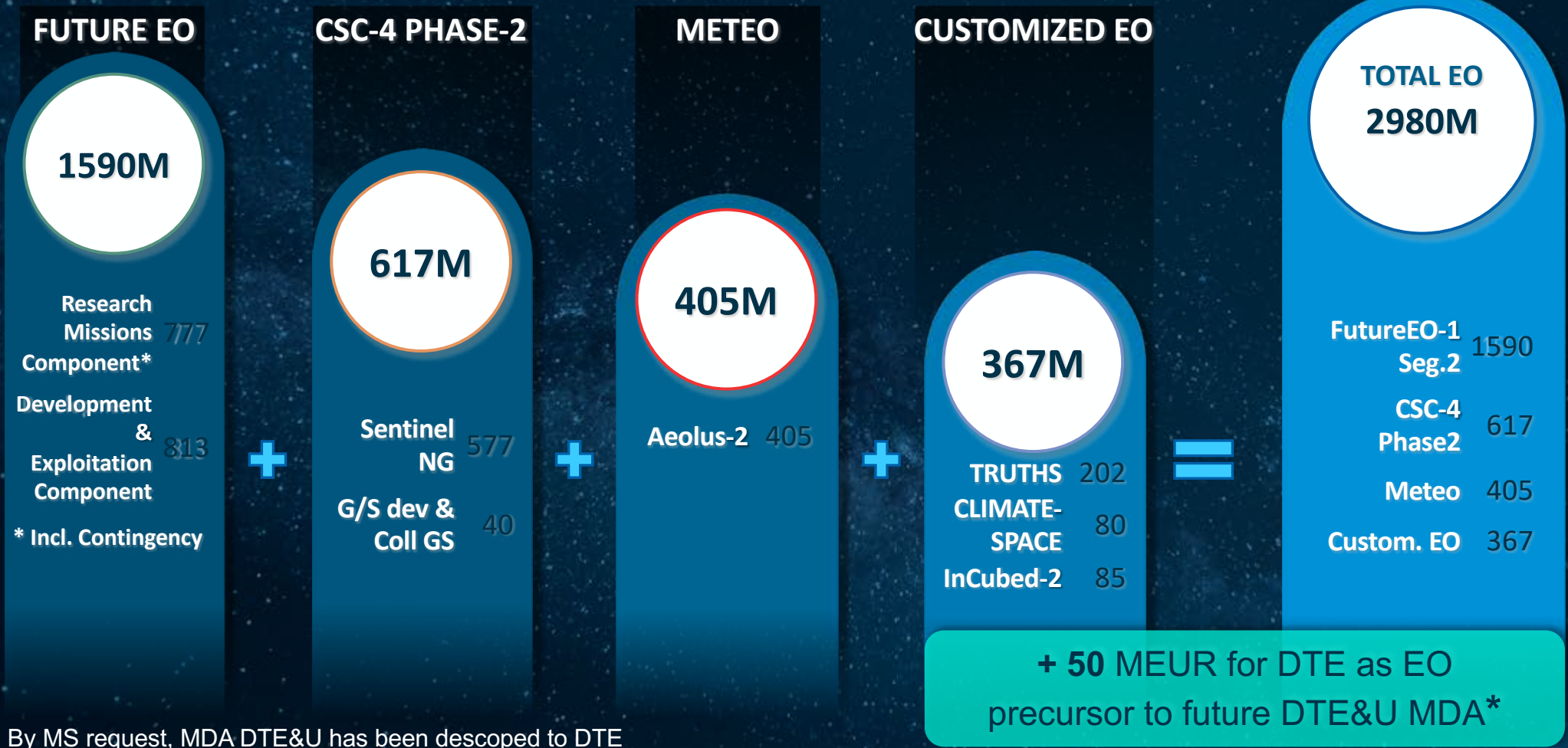
Worldwide data and a walk  
in the past to better  
understand the present and  
the future

\* Proposal for a merged approach  
to be discussed in May PB-EO

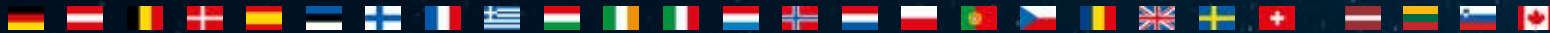


Earthnet    Heritage Space    DPTD

# Financial Envelope For CM22 (Work in Progress)<sup>e.c. 2022)</sup>



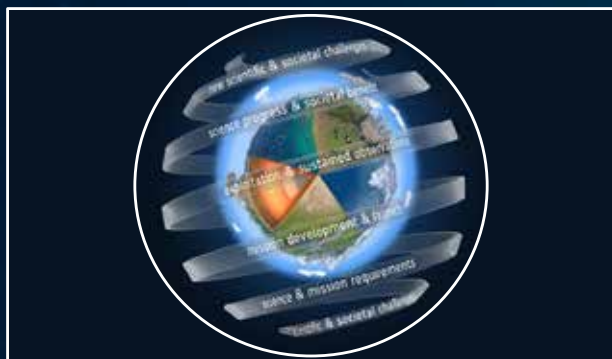
\* By MS request, MDA DTE&U has been descoped to DTE EO precursor component only of an EO programme, TBC



# FutureEO



## Earth Science, Preparation of EO future and World-class EO Research Missions



Foundations and Concepts



Research Missions



Mission Management



Earth Science for Society

Harmony



Scout 3 & 4



EE-11



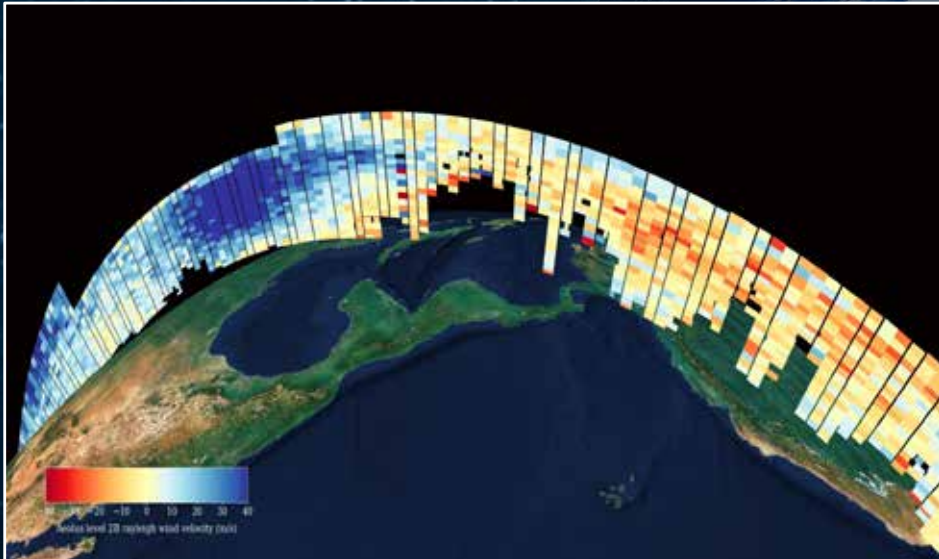
MAGIC/NGG



# Operational EO



Securing the long-term continuation of Europe's eyes on our planet



Meteorology - Aeolus-2

## Copernicus Sentinels Next Generation





# Customised EO



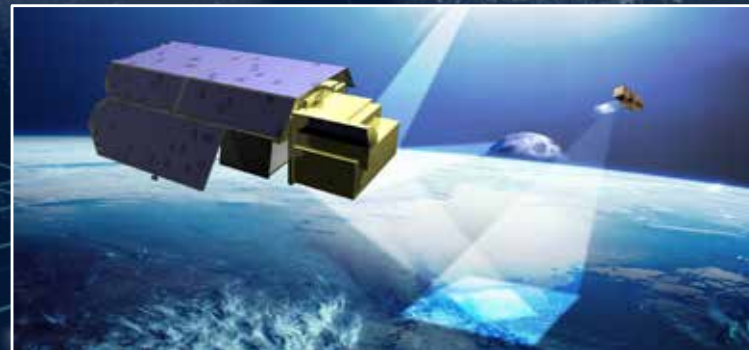
Pre-operational activities answering demands from user communities, industry, Member States



CLIMATE-SPACE



Incubed-2



TRUTHS



# Digital Twin of the Earth as EO Precursor to Future DTE&U MDA



(MDA DTE&U has been descoped to DTE EO component only of an EO programme, TBC)

## Dynamic and interactive representations of processes in the Earth System

### FutureEO

*Will foster a community effort to develop the scientific foundations, novel data and precursors of the Digital Twins and their evolution...*

### DTE

*Will ensure the operationalisation and integration of FutureEO results into a set of operational Digital Twins open to the community*

### ESA Digital Twins

DT  
Polar

DT  
Hydrology

DT  
Oceans

DT  
Carbon

DT  
Solid  
Earth

Derived from DTE precursor activities & defined/developed with scientific community, optimised to utilise ESA EO data assets

### DTE Platform Component

Integrating and linking Digital Twins Enabling visualisation/simulation/modelling functions without coding

### DTE EO Data Space

Cloudification of Earth Explorer-, Heritage- and relevant TPM-data  
Scalable data management for seamless ingestion in Digital Twins  
Interface optimisation for integrating other data sets (incl. Cop. data)



# EO Programme Package for CM22



**A coherent and comprehensive set of programme proposals has been consolidated for EO at CM22.**

**All the proposal components support key strategic challenges and priority policies at European level:**

- Climate crisis and COP agreements implementation
- Green Deal
- Decarbonisation of Europe

## **Additional priorities/focus**

- Organise dedicated activities in support of Ukraine (e.g. RACE-like initiative in FutureEO on food security and agriculture)
- Enlarge FutureEO block4 civil security activities in support of monitoring migration fluxes
- Or do this in the EO component of Space for Civil Security MDA
- MDA Space for Civil Security reinforces (joint TIA and EOP activities)
- All EO proposals to CM22 aim at giving European autonomy in terms of data access and technology (with some exceptions of dependencies on Ukraine/Russia)

27



# Accelerators: a new concept of action for Europe



- Focus on responding to urgent societal needs
- Upscale existing space investments to the next level
- Users at the centre
- Strengthen European leadership and STEM
- Attract new funding sources
- Combine strengths of ESA, EU, Member States and the commercial sector



# Accelerator 1: Space for a Green Future



**Quantum  
missions for  
climate**

+



**Digital Twin  
Earth**

+



**Green  
transition  
information  
factories**

**+ Accelerating decarbonisation & sustainability  
= Supporting the climate neutrality by 2050 objective**



# ESSC Comments on EOP CM-22 Programme Proposals

- EOP CM-22 programme proposals circulated to ESSC on 24/2/2022
- ESSC comments received on 31/3/2022 – Thank you !



# CLIMATE SPACE



**CLIMATE SPACE is a highly ambitious and timely programme, much needed to address the challenges posed to society through climate change.**

**The contributions of CLIMATESPACE to climate science and climate services, and in particular to the UNFCCC Paris Agreement process are well described. However, the document could be strengthened by improving on the balance between the descriptions of how ESA intends to achieve the different programme aims. In particular, more detailed description on how to achieve the ‘Global Cycles, Tipping Points and Climate Sensitivity’ goals would be welcome.**

## Answers:

- ESA's Climate Change Initiative and the new climate initiative Climate-Space respond closely to the requirements outlined in the GCOS Implementation Plan with regard to the ECVs. First discussions point to the fact that GCOS will move away from looking only at individual ECVs and more towards cycles. This is a point that has already started to be addressed through cross-ECV activities in CCI+ and will be continued under Climate-Space, through for example activities such as Sea Level Budget Closure (SLBC).
- On Tipping Points, ESA in collaboration with ISSI is currently organising a detailed TIPMIP workshop in October 2022. This is based on a first review exercise defining the EO requirements for the Tipping points community in 2021. On the basis of this detailed review the design of the intended 1-2 medium size projects (~1-2 Meuro) will be based.
- On Climate Sensitivity, this is clearly a point that we would like to address through our – now – closer link to the climate modelling community through hosting the WCRP CMIP-IPO



**What are the prospects and time frames of exploration vs exploitation of such (again very valuable and innovative) technology?**

**Will the ESA call on EO4SOCIETY be totally open in terms of objectives?**

**What does the EO Africa project consist of?**

**Links with UNFCCC, ECMWF, EUMETSAT, EU Horizon Europe, etc. ?**

## **Answers:**

- Approx 2/3 of the FutureEO budget is dedicated in building new missions (EE10 Harmony, SCOUTS, and preparing for NGGM) for operating and managing the flying missions
- Preparing for new technology and supporting to “EO science for society) is approx. 1/3 of the budget
- New activities foreseen in Block 4 such as “Sentinel Users Preparation” to prepare the community to the Copernicus Expansion missions
- Open Call fully open and transparent driven by innovate solutions to EO
- EO Africa started at CM-19 and will be continued at CM-22 : African-European R&D partnership to facilitate the adoption of EO and related space technology in Africa, driven by African user needs
- All activities based on users needs (workshops and consultation) and close collaboration with partners (ECWMF for DestinE, DG-RTD for Grand Science challenges)





# FUTURE-EO – MISSION OF OPPORTUNITY



The document is unclear on the missions of opportunity. The document highlights 2 missions, potentially developed in cooperation with NASA: a Daedalus-type mission to study the lower thermosphere-ionosphere and MAGIC (a GRACE-type mission for measuring mass changes in the Earth system). Depending on the section pages, the document seems to favour either one or the other. Both missions are important. MAGIC has strong support from the whole EO community considering its multidisciplinary applications (climate and cryospheric sciences, oceanography, hydrology, geophysics, etc.).

What are ESA intentions on the missions of opportunity?

## Answers:

- ESA and NASA are involved since 2011 in cooperation discussions on gravity missions under the JPPG umbrella in order to realise global user community's vision of a mass change constellation
- The ESA/NASA MAGIC Missions Requirement Document (MRD) was released in October 2020 including the global user requirements
- ESA's first activities for NGGM commenced in 2003 following ACEO/ESAC recommendations in response to mission proposals to ESA (e.g. Licody, 2002, e-motion2, 2015)
- MAGIC is the first step of a long-term vision for enhanced continuity of sustained mass change products at higher spatial and temporal resolution that can directly feed operational services (e.g. Copernicus)
- MAGIC, being the first mass change constellation, is a necessary step for realising the long-term goal of Quantum Space Gravimetry (QSG) which is expected to deliver enhanced products that contribute to enhanced climate change monitoring and transition to green economies
- Daedalus – as important as MAGIC but would come in a 2<sup>nd</sup> phase, based on a very good EE-10 proposal.
- Daedalus – in very close collaboration with NASA Heliophysics Division



## **Q1 : How does ESA intend to coordinate Heritage Space with Copernicus Services ?**

*→ HS ensures access and improvement of heritage data for research & operational applications. Copernicus Services can freely and openly access all these data for their purpose. Consultation activities with users (including Copernicus Services) to collect requirements and needs related to heritage data are included in the HS programme proposal.*

## **Q2 : How to ensure that the data archive is at the best level possible (state of the art calibration files and approaches) through time (including retrieval algorithms improvements when involved)?**

*→ Consolidation, improvement and reprocessing activities are periodically performed on high priority heritage datasets (due to affordability) to add newly recovered data, improve data quality, and implement latest algorithms to align with newer missions (e.g. implementation of Sentinels formats and algorithms). Concept of Fundamental Data Records was introduced at CM19 to reinforce harmonization and calibration across sensors and missions. New FDRs planned after CM22 (depending on funding allocation).*

**Q3 : How are the activities coordinated with similar efforts done by other agencies (avoid duplication and possibly agree on formats etc...)?**

→ *Coordination with other agencies is ensured through the European Data Access and Preservation Working Group, the CEOS Cal/Val Working Group, and the CEOS WGISS Working Group. These groups allows to share lessons learned, experiences, approaches and tools for data preservation/discovery/access/valorization, and to conduct joint projects and activities. See for example <https://ceos.org/ourwork/workinggroups/wgiss/preservation/>*

**Q4 : Exploration of ML/AI for archives mining. Is there a particular agenda for this? Later the use of AI for data analytics is just « nice to have ». Please clarify this (apparent) contradiction in priorities, and the plans to eventually develop.**

→ *Heritage Space is a multi-directorate programme so priorities can vary depending on the specific directorate (this explains the apparent contradiction). The provision of advanced data access tools and research environments, possibly using ML/AI technologies, is overall considered important and included in the programme proposal but will most likely be postponed/descoped due to lack of resources.*

ESSC finds that some lack of coherence in the high-priority Copernicus missions and others as the new missions envisioned are not necessarily demonstrated (hence rather Explorer-type mission like Chime for instance) or redundant with other missions (LSTM/trishna, Rose L NISAR, etc) which are also sometimes exploratory. We could have expected to see validated Earth Explorer missions to be in the selected missions.

#### Answers:

- The evolving needs of the Copernicus services remain the key driver for the evolution of the CSC. Therefore, the expansion of the CSC were considered based on emerging EU policy and service needs as prioritised by the Commission
- The Expansion Sentinels component corresponds to the enlargement of the present measurements through the introduction of new missions to answer emerging and urgent user requirements and was following a gap analysis of current measuring capabilities.
- The missions and the various trade-offs are discussed in the Copernicus Long-Term Scenario LTS in the context of four observational capability families: Microwave Imaging Family, Optical Imaging Family, Topographic Measurement Family and Spectroscopic Atmosphere Measurement Family. In general, the Expansion Sentinels mission designs strive for an optimal level of effective complementary with regards to the NG mission designs. The complementarity to existing missions are described in the LTS.

Considering that Aeolus provides a useful contribution to the global observing system (in <https://www.ecmwf.int/en/e-library/19538-nwp-impact-aeolus-level-2b-winds-ecmwf>) one may want a better justification to push forward this mission rather than others of equivalent merit but less risky or of reduced costs.

How will ESA ensure more efficient phases BCD, and control costs while improving data quality?

## Answers (1/2)

- Aeolus-2 will build on the heritage and expertise gained from Aeolus and ATLID on EarthCARE. In particular, Aeolus has already demonstrated a Technology Readiness Level of 9 for all the critical technologies. ESA has undertaken an extensive lessons learned exercise based on the development and in-orbit experience of Aeolus and the development experience of the ATLID and MERLIN lidar instruments. Based on these lessons learned, technology pre-developments are already on-going to correct observed in-orbit anomalies (e.g. hot pixels) and to extend the lifetime / robustness (e.g. laser transmitter power and lifetime), which will overall improve the data quality. In addition, the number of vertical channels in the atmosphere will be increased by a factor of 2, to improve the data quality.
- All this will help secure the Phase B2/C/D schedules and minimise technology development risks.

## Answers (2/2):

- Aeolus has been affected by a continuous reduction in the atmospheric return signal over time, which has been found to be due to laser induced contamination in the shared transmit / receive optics and a misalignment of the return signal and the aperture stop.  
Therefore, it has been decided to change from a “mono-static” (shared optical path for transmit and receive beams) configuration as used on Aeolus to a “bistatic” (completely separated transmit and receive optics) configuration as used on ATLID for Aeolus-2. This allows to implement redundant transmit optics, where laser induced contamination can occur, and to eliminate a single point failure.  
In addition, a beam steering mechanism and better thermal control of the primary mirror, will improve the alignment of the receive optics.  
Furthermore, the laser transmit optics will be contained in a sealed and pressurised structure with an oxygen atmosphere which will significantly reduce the risk of laser induced contamination.
- All the above measures will increase the return signal levels and improve the robustness of the design.
- Finally, it is worth noting that a recent value of information study undertaken by London Economics on behalf of ESA has identified a total value of the direct and indirect benefits from 10 year of in-orbit observations from Aeolus-2 of € 7.1 billion, which represents a factor of 7 on the total ESA and EUMETSAT investment in a collaborative Aeolus-2 Programme.

Very ambitious and broad agenda, but the document is not specific about the «how», in particular when it comes to:

(1) Integration of models and data with artificial intelligence (AI) and machine learning (ML). Some statements are vague and rather bold. How data integration will be made systematic? How can AI fuse different sensors automatically? Citizen science and the human in the loop are apparently seen as an active player, but mechanisms are not detailed to ensure trustworthiness and robustness (only appears to «ensure traceability»).

(2) Digital Twin Earth builds on a (not new concept) of modelling+data+interface+API+HPC complex systems, in this case, other initiatives do essentially the same. In a similar vein, the CliMA (Climate Modelling Alliance) in the US pursue similar goals. Several others in Asia and Australia are on their way. None is mentioned and the position of ESA is not clear in this regard; collaboration, competition, reinventing the wheel?

(3) Use of AI technology that is in its infancy, not available or largely dependent on (inexistent) labelled data: e.g., «complex analyses (e.g., “what-if” analysis) will require the development of advanced AI-based analytical and reasoning functions for large-scale HPC-based models. » implies the use of counterfactual modelling and causality.

## Answers:

- ESA Council in March suggested to limit DTE&U only to EO => DTE
- AI/ML basic R&D developed in the frame of the FutureEO activities. DTE will make use of the latest AI technology but is not about new R&D development
- DTE to ensure a strong European position/independence as this field is developing extremely fast
- DTE not only about AI/ML but includes a strong component on Earth science models, EO digital platforms, and access to large amount of data (cloud.HPC)



# Support of ESSC to update the EO Science Strategy (initial Steps for Boost Future EO Early Phases)





# Boost FutureEO – Early Phases



Concerns expressed by the community at large about attractiveness and outcome of recent Earth Explorer Calls whereas expectations remain high (“to provide world leading science using yet-to-exist EO techniques”)

## EE-10 Lessons Learned

*Meaningful science has a cost*

*Those large Explorers we want to build collectively*

*We want innovation and scientific excellence*

*Let's be bold*

*Earth Explorers are the heart of the programme*

*We want scientific competition*

*Let's avoid last minute bad surprise*



- **Attract new proposals**
- **Attract bolder proposals**
- **Foster more competition**
- **Foster longer maturation**
- **Better mitigate the cost and schedule risks before missions get selected**



# “The Global scenario” – The new Executive’s proposal



A Global scenario with 5 steps:

Step 1: New approach to a revision of Living Planet Challenges including observational gap analysis

Step 2: New EO Mission Ideas (NEOMI)/On-boarding activities

Step 3: Call for ideas followed by Phases 0 and maturation activities for ‘commended’ missions

Step 4: Selection of missions for Phase A and implementation of Phase A

Step 5: Selection of missions for implementation followed by Phase B/C/D/E1

- This global scenario is **cyclical, synchronised with CMs**, can be further improved (lessons learned)
- It capitalises on a **strengthened interaction with the Science Community** (ACEO, UCM, LPS, on-boarding of a new generation of scientists)
- It provides a **long-term perspective** for the preparation of Earth Explorer missions (and beyond).
- Full steps will be fully deployed as from EE-13; scenario adapted for EE-11 and EE-12.



# Update of the EO Science Strategy



- Update of the EO Science Strategy recommended by EOEP/FutureEO Independent Science Review (ISR) and confirmed during the recent Programmatic and Technical Review (PTR)
- Based on the work developed in the Boost FutureEO - Early Phases Steps 1 and 2
- Step 1: Towards a renewed EO science strategy
  - Part 1: EO Science Strategy Foundation Studies
  - Part 2: Definition Phase – Formulation of Strategy
- Step 2: New EO mission ideas (NEOMI)

**Objective:** Updated EO Science strategy in place by Q4 2024 to drive the scientific scope/content of the EE13 Call for Mission Ideas (Call Q1 2025) and to guide NEOMI Study ITTs



# Status of the EO Science Strategy Foundation Studies



- Discussed and concept endorsed by ACEO on 3 February 2022
- Mainly to review the Living Planet Challenges and identify potential new challenges (and gaps)
- Statement of work (SOW) being finalised with an Invitation to Tender (ITT) release foreseen by mid-May 2022
- (up to 3) Studies to be kicked-off on 1 Oct 2022 till end of 2023
- Early results available by mid 2023 and a workshop planned with ACEO
- Workshop and consultation with the the science community planned in 2023 and 2024 (ESSC involvement)
- Roadmap for the update of the EO science strategy to be presented (and discussed) with the community during the LPS'22



Process driven by ACEO but ESSC to be defined but involvement welcome



# LPS 22 – Open Forum on EO Science Strategy (1)



- “Deep Dive” Agora Session – Open Forum “On the way forward towards updating the ESA Earth Observation Science Strategy ”
- Friday 27<sup>th</sup> May 2022, 08:30-10:30hrs (option for Wed 25<sup>th</sup> – but climate day clash)
- Co-chair by Florence Rabier (ACEO Chair) and Johnny Johannessen (ISR chair)
  - Introduction by the Chairs
  - Presentations by ESA of the roadmap for the update of the EO Science strategy emphasising:
    - EO Science Strategy Foundation Studies
    - Capture of observation gaps and cross-cutting science challenges
    - Interaction with the community
  - 45’ Q&A and discussions with the audience

**All ESSC members invited to participate**





# ESSC to organise the selection of the ESA-EGU EO Awards



# ESA-EGU EO Excellence Award – Competition Open



Honouring early career researchers or – teams for outstanding contribution to innovative use of Earth observations for science and applications, based on European satellites.

Idea for a dedicated EO Excellence Award by ACEO Meeting in 2019

Nomination process 1 September - 2 November 2020 through the Award web-page: [www.eoxcellence.com](http://www.eoxcellence.com)

Evaluation early December – 31 January 2021 through dedicated and secured online data-base.

Selection of winning Team and Individual took place mid February 2021 through Award Selection Committee of high ranking EO scientists

Winners were announced at the EGU General Assembly on 19 April 2021 during a dedicated Award Ceremony

Prize: ESA certificate of honour and funds for EGU participation



ESA UNCLASSIFIED – For Official Use



THE EUROPEAN SPACE AGENCY



## EARTH OBSERVATION EXCELLENCE AWARD

The European Space Agency (ESA) together with the European Geophysical Union (EGU) is awarding this certificate to

**Benoit Meyssignac**

*in recognition and appreciation of outstanding contributions to science and applications using European Earth observation satellite data.*

Date, Signature (ESA)

  
Josef Aschbacher, Director General of ESA



Date, Signature (EGU)

  
Alberto Montanari, President of EGU



## EARTH OBSERVATION EXCELLENCE AWARD

The European Space Agency (ESA) together with the European Geophysical Union (EGU) is awarding this certificate to

**The Hydrology Team of the National Research Council  
Research Institute for Geo-Hydrological Protection**

**Luca Brocca, Stefania Camici, Luca Ciabatta,  
Christian Massari and Angelica Tarpanelli**

*in recognition and appreciation of outstanding contributions to science and applications using European Earth observation satellite data.*

Date, Signature (ESA)

  
Josef Aschbacher, Director General of ESA



Date, Signature (EGU)

  
Alberto Montanari, President of EGU



# ESSC to organise the selection of the ESA-EGU EO Awards (1)



## Potential role of ESSC:

- To comment the text of the call, including whether the distinction between the two different types of EO Excellence Award we used in 2020 (Early Career Scientist and Scientific Team Awards) should still be used
- To propose selection criteria
- To invite and convene the Science Committee to perform the selection (no limit but we would suggest approx. 10 persons), though the number of reviewers will depend on the number of proposals received. On top, ESA and EGU should be invited as observers in the committee. You may want to use some of the members from the previous committee established in 2020 but it will be ESSC responsibility to appoint the committee.
- To evaluate the proposals received
- To select the best proposals based on criteria known in advance of the call
- To write a short report on each of the applications and of course rank them

Note that reviewers will have to sign a Non-disclosure Understanding (NDU)

Timeline: Call published in September with deadline end of November 2022 (TBC)

ESSC to evaluate the proposals from 1 Dec 2022 to 28 Feb 2023



If agreeable, ESA/EGU and ESSC to formalise with an exchange of letters

# ESSC to organise the selection of the ESA-EGU EO Awards (2)

## On ESA role:

- Organize the web site (advertisement of the Call, processing and handling of the proposals)
- Write the draft text of the call
- Provide all the dossiers received in electronic format to ESSC
- Financial Support (limited) for the secretarial work during the ESSC evaluation
- Cover for the expenses for the participation of one meeting of the Selection committee
- One ESA representative to be observer in the Selection committee
- Ensure overall coordination with EGU

Decision to be taken before 20 May 2022 so pre-announcement of the Call to be made at LPS'22 and EGU'22

If agreeable, ESA/EOP and ESSC to formalise with an exchange of letters



# MAKE SPACE FOR EUROPE

[www.esa.int](http://www.esa.int)

ESA UNCLASSIFIED – For ESA Official Use



→ THE EUROPEAN SPACE AGENCY