Future Earth Observation

Pillar 3: Earth Action

ONLINE INFORMATION DAY

28th April 2026

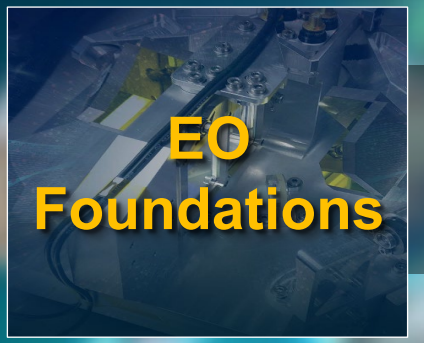
Climate Action, Sustainability and Science Department

ESA Earth Observation Programmes Directorate

ESA UNCLASSIFIED – Releasable to the Public

FutureEO Programme, embracing Climate Change Initiative and Global Development Assistance

FUTURE EO



Preparing **all future missions + technologies** for science and operational (Met & Copernicus) programmes



Developing of missions and associated ground segment and reinforcing innovation to **deliver space data into the broader economy and society**



Science, Applications, Innovation and creating business opportunities and jobs. Encompasses former **EO4Society**, **Climate Change Initiative** (CCI) and **Global Development Assistance** (GDA)



Delivering actionable climate and environmental information

Earth Action: Using Earth Observation data to take informed decisions and actions that respond to the challenge of understanding and sustainably managing Earth's environments.

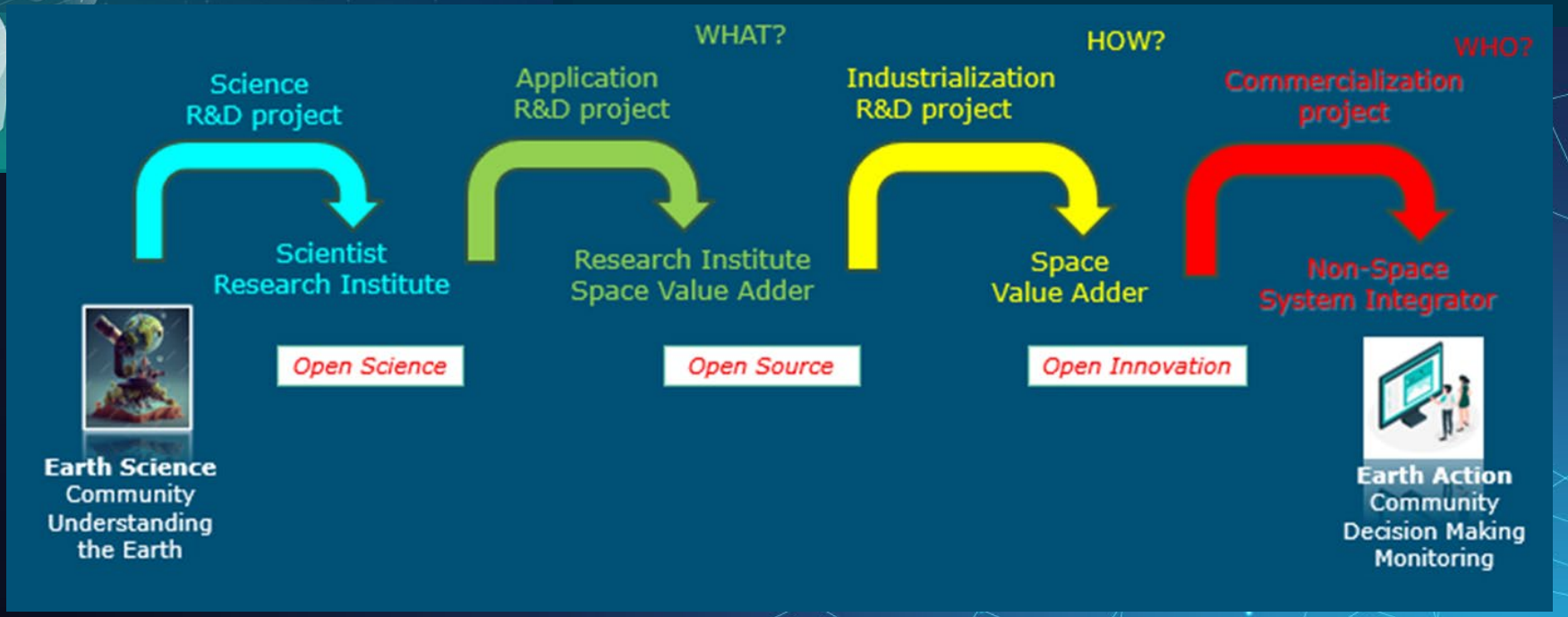
Addressing the "triple crisis"

Climate Change, Biodiversity Loss, Pollution/Waste

through **actionable climate** and **environmental information** and **solutions** for **society,**

while fostering **disruptive innovations**

and **business ideas**



EARTH ACTION

Defining our priorities along the following verticals:



1. Earth System and Climate Science



2. Enabling Policies

Transversal Elements Supporting All FutureEO Activities:



A. Industrial Strategy & Competitiveness



B. Disruptive Innovation & Digital Enablement

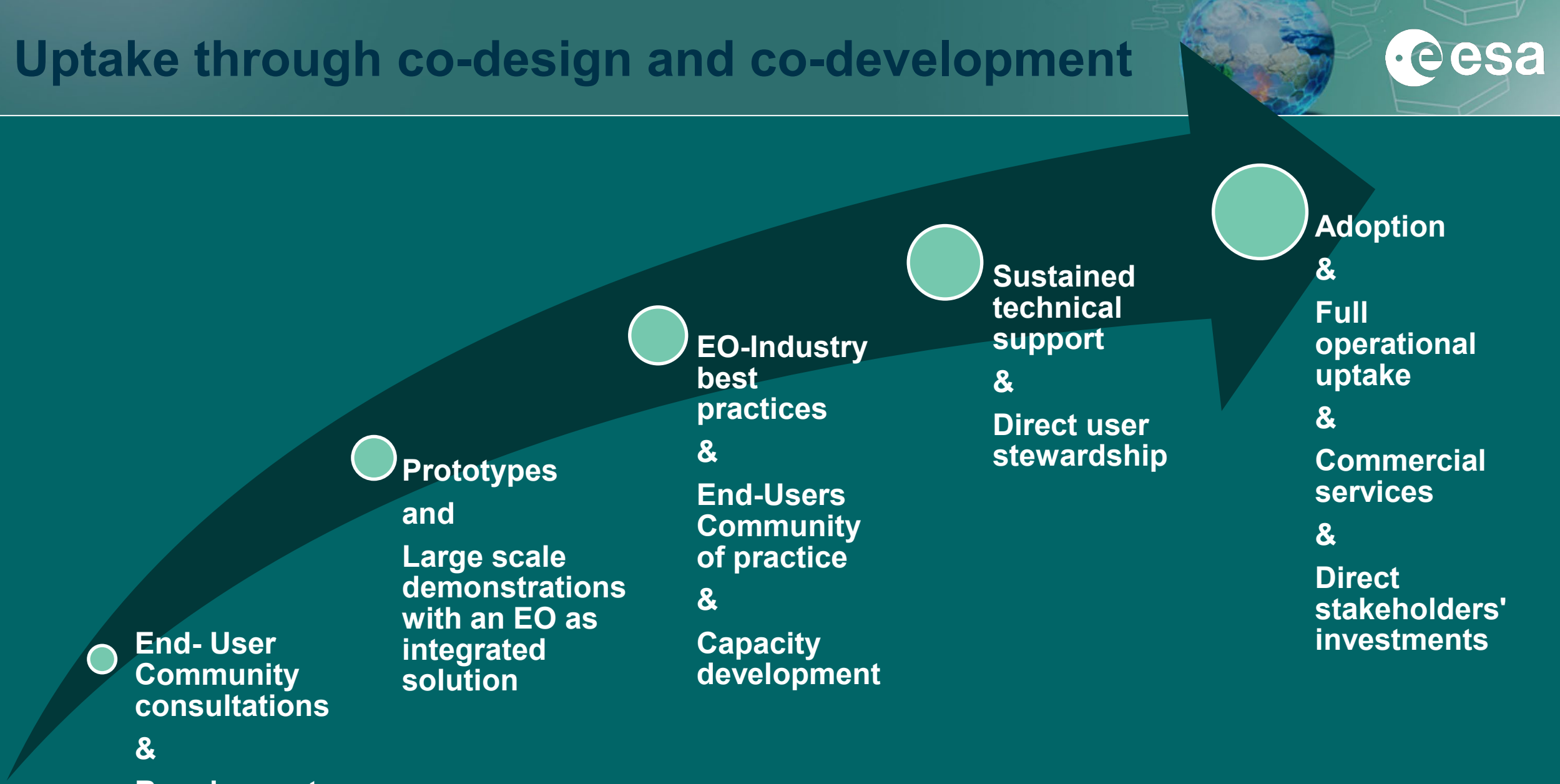


C. Knowledge Exchange & Capacity Building



D. Partners & Cooperation

Uptake through co-design and co-development



Earth System and Climate Science

Earth Observation Science Strategy

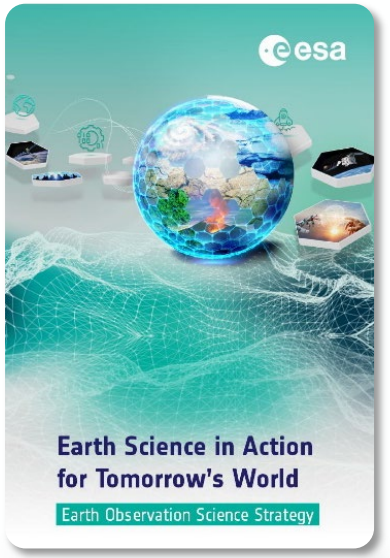
The driver

- Earth Action **strategic priorities** directly developed following the structure of the EO Science Strategy
- Earth system and climate science activities will be tightly linked and described in relation to the **six over-arching themes**

ST-I	ST-II	ST-III	ST-IV	ST-V	ST-VI
The water cycle	The carbon cycle and chemistry	Energy fluxes	Ecosystem health	Extremes and hazards	Interfaces & coupling in the Earth system

Overarching Science Themes

- All **new activities** will be explicitly mapped to the EOSS
- **Monitoring and evaluation** in the frame of the Earth Action impact analysis and reporting during annual updates of Earth Action Strategy in workshop with Participating States



Strategic Areas of Action
Earth Action 3-year goals

A1 Frontier Science and Discovery: a strong foundation

- Breakthroughs in the understanding of the Earth system & climate science
- Address evolving knowledge gaps
- Provide European leadership in Earth System & climate science
- Consolidate and extend international science collaboration

A2 From Science to Benefits: meeting society's needs

- EO Policy implementation roadmaps and guidance
- Contribute R&D and methodology development to main policy frameworks
- Build strategic collaborations with space and non-space partners
- Evolve resilience expertise and capabilities Advance predictability science

A3 Reducing critical knowledge gaps: taking expedient action

- Boost Industrial Competitiveness
- Formulation of an EO strategy for commercialisation

A4 Filling critical observation gaps: preparing for tomorrow starts today

- EO Science Roadmaps
- Establishing dedicated feedback loop between mission operation and exploitation experts and space infrastructure developers

AI-REACT

Strategic assessment activity to evaluate the readiness of artificial intelligence to support Earth system science and future ESA Earth Observation mission concepts.

The activity will:

- Assess AI approaches across the EOSS Overarching Science Themes, with a focus on identifying where AI is already delivering credible scientific value, where important scientific and technical gaps remain, and where maturity is sufficient to support mission-facing tasks.
- Build a structured evidence base, assess scientific rigour and mission relevance, and develop an AI readiness framework aligned with ESA readiness principles, leading to a prioritised roadmap for FutureEO investments and follow-on actions.



A core outcome of the study is a decision-ready assessment of where AI can credibly strengthen future EO mission science and planning, and where further evidence or development is still required.

Target budget: 400 kEuro

IMPACT-10

IMPACT-10 will assess the scientific and socio-economic impact of ESA's Earth Observation Earth and Mission Science activities:

- Focuses on activities in ESA's FutureEO programme that enable and prepare future ESA EO missions connected to the EO Science Strategy (exploratory studies, mission science developments, scientific analyses, modelling advances) on conceptual investigations connected to the EO Science Strategy (EOSS).
- Deliver a consistent set of case studies demonstrating how foundational scientific research, mission-science activities, and exploratory analyses contribute to scientific excellence, community growth, mission definition, and programme-level value.



A dedicated science-impact component will complement traditional socio-economic benefits, covering metrics such as publications, citations, SRL evolution, algorithmic improvements, community engagement, and uptake in international assessments.

Target budget: 500 kEuro

EGV-Pilot

The Geodetic Foundations for Future Earth Observation - Pilot Study

Activity aimed at structuring, mapping and preparing the geodetic foundations required to support future Earth Observation missions and Earth System science.

- Builds on internationally coordinated geodetic developments (definition of Essential Geodetic Variables (EGVs) within GGOS and IAG) translating these into an ESA-relevant framework aligned with the Earth Observation Science Strategy (EOSS) and future EO mission planning.
- Preparing the ground for integration into ESA's programmatic elements such as the Digital Twin Earth (DTE), while explicitly supporting activities targeted at ESA missions such as NGGM/MAGIC and GENESIS with the objective of facilitating the effective use of their data and contributing to the preparation of their final mission and data exploitation set-ups.



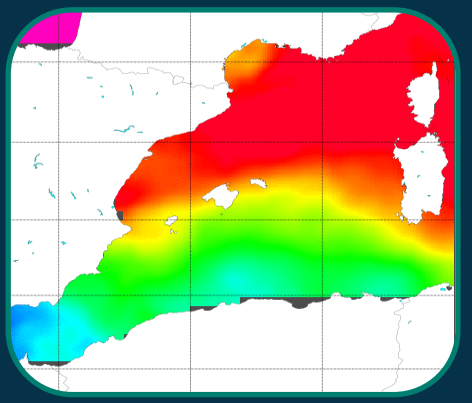
Target budget: 350 kEuro

Earth Science

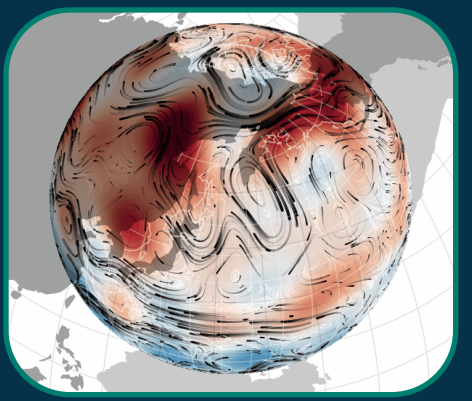
Frontier Science and Discovery: a strong foundation



Engaging the community



New methods & observation products



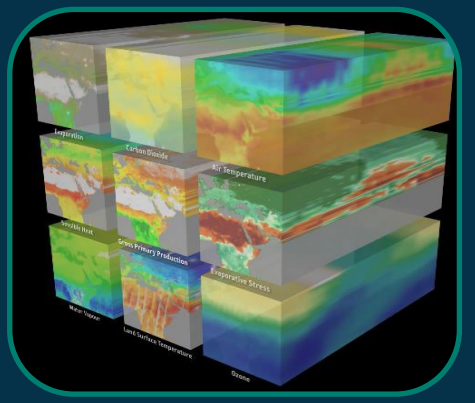
Advancing Earth System Science



Advanced simulations & predictability



STEM training and Education



Open Science Tools/Virtual Labs

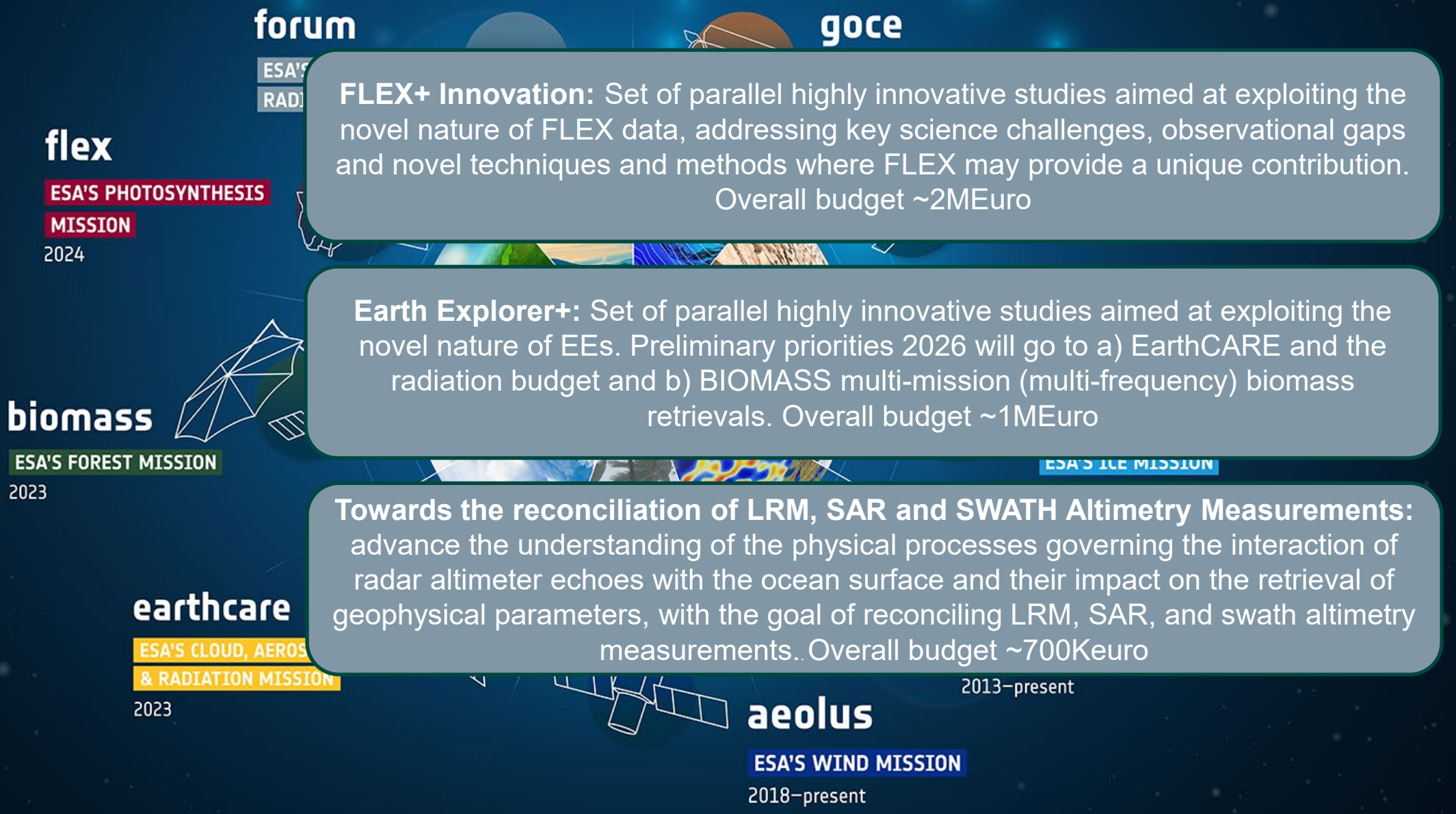


Scientific Campaigns



Transfer to future missions

Advancing EO Methods, Techniques and Products

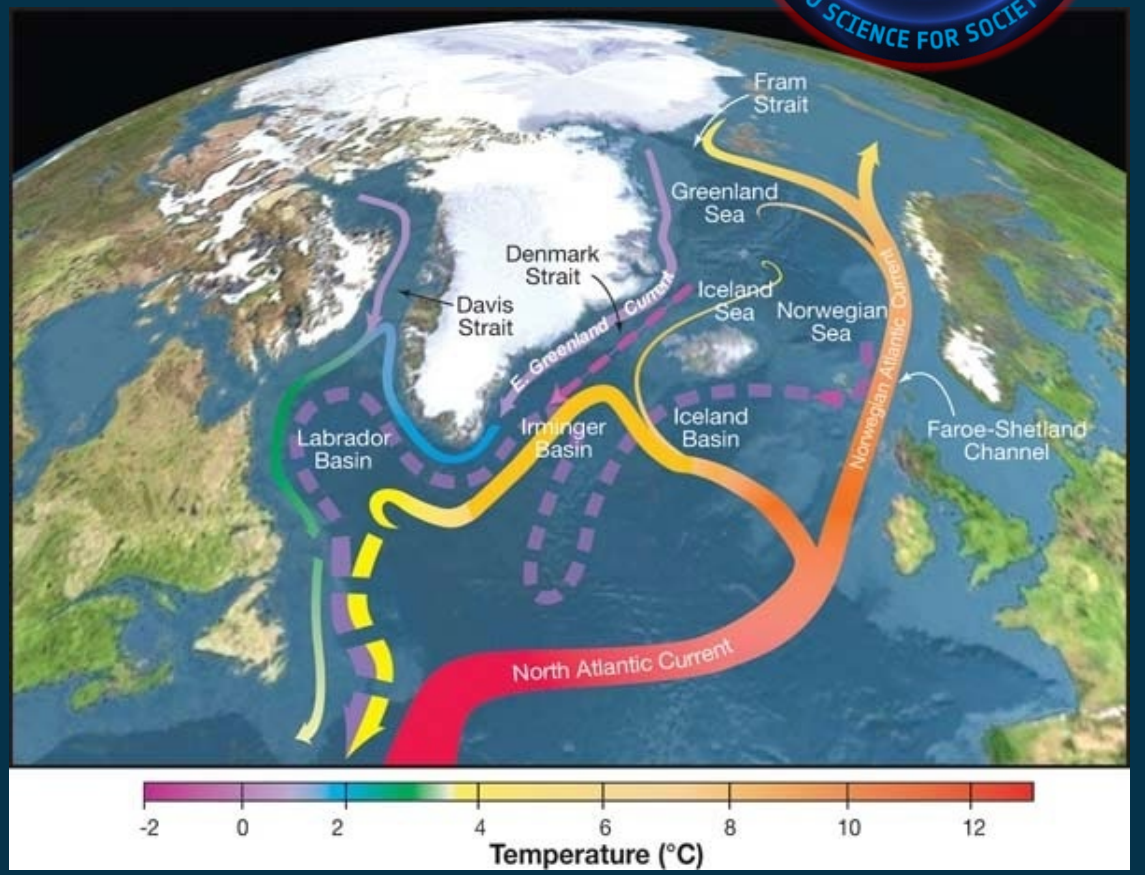


FLEX+ Innovation: Set of parallel highly innovative studies aimed at exploiting the novel nature of FLEX data, addressing key science challenges, observational gaps and novel techniques and methods where FLEX may provide a unique contribution. Overall budget ~2MEuro

Earth Explorer+: Set of parallel highly innovative studies aimed at exploiting the novel nature of EEs. Preliminary priorities 2026 will go to a) EarthCARE and the radiation budget and b) BIOMASS multi-mission (multi-frequency) biomass retrievals. Overall budget ~1MEuro

Towards the reconciliation of LRM, SAR and SWATH Altimetry Measurements: advance the understanding of the physical processes governing the interaction of radar altimeter echoes with the ocean surface and their impact on the retrieval of geophysical parameters, with the goal of reconciling LRM, SAR, and swath altimetry measurements.. Overall budget ~700Keuro

Energy Cycle - Ocean



EO4 Ocean Heat Content (OHC)

- Provide **4-D OHC** estimates at all spatial and temporal scales, with improved uncertainties, globally and in selected test areas (e.g., Arctic, SO, Med Sea).
- Improve **EEI characterization** and uncertainties
- Overall budget: ~800Keuro

Space for AMOC

- Capitalise on latest satellite technology to develop **indicators and metrics** derived from **satellite observations** (SSH, SST, SSS, ocean currents, ocean mass, etc.) to characterize key components of the AMOC.
- Estimate **AMOC variability** across s/t scales, and embody **in-situ** measurements (e.g. RAPID and OSNAP arrays), **model outputs** and **ML** techniques.
- **Discern AMOC perspectives** - persistence, slowdown or collapse?
    - Overall budget: 1MEuro

Extremes and Hazards









SimulEarth Extremes – Earth Intelligence and Multi-Hazards: Set of parallel activities advancing data-driven understanding, characterisation and prediction of extremes and multi-hazards risk and vulnerability based on novel artificial intelligence, physical-informed and hybrid modelling approaches. Priorities will be given to hydroclimatic extremes and its multi-hazards, severe storm, floods, draughts, heat waves and hurricanes/medicanes. Overall budget: ~2MEuro

Geo-hazard+: Set of parallel research projects advancing understanding, modelling and simulation of geo-hazards with focus on volcanoes, earthquakes and land slides and their multi-hazards. Priorities will be given to address major driven questions of ESA science strategy. Overall budget: 1.2MEuro.

Carbon Cycle - Terrestrial



Fire Impacts on the Earth System and Carbon Cycle – HOLOFIRE: *Advancing towards a holistic understanding of fire processes and their impacts using EO to assess what the contribution of fire to the carbon cycle is globally, and for individual fires, including: assessments of the role of wildfire in the carbon cycle, assessment of impact on air quality, black carbon, snow/ice albedo and ocean productivity, improving models and AI-based simulations incorporating fire dynamics as drivers of the carbon cycle. Overall budget: ~1MEuro*

SimulEarth Carbon - Towards a novel Data Driven Carbon Assessment: *Advancing towards a data-driven (AI-based, hybrid, physical informed AI) modular Carbon Model to simulate/predict carbon fluxes based on EO at high resolution, regionally. Maximising the use of novel EO data (BIOMASS, FLEX, Sentinels 1, 2, 3, and incoming future CO2M). Emphasis on enhanced characterisation of land surface processes, vegetation structure and functioning and land-atmosphere interactions. Overall budget: ~1MEuro*

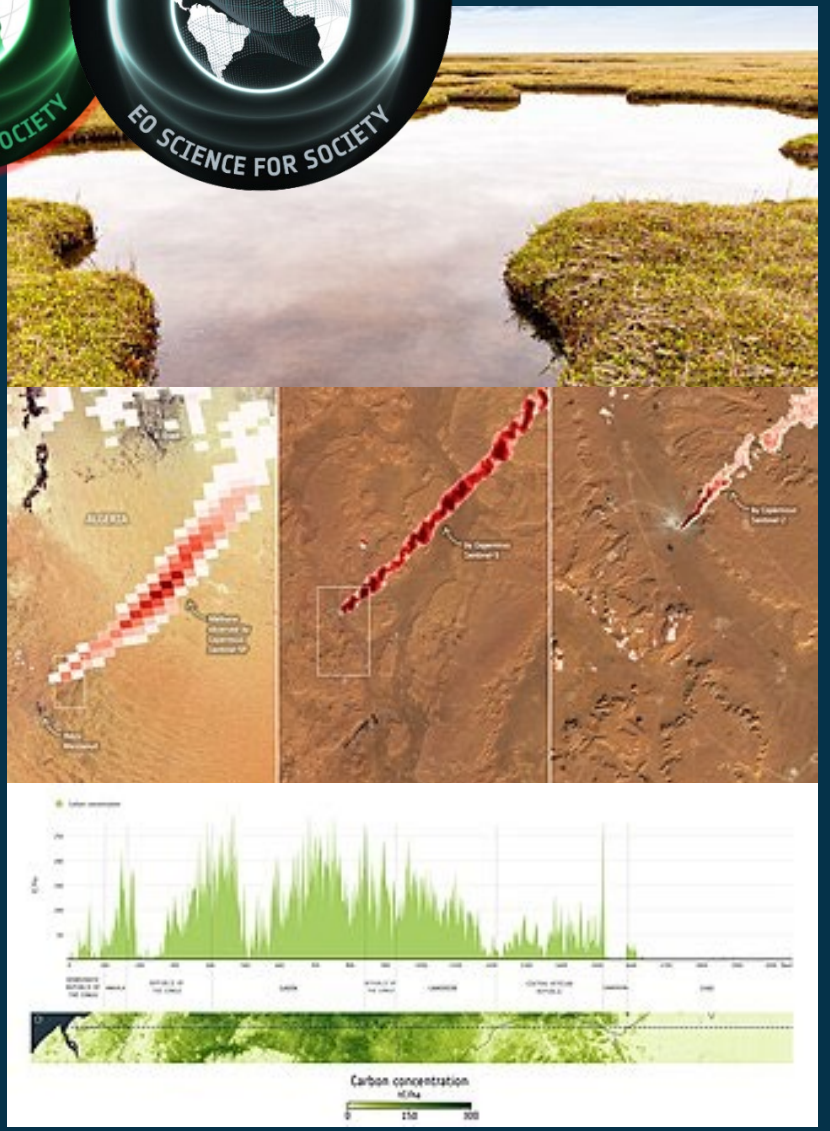
Carbon Cycle - Methane

Multi-Mission approach for regional Methane retrieval

Disentangling anthropogenic and biogenic emissions is of crucial importance for understanding the overall CH4 global budget.

- *Combination of atmospheric observations of CH4, co-emitted species (such as NO2 and CO) and land EO products (such as wetlands) to create regionally characterised methane products. Integrates area mappers and source mapper and includes use of S5, IASI-NG*
- *Developing methods for the synergistic use of modelling and observational data, and leveraging understanding from land focused high resolution optical and SAR e.g. BIOMASS to support emissions allocation*
- *Understanding both the detection and the quantification of GHGs sources and removal processes of the GHGs in the atmosphere mostly driven by the atmospheric oxidation capabilities through OH proxies for the variability in atmospheric oxidation (e.g. CO/NOx ratio, HCHO, water vapour)*

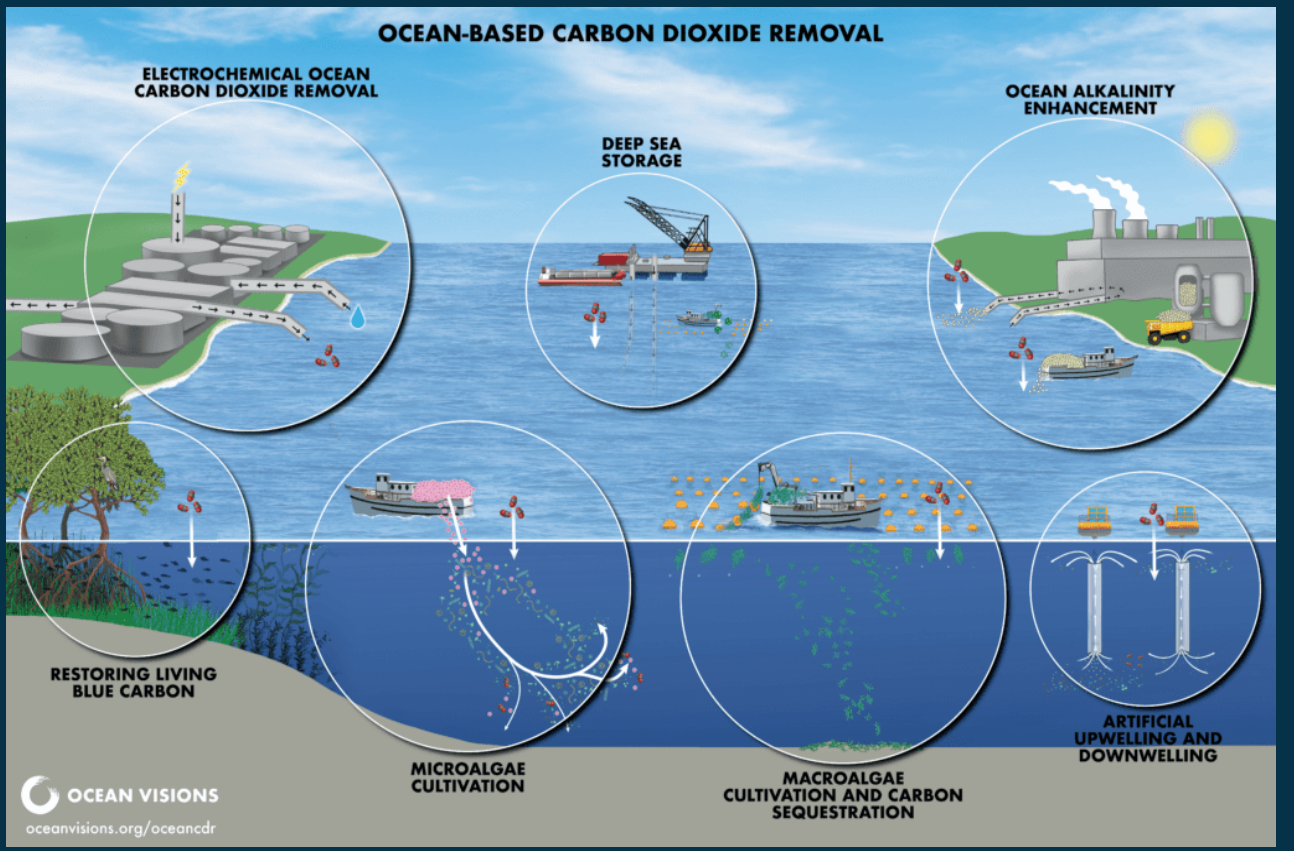
Overall budget: 1MEuro



Carbon Cycle - Ocean

Ocean Carbon Budget +: Advancing towards a novel high-resolution data-driven and comprehensive estimate of the ocean carbon budget, its pools and fluxes, including: Fine-tuning of OA and carbonate system estimates, incorporating the role of h/v advection; Advance on PFT/PSD, phenology, Addressing non-CO2 gas fluxes.
Overall budget: ~1MEuro

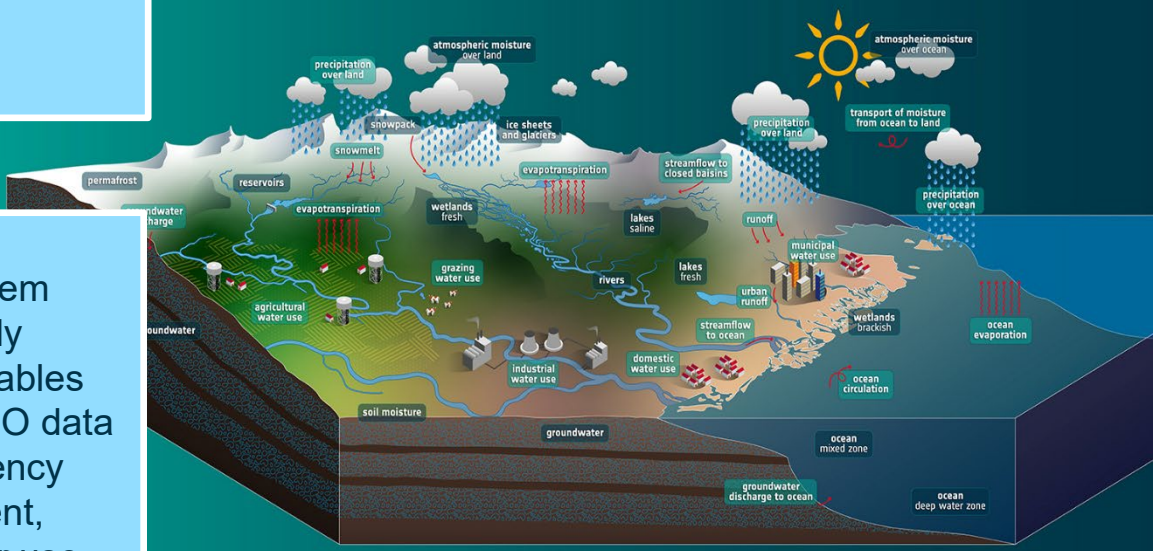
EO4mCDR – marine Carbon Dioxide Removal: Exploring novel methodologies and understand how EO can help to monitor, inspect, document and verify mCDR techniques (eg, iron fertilization, ocean alkalinity enhancement, micro/macro-algae cultivation). Inspect related feasibility, efficacy and risk/benefits.
Overall budget: ~500KEuro



Water Cycle & Hydrology

Towards a global assessment of anthropogenic impacts on the water cycle: advancing the understanding of how human activities alter the terrestrial water cycle by exploiting the full diversity of EO data to quantify and attribute changes in surface and groundwater storage, as well as water fluxes, and to evaluate the sustainability of observed trends at High resolutions. Key processes processes includes dams and reservoirs, land-cover change, water abstraction, irrigation, and other infrastructure interact to influence water availability, storage dynamics, and the partitioning of precipitation into evapotranspiration, runoff, and recharge in natural ecosystems.
Overall budget: 1Million Euro

SimulEarth Hydrology - Data driven Hyper-Resolution Hydrology: Advancing towards a novel data-driven (AI based, hybrid, physically informed) modelling system capable of reconstructing, simulating and predicting the hydrological cycle by jointly estimating a coherent, consistent, and uncertainty-aware suite of hydrological variables at a targeted spatial resolution of 1 km. The system shall be based on advanced EO data (low- and high-level products), rigorous uncertainty propagation, ensuring consistency across precipitation, evapotranspiration, soil moisture, runoff, snow water equivalent, water-body storage changes, groundwater variations, discharge, and human water use. The system and data shall be open to the community.
Overall budget: 1Million Euro



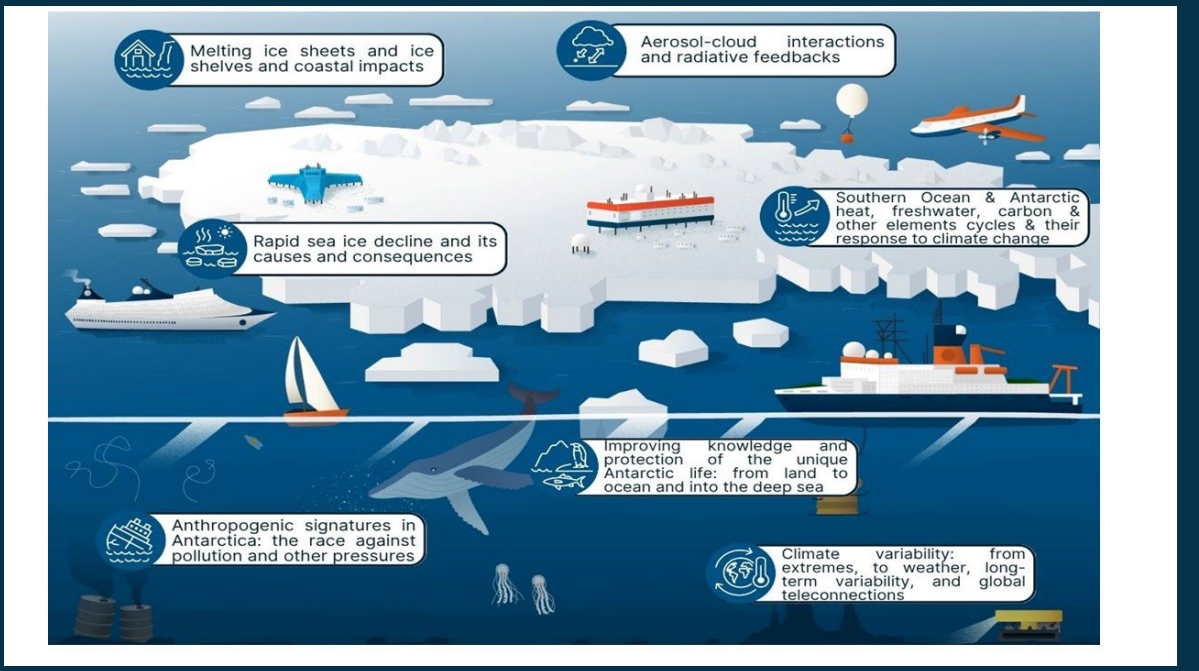
Coupling - Polar regions in the Earth system

Antarctica InSync is a programme of the UN Decade of Ocean Science for Sustainable Development (2021-2030), also known as the “Ocean Decade.” Aims to advance the understanding of Antarctica’s dynamic role within the coupled Earth system through internationally synchronised, multi-platform observations across atmospheric, oceanic, cryospheric, and biological domains.

ANTARCTICA INSYNC

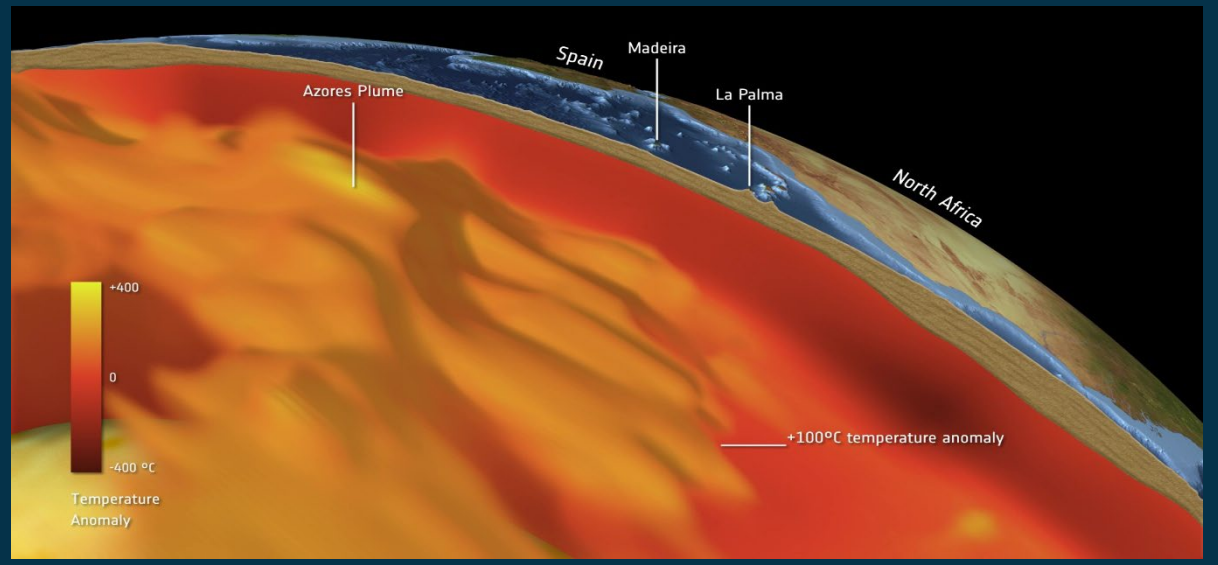
ESA Science Contribution to Antarctica InSync

Set of advanced collaborative research projects addressing the key research questions identified during preparatory phase and community white papers (https://scar.org/scar-news/insync-white-papers), projects shall aim to undertake science investigations to fully utilizing EO datasets and collaborating with modelling and in-situ campaigns planned in Antarctic Insync to improve process understanding and characterise change in Antarctica and SO maximising the impact of EO data.



Overall budget: ~2.5Million Euro

Coupling - Solid and Magnetic Earth



4D Dynamic Earth +: Enhance observation, understanding and characterisation of solid Earth dynamic processes ranging from rapid events such as earthquakes to slow, large-scale motions in the mantle and explore its impact on future potential societal applications, like earthquake hazard assessment, natural resource exploration, and predicting sea-level change. This project tackles these challenges by developing and extending modeling frameworks that integrate data from multiple sources—seismic, gravity, electromagnetic, and satellite observations—to form a coherent picture of Earth's interior.

Overall budget: ~1MEuro



4D Ionosphere initiative. This activity is built upon the results of existing 4D Ionosphere projects. With this activity ESA aims at maximasing the use of SWARM data for enhancing the understanding, modelling and simulations of the ionosphere, its process and interactions with the Earth system with special focus on small scale structures, both during quiet and active times. These should be characterised by both ionospheric but also magnetic contributions and in terms, for example, of collision frequency, ion composition, etc.

Overall Budget : ~1MEuro

Biodiversity and Terrestrial Ecosystems, Agriculture





Energy, water and nutrients cycles in agricultural fields:: Linking the energy cycle, the water cycle and nutrient cycles (including carbon and nitrogen cycles). Focus on VHR evapotranspiration, precipitation, photosynthesis, water and nutrients content in soil and crop, management practices, run-off, and water quality (and eutrophication) in impacted rivers (in-situ measurements) and lakes/coastal areas. Advance retrievals of carbon and nitrogen content in soil and crop at field scale. Include soil quality in particular in terms of toxicity. (Use of FLEX data.). Overall budget ~1mEuro

Towards monitoring heterogeneous agroecosystems: Advanced methodological developments for complex scene assessment (smallholder systems, mixed cropping, agroforestry, fragmented landscapes). Including biodiversity monitoring in agricultural landscapes. Multi-sensor approaches (including VHR, hyperspectral). Overall budget: ~500KEuro

Interdisciplinary Assessment of Biodiversity Change. Enhanced EO-based quantification and understanding of the impacts of the main direct drivers of biodiversity changes on terrestrial and freshwater ecosystems (i.e. land use changes, pollutions, climate change, invasive alien species and exploitation of natural resources). Tis includes enhancing understanding of ecosystem functioning, prediction of their trajectories (e.g., elaboration of scientifically-sound scenarios of future changes in biodiversity for key terrestrial and freshwater ecosystems), assessment of integrity and resilience of natural ecosystems to extremes. Overall Budget: ~1MEuro

Atmosphere Cluster 2026 Activities

Advancing Air Quality Assessment with a multi-scalar multi mission approach

Preliminary Objectives

- **Develop a novel Synergistics framework** exploiting joining S4, S5, S5P, IASI-NG, IRS instruments.
- **Advancement** of key trace gas products e.g. O3, NO2x, NH3, AOD, PM2.5, PM10, VOCs;
- Advancing on synergistic products between **diverse data sources such as atmospheric and land products, e.g. NOx and** fire radiative power.
- Enhancing modelling of **regional transport of pollutants** by means of synergistic hourly S4 observations, high resolution observations and in situ data to improve the source apportionment and chemical transport models.

- Overall budget: 1MEuro



STEM Education, Living Planet Fellowship, MOOCs, Advanced Training



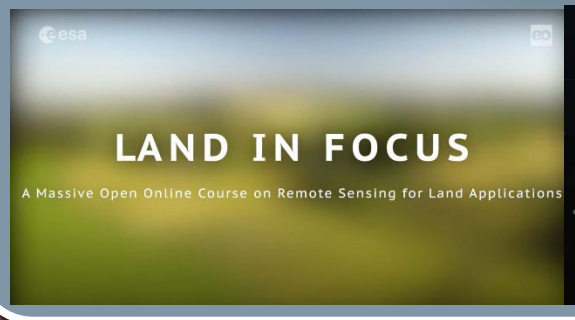




Advanced Courses Organised every year

Living Planet Fellowship Calls every year











Massive Online Open Courses

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Climate Science

ESA Climate Change Initiative

Linking satellite observations and modelling communities

CMIP Coupled Model Intercomparison Project

Advancing climate science

Developing satellite-derived climate data records





Crucial lines of evidence for informed decision-making

Supporting the Paris Agreement and Global Stocktake

Exchanging knowledge

ESA Climate Change Initiative

Linking satellite observations and modelling communities

Interfacing Obs./Model

WCRP CORDEX

CMIP Coupled Model Intercomparison Project

Advancing climate science

Cross-ECVs

Developing satellite-derived climate data records

CDRS from 1-KM AVHRR

Additional ECVs



CLIMATE CHANGE INITIATIVE

Crucial lines of evidence for informed decision-making

Tipping Elements

Biodiversity

Cities

Health

Adaptation

SRM

Supporting the Paris Agreement and Global Stocktake

Campaigns

Exchanging knowledge

Climate Activities under Earth Action:
Evolution of the Essential Climate Variables (ECV) framework - *Rational*



Evolution of requirements of major drivers in the international climate network:

- **The Global Climate Observing System** (GCOS) is reviewing and updating the ECV definitions
- **IPCC 7th assessment report** cycle started in 2024 takes into account recommendations made in terms of gaps and evolving requirements from previous report
- Support the **UNFCCC** Global Goal on Adaptation “indicators” enabling countries to track progress towards adaptation measures
- Strengthen the link between the climate observation and **modelling communities** (e.g., WCRP CMIP & CORDEX IPOs)
- Support the needs of the **operational climate services** (C3S, CAMS, CMEMS, CGLS, EUMETSAT and national climate services)

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Climate Activities under Earth Action: Evolution of the Essential Climate Variables (ECV) framework - *Objective*

Thematic area	ECVs covered (Projects)
Land and biosphere	▪ Above-ground Biomass Carbon Stocks & Change ▪ Soil Moisture ▪ Land Cover, Land Cover Change & Vegetation ▪ Fire ▪ Lakes & River Discharge
Cryosphere	▪ Ice Sheets ▪ Snow & Glaciers ▪ Permafrost ▪ Sea Ice
Ocean and coastal areas	▪ Sea Level & Sea State (including SLBC) ▪ Sea Surface Salinity ▪ Ocean Colour & Productivity ▪ Ocean-Air Carbon Fluxes & Ocean carbon storage
Atmosphere	▪ Clouds, Aerosols, Radiation budget ▪ Ozone, Water vapour, Precursors ▪ Greenhouse gases (CO_2, CH_4, N_2O, F-gases)
Cross-sphere	▪ Surface Temperatures (Land, Sea, Ice)

- Develop & validate algorithms responding to GCOS ECV requirements, QA4EO quality assessed, to generate extended multi-sensor data records
- Requirements consultation & consolidation with international scientific user communities
- Backward extension & gap-filling of ECVs, & generation of their related Climate Impact Driver indices for climate science & services
- Development of processing & reprocessing data systems for transfer to operational climate services
- Strengthen climate modelling community links (CMIP, CORDEX)
- Involvement in intercomparison or assessment initiatives
- Demonstrate ECV product value in climate science and climate service case studies

40M EUR
Tender Issue Planned: 3rd Quarter 2026
Intended Start Date: 1st January 2027
Estimated Contract Duration: 3 Years

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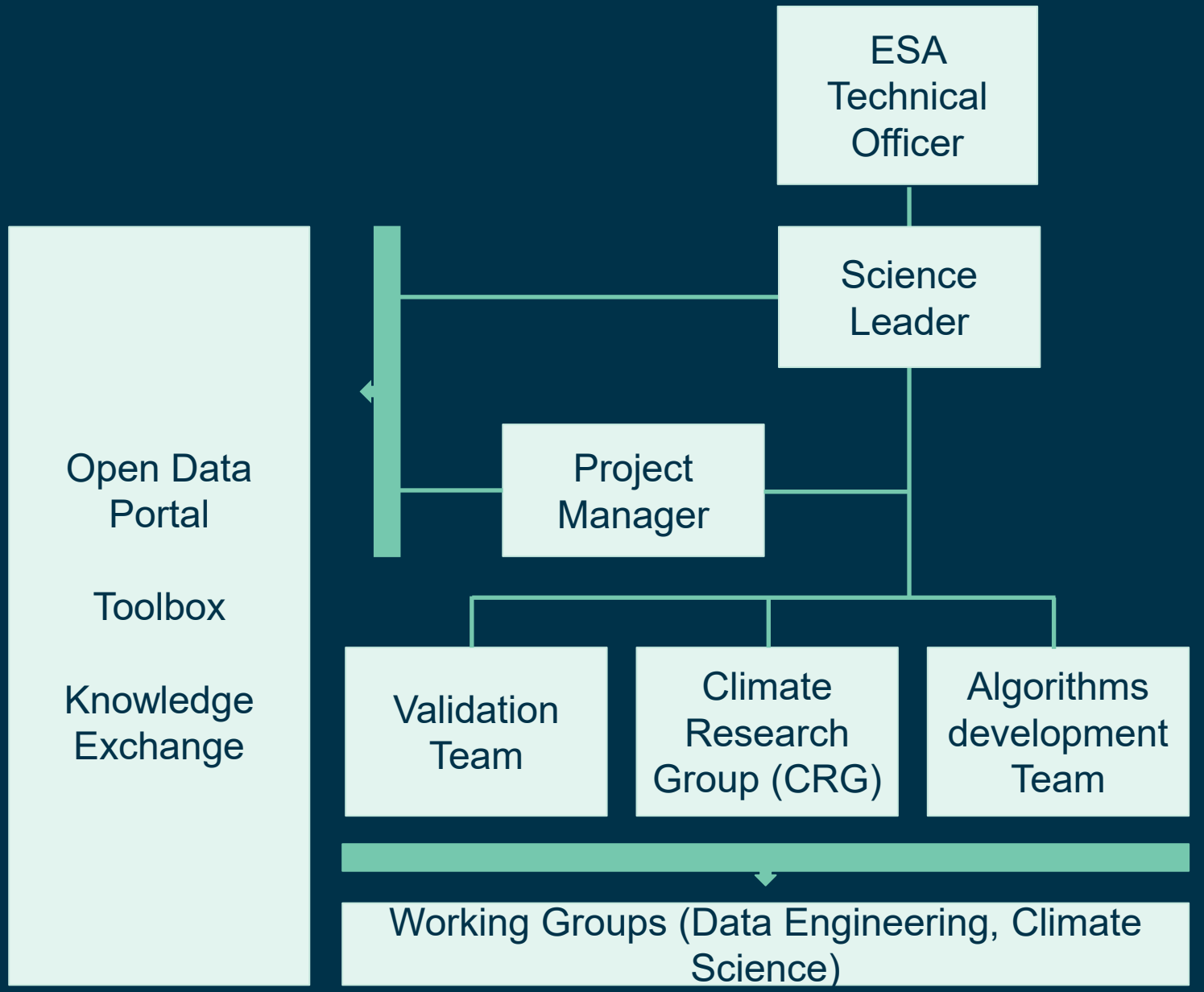

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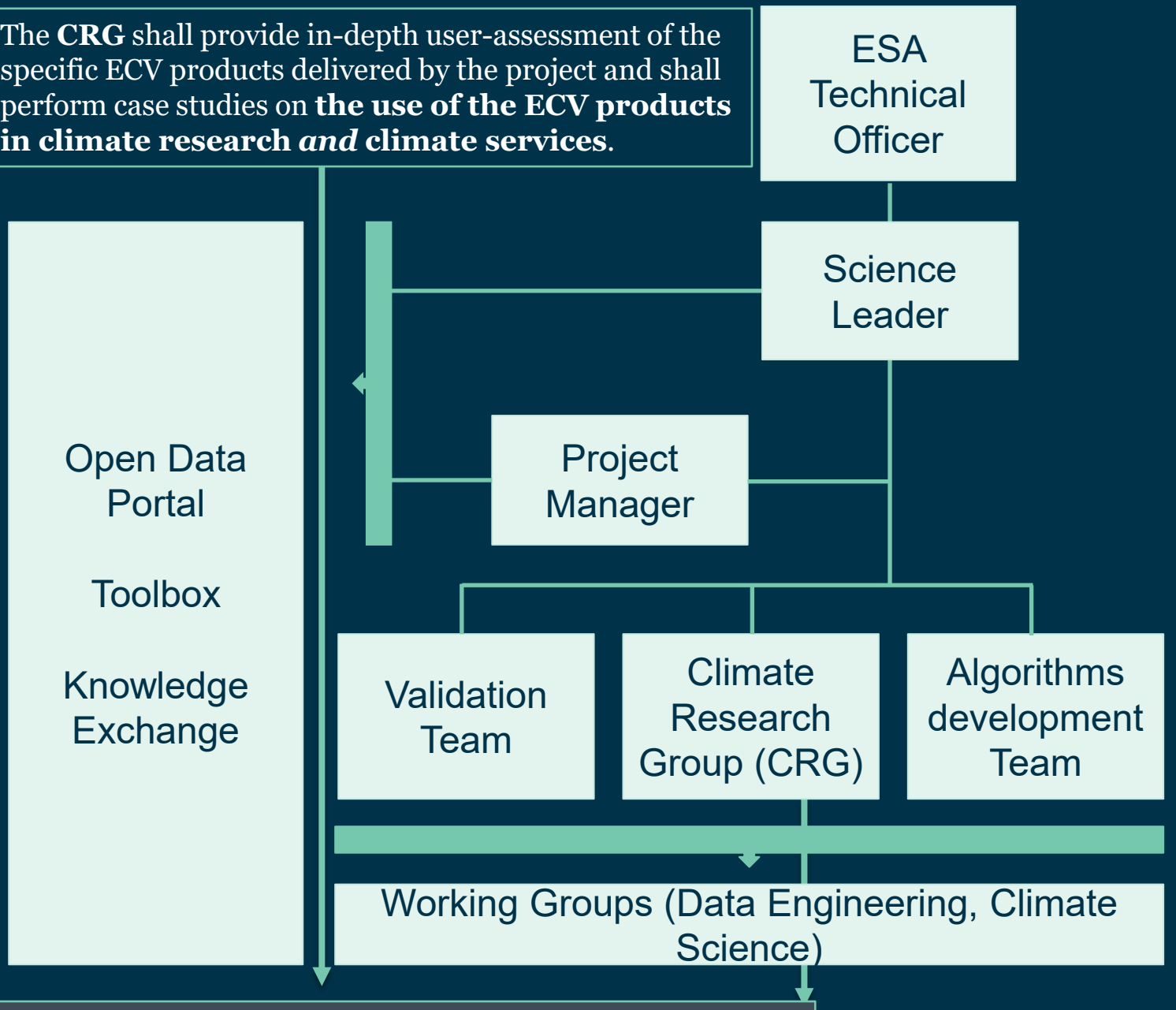
The **CRG** shall provide in-depth user-assessment of the specific ECV products delivered by the project and shall perform case studies on **the use of the ECV products in climate research *and* climate services**.



Case studies shall include the following topics: (i) interfacing observations and model, (ii) cross ECV studies, (iii) climate adaptation, (iv) feedback within the Earth system domain…

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ESA Technical Officer

Science Leader

Project Manager

Open Data Portal

Toolbox

Knowledge Exchange

Validation Team

Climate Research Group (CRG)

Algorithms development Team

Working Groups (Data Engineering, Climate Science)

Case studies shall include the following topics: (i) interfacing observations and model, (ii) cross ECV studies, (iii) climate adaptation, (iv) feedback within the Earth system domain…

Earth Action Science clusters

*Existing **ESA science clusters** on Polar Science, Carbon Science, Atmosphere Science and Ocean Science […], will be expanded to cover all aspects of the **ESA EO Science Strategy** including Water Cycle and Hydrology, Soils and Agriculture Science, Climate extremes and disasters, Solid and Magnetic Earth, Biodiversity, and the Energy Cycle and Earth Energy imbalance.*

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Special attention will be dedicated to expanding the product portfolio of EarthCARE, BIOMASS, FLEX, FORUM, ALTIUS and CO2M (all new missions expected to fly in the time frame 2026-2028), and advance multi-mission synergic capabilities across relevant ESA and non-ESA missions […]

Most recent / Future Mission

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Earth Action Science clusters

Climate Activities under Earth Action beyond 2026

- Evolution of the Essential Climate Variables (ECV) framework: 2027-2029
- Current ECV Framework activities under CLIMATE-SPACE will end Q4 2026 / Q1 2027
- Current activities under CLIMATE-SPACE (Precursor / Cross-ECVs, Tipping Elements, Support to Paris Agreement etc.) will end Q4 2027 / Q1 2028

- Projects to support **WCRP CORDEX-IPO** delivery of high-resolution regional projections key to robust **climate change impact assessment** & **adaptation**. These activities bridge the 'global & local' resolution gap & actionable information necessary for effective decisions-making across water management, urban planning & agriculture **Q2/Q3 2027**
- Prioritised **cross-ECV exploitation activities (including Tipping Elements)** to respond directly to identified community science requirements (e.g. WCRP Strategic Plan, GCOS 2028, IPCC AR6 knowledge gap analysis) & contribute directly to the IPCC assessments. **Q1/Q2 2028**
- **Precursor projects** started under CLIMATE SPACE will be *upgraded* to full ECV projects **Q4 2028**

Enabling Policies Applications


From Scientific Knowledge to Action
Evidence-based solutions to enable policies
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Applications R&D Goal

Pioneer innovative & reliable Earth Observation solutions for societal benefits, especially in support to policies on the environment, climate and sustainable development

EO Enabling International & European Policy Frameworks

UN Resolutions, Treaties & Int. Conventions

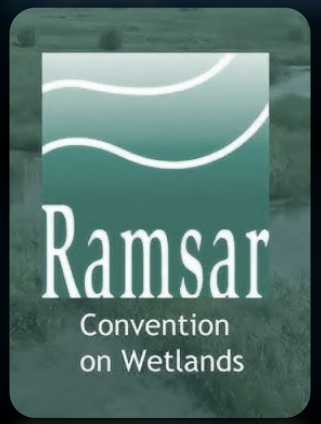




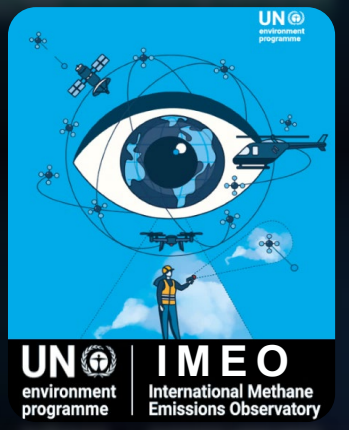












European Regulations, Directive and Strategies

















Projects' key characteristic

The active involvement

of stakeholders and end-users

throughout the co-design, development and validation phases,
to **facilitate the integration** of the developed innovative solutions
into their operational systems and practices.

Project series categories



World-series

Engine-series

PEOPLE-series (Pioneer EO apPLications for Earth action)

Early Adopters — Champion Users

– Integration readiness by stakeholders and end-users +

The role of Applied R&D

ESA disruptive research, investments for de-risking, early industrial capacity development.

ESA **Earth Science** results in synergy with DG RTD: **Earth System Science Initiative.**

Essential Climate Variables and **climate models**.

Digital innovation investments and enabling elements.

DestinE and DTE new capacity.

Applied EO R&D in all domains

from prototypes to pre-operations solutions

with active end-users' involvement

following FAIR principles.

Mainstreaming support with stakeholders and user-groups (institutional and industrial partners).

Scalable acceleration mechanisms.

ESA **Commercialization initiatives** & programmes.

Coordination with **EARSC**.

Coordination with **National Delegations**.

Specific End-user groups engagement.

Coordination with **KCEO** and **Copernicus Services** for operational implementation.
Possible inputs for **EUSPA**, **EIB/EIF** and Cassini initiative, and Copernicus user Uptake efforts.
Collaboration with **INTPA**, Global Gateway.
Collaboration with other European entities for downstream services.

Overall procurements overview for 2026

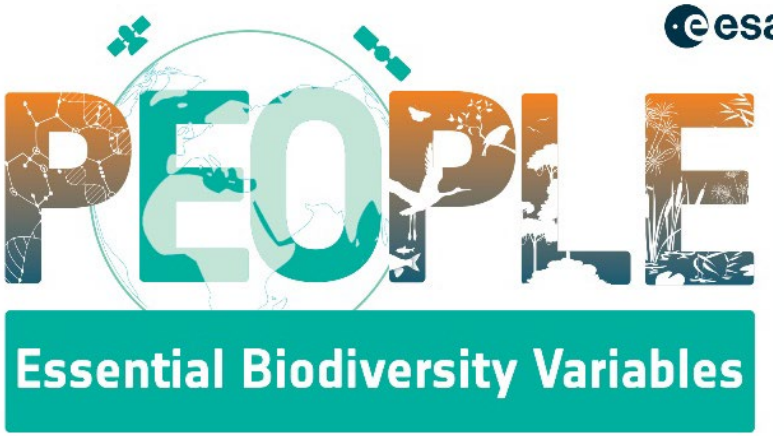
- ✓ Planned procurements (N.B.: each with multiple R&D subjects and respective separate contracts) on:
  - Essential Biodiversity Variables for the KM-GBF indicators , (already published)
  - Adaptive Forest Management , Q2
  - Sustainable and Adaptive Agriculture Solutions , Q2
  - Urban Development, Liveability and Adaptation , Q2
  - Sustainable Water Resources and Wetland Ecosystems Management , Q2
  - Advancing Sectorial Atmospheric Emissions monitoring , Q2
  - Sustainable Mineral Mapping and Extraction , Q2
  - Soil health parameter and sustainable soil management , Q4
  - Regional Air Quality Monitoring , Q4
  - Pollution Attribution: Coastal Eutrophication and Marine Pollution , Q4

Essential Biodiversity Variables for the KM-GBF indicators

- ✓ Single procurement with single contract :
  - ❑ This activity is designed to directly support Parties of the Convention on Biological Diversity (CBD) by developing Earth Observation (EO)-integrated workflows for the development of key Essential Biodiversity Variables (EBVs) and their transformation into selected indicators of the Global Biodiversity Framework's (GBF) monitoring framework.

    https://esastar-publication-ext.sso.esa.int/ESATenderActions/details/155631

    Close date: 20/05/2026 13:00 CET



Duration: 24 months.
Budget ~ 1.2 ME.

Sustainable and Adaptive Agriculture Solutions

- ✓ Single procurement with 4 separate contracts on:
  - ❑ **Crop Yield Estimation and Forecasting at a Parcel Level**: pioneers novel indicators for in-season anomaly detection and agricultural risk. PEOPLE type. 800 kE. 24 months.
  - ❑ **Next-Generation Thermal Products for Crop Health**: advances high-resolution thermal EO methods for crop water stress and evapotranspiration. PEOPLE type. 800k E. 48 months.
  - ❑ **WorldCultivate**: delivers a global, policy-ready EO capability linking cultivation strategies to planetary boundary pressures; World type. 1.8 ME. 36 months.
  - ❑ **WorldIrrigation**: provides a validated, global solution for monitoring irrigation occurrence, water consumption, and water-use efficiency. World type. 1.8 ME. 36 months.

Urban Development, Liveability and Adaptation

- ✓ Single procurement with 3 separate contracts on:
  - ❑ **World Informal Settlements**. World type. 1.2 ME. 36 months.
    will develop a harmonised regional to global EO-integrated methodology to map, characterise and monitor spatio-temporal evolution of informal settlements, providing robust and comparable indicators, while allowing flexibility and context-specific adaptations.
  - ❑ **Urban Liveability and Adaptation Planning**. PEOPLE type. 1.2 ME. 36 months.
    will develop EO-integrated methodology to generate flexible liveability assessment maps and indicators by integrating data on land use, built-up density, urban form, and key climatic, environmental, such as heat, air quality, vegetation, natural hazards, water management, to inform and provide decision support for adaptation measures;
  - ❑ **Urban Sustainable Mobility**. PEOPLE type. 500 kE. 24 months.
    will develop EO-integrated methodology to perform mobility patterns and modal split analysis and derive statistics on the allocation and usage of urban public space across mobility purposes, in support of urban sustainable mobility plans.

Sustainable Water Resources and Wetland Ecosystems Management

- ✓ Single procurement with 4 separate contracts to develop scalable EO-based solutions to:
  - ❑ **River Connectivity.** World type. 1 ME. 30 months.

    Monitor river connectivity and flow alterations, quantify impacts on river hydrology and aquatic ecosystems, and identify restoration opportunities.
  - ❑ **Inland Water Pollution**. World type. 1 ME. 30 months.

    Detection-attribution framework to monitor freshwater quality and link water pollution to the sources and drivers of pollution across rivers and lakes.
  - ❑ **Drought Risk Monitoring**. World type. 1 ME. 30 months.

    Drought risk monitoring framework to detect, characterise, and track drought conditions across river basins, supporting climate-resilient water management.
  - ❑ **Essential Wetland Variables for Wetland Condition**. World type. 1.8 ME. 30 months.

    Essential Wetland Variables (EWW) framework to assess wetland condition and support conservation and restoration efforts.

Advancing Sectorial Atmospheric Emissions monitoring

✓ Single procurement with up to 4 separate contracts. PEOPLE type. 800 kE each. 24 months.

- **Fixed Call for Proposal (i.e., specific topic proposed by bidder)**, with following objectives:
  - Advance greenhouse gases and air pollutants emissions monitoring
  - Target sectors as defined in international and European policies (IPCC Guidelines for National Greenhouse Gas Inventories, EU-ETS, CBAM, main sectors contributing to methane emissions, Industrial Emissions Portal Regulation, …)
  - Develop complementary sector-specific information such as activity data to produce EO-based policy-relevant information.

Adaptive Forest Management (AFM)

- ✓ Single procurement with 2 separate contracts on:
  - ❑ **AFM Resilience**. PEOPLE type. 1.8 ME. 36 months.

    AFM Resilience is dedicated to advancing our understanding of forest resilience, pioneering EO methods to map indicators that show the capacity of forest ecosystems to withstand, adapt, and reorganize following gradual climatic changes and abrupt disturbances. It targets the policy frameworks of the EU, supporting them with pioneering approaches for the estimation and mapping of current and future resilience of Europe's forests.

  - ❑ **AFM Regrowth**. World type. 1 ME. 24 months.

    AFM Regrowth focuses specifically on the monitoring and quantification of forest regrowth, building on current research advances to support improved understanding of forest recovery dynamics across globally selected sites, and their contribution to being effective carbon sinks. It targets both policies of the EU and international/national frameworks, monitoring and analysing the post-disturbance, natural, or post-restoration trajectories of forests across globally selected sites.

Sustainable Mineral Resources Management

- ✓ Single procurement with 3 separate contracts on:
  - ❑ **Acid mine drainage detection to provide early warnings**. PEOPLE type. 800 kE . 24 months.
  - ❑ **Ecosystem stress monitoring and restoration efforts in connection with mining activities along the full lifecycle**. PEOPLE type. 800 kE . 24 months.
  - ❑ **Detection and mapping of critical minerals**. PEOPLE type. 800 kE . 24 months.

Soil health parameter and sustainable soil management

- ✓ Single procurement with 2 separate contracts. PEOPLE type. 800 kE each. 24 months.

  - ❑ **Fixed Call for Proposal (i.e., specific topic proposed by bidder)**, with following objectives:
    - Development robust, scalable Earth Observation methodologies for large-scale estimation of chemical, physical, and biological soil health parameters, including soil organic carbon, nutrient status, pH, soil moisture, texture, and plant cover, with reduced reliance on in-situ measurements. The approach shall reduce dependence on in-situ measurements and supports the identification and improvement of sustainable soil management practices in the context of the European Soil Monitoring Law and other equivalent national policies.

Regional Air Quality Monitoring

- ✓ Single procurement with 2 separate contracts. PEOPLE type. 1 M€ each. 30 months
  - ❑ **Fixed Call for Proposal (i.e., specific topic proposed by bidder)**, with following objectives:
    - Advance monitoring of Air Quality at regional level, in Europe and other geographical areas
    - Targets the implementation of international (WHO Guidelines on Air Quality) and European (Ambient Air Quality Directive, National Emission reduction Commitments Directive) policies
    - Engages with local/regional/national Air Quality Managers
    - Leverages on the wealth of new atmospheric missions such as S-4, S-5, IASI-NG, …
    - Foresees strong link with existing initiatives such as CAMS and FAIRMODE

Pollution Attribution: Coastal and Marine Pollution

- ✓ Single procurement with single contract. PEOPLE type. 1 ME . 24 months.
  - ❑ **Coastal and Marine Pollution:**
    - **Coastal water pollution:** Development of a detection-attribution modelling framework integrating EO data and ancillary information to identify and analyse the drivers of water quality variability in coastal waters. Key points:
      - monitoring and modelling of key indicators of coastal water quality, including eutrophication, surface water temperature anomalies, changes in turbidity, harmful algal blooms, and other pollution indicators affecting coastal water quality
      - establishing linkages between observed water quality patterns and pollution sources (e.g., agricultural runoff, wastewater discharges, industrial activities)
    - **Marine pollution:** Use of EO data to develop new products, indicators and tools in support of marine pollution policies (e.g WFD, MSFD, EU Zero Pollution Action Plan), with a focus on ship-based pollution (detection and monitoring of pollutants released by ships)

StatEO - EO for official statistics reporting

5-7 May 2026 , ESRIN (Frascati, Italy)

https://stateo26.esa.int/ **REGISTRATION is OPEN !**

The event will facilitate the integration EO into national statistics processes and policy reporting, addressing how EO data can enhance the accuracy, timeliness, and spatial granularity of key metrics. The aim is to accelerate the way EO can effectively enable the policy implementation and the simplification of transversal reporting.

OECD BETTER POLICIES FOR BETTER LIVES · Alliance Bioversity & CIAT · CGIAR · UN environment programme WCMC · Food and Agriculture Organization of the United Nations · European Commission · UNECE · EARSC European Association of Remote Sensing Companies · Leibniz Universität Hannover · European Environment Agency

Upcoming: Emissions Monitoring from Space Conference

Venue: ESA–ESRIN, Frascati (Roma, IT) – 26-30 Oct 2026

Organisers: ESA, EEA, CAMS, EC

Format: Plenary sessions, breakout groups, project meetings, posters, …

Purpose:
- Bring together the EO community and key stakeholders working on GHG and air-pollution emissions monitoring.
- Facilitate a strong Science-to-Policy dialogue with European policymakers.

Focus Areas:
- State-of-the-art EO-based emission estimation for multiple use cases.
- EO data and solutions supporting policy implementation—from R&D to operations.
- Updates on relevant EU policies and building a shared emissions terminology.
- Special emphasis on **national GHG and air pollutants inventories** and how EO-based inversions can support verification and QA/QC.









Abstract submission is open!

esa
EUROPEAN SPACE AGENCY

https://www.eo4soilsymposium2026.org/

2nd EO 4 Soil Symposium
ESA SYMPOSIUM ON EARTH OBSERVATION FOR SOIL PROTECTION AND RESTORATION

04–06 November 2026 | ESA–ESRIN | Frascati (Rome), Italy

First Sentinel User Preparation (SUP) Co-ordination Workshop



- The event will bring together all teams working on the many science, applications and specific advanced processing techniques.
- It will be a unique opportunity to share an update of the Copernicus Expansion and NG missions, exchange knowledge, share insights and collaboratively shape upcoming SUP activities.

Industrial strategy and competitiveness

The ESA Φ-lab – What ?

Accelerate the future of Earth Observation

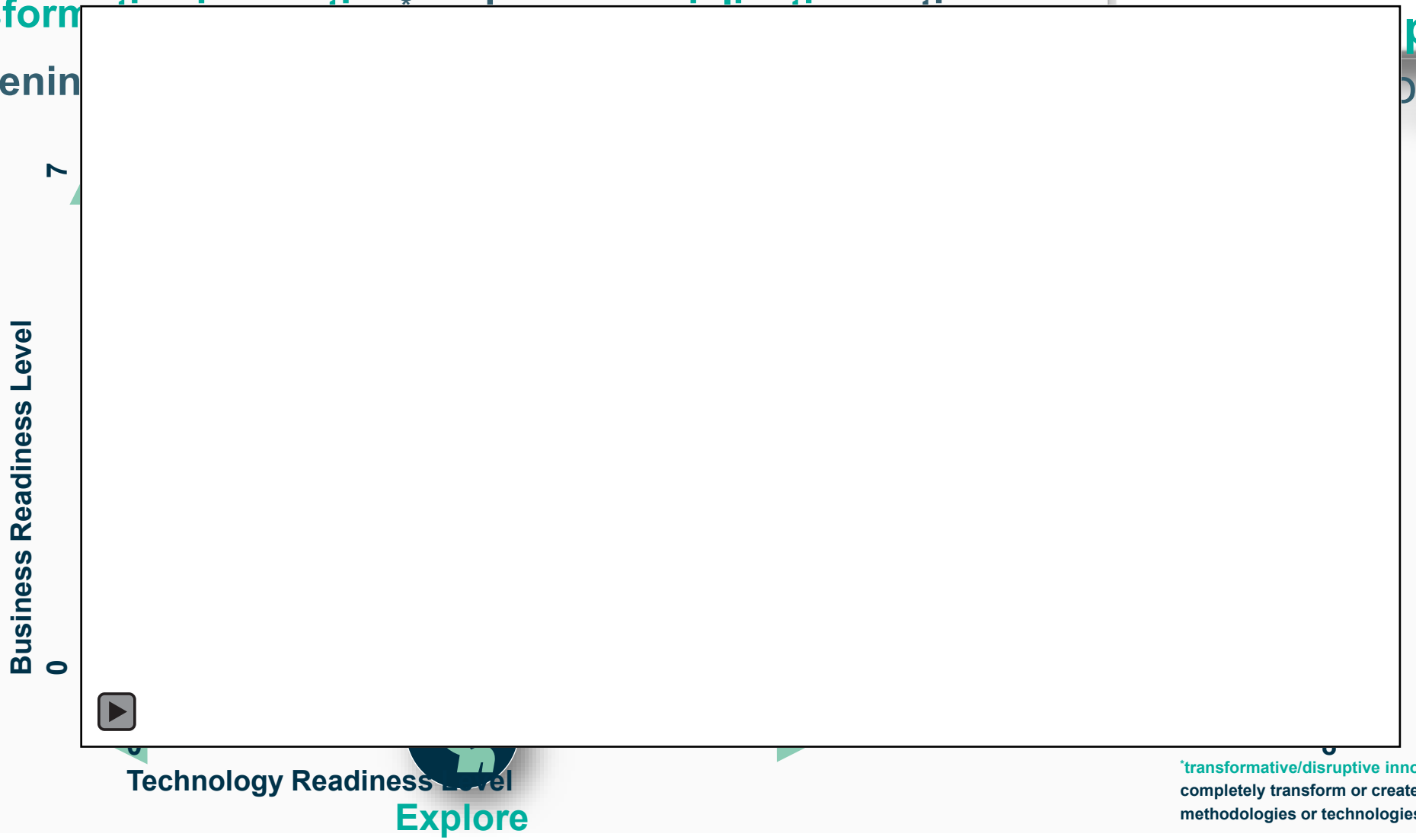
via transform

strengthenin

Uniquely in ESA Φ-lab **innovate and**

ply

one-roof



*transformative/disruptive innovation: with the ability to completely transform or create entire industries via new methodologies or technologies

The ESA Φ-lab location and people

Since 2020
210 people from 33 nationalities
have been part of the ESA Φ-lab









Some of Φ-lab successes*

21
Strategic collaborations with companies, agencies, research centres and private investors

200+
Publications on peer reviewed journals and conferences

20+
Visiting Professors

140+
Visiting researchers

16
Φ-lab contributed satellites and constellations

€355M
InCubed fund size (in 2025 e.c.)

210+
InCubed activities @62% co-funding rate

€600M
Private funding to InCubed companies (2021-25)

*The ESA Φ-lab successes: as of January 2026


esa
Φ-lab
Intuition-1
KPLabs
Φ-sat2
Open Cosmos
AIX
Planetek
Dashing Through the Stars
D-Orbit
PROGRES
Spire
HYPERFIELD
KuvaSpace
KANYINI
SMARTSAT CRC
FOREST-3
OroraTech
Wild Ride
D-Orbit
MANTIS
Open Cosmos
UKKO
ReOrbit
HIVE
Constellr
TALISMAN
SATLANTIS
FFSCAT / Φ-sat 1
DEIMOS and UPC
SEMOVIS
Marble Imaging
GLOBAL GUARDIAN
Airbus
2020
2021
2022
2023
2024
2025
2026
2027
2028
LEGEND
Fully supported by Φ-lab
Supported by Φ-lab Explore Office
Supported by InCubed Once

The ESA Φ-lab Offices



Φ-lab Explore Office

Explore the innovation universe

connecting EO sensor revolution
with the digital revolution

Team of Technology Innovators
and an innovation seed funding (FutureEO)



Φ-lab Invest Office

Stimulates competitiveness by fostering the growth of entrepreneurial initiatives through investment actions from ESA Member States and private investors

A team of business innovators and
a commercial co-funding programme (InCubed)

ESA contributions in the EO company life-cycle

esa Φ-lab

ACCESS, BASS

Data Buy
(CCM/TPM)

InCubed

Future EO
Industrial
Competitiveness

TDE / GSTP

ScaleUp INNOVATE

Business Readiness Level

> BRL 7

BRL 1

BRL 0



BUSINESS ANGEL



SEED INVESTMENTS
10 k€ – 1 M€



VENTURE CAPITAL
UP TO 10 M€



GROWTH CAPITAL
> 10 M€
PRIVATE EQUITY/LEVERAGED BUYOUT



TURN AROUNDS
> 10 M€
INSTITUTIONAL INVESTORS

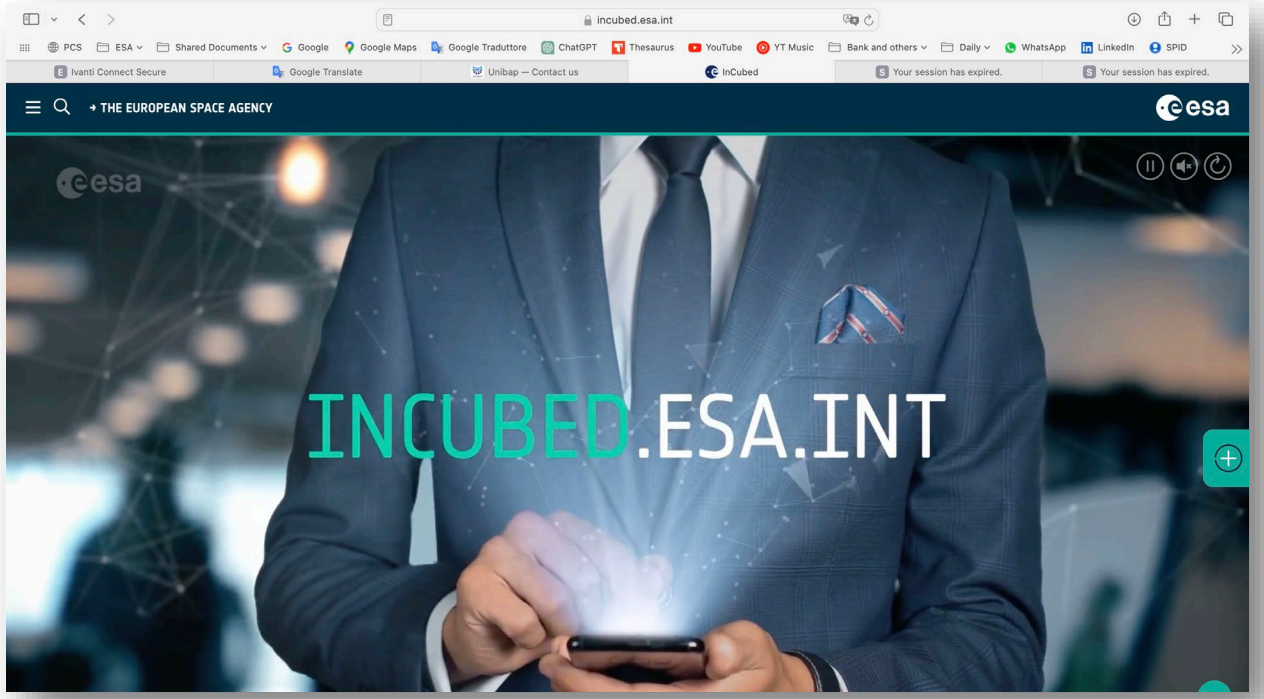
TRL 1

TRL 3

Company cash-flow

Technology Readiness Level

Φ-lab run Investing in Industrial Innovation (InCubed)



€355M
InCubed fund size
(in 2025 e.c.)

220+
Activities
@62% co-funding rate

NATIONAL DELEGATIONS
ESA
INDUSTRY

100k€ to >25m€
Project size

€600M
Private funding to InCubed companies (2020-26)

Personalised technical and commercial guidance

Zero-equity and zero-IPR

ESA stamp of credibility

Privileged access to commercial services enabling your development

Access to ESA EO facilities and Φ-lab community

Industrial strategy opportunities

- The aim of this group of activities is to **gain deeper and analytical understanding of the EO market and industry**, together with assessing specific verticals:
  - Deliver a data-driven overview of the global EO market and emerging opportunities and use this analysis to steer strategic European investments aligned with ESA roadmaps and programmes
  - Deliver targeted market and technology analyses on key EO verticals to support evidence-based decisions for new initiatives and investments
- We will procure the second edition of **EO Maker Space** to set a Prime Contractor-led mechanism delivering rapid, on-demand support to high-potential EO idea via a subcontractor network
- Finally we aim to **measure and communicate the economic, industrial, and societal impact** of commercial initiatives in **InCubed** to demonstrate return on public investment

Industrial strategy opportunities Φ-lab

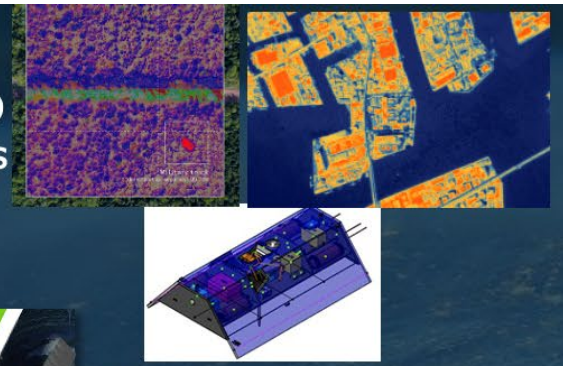
Topic	Description and Goal	Date	Value
Global EO commercial market studies	Deliver a data-driven overview of the global EO commercial market and emerging opportunities. Use this analysis to steer strategic European investments aligned with ESA roadmaps and programmes.	2027 Q1	**500**
Commercial on-demand studies on EO verticals	Deliver targeted market and technology analyses on key EO verticals to support evidence-based decisions for new initiatives and investments. In collaboration with CIC	2026 Q4	**200**
EO MakerSpace 2	The concept sets a Prime Contractor-led mechanism delivering rapid, on-demand support to high-potential EO idea via a subcontractor network	2027 Q4	**500**
InCubed Impact	Measure and communicate the economic, industrial, and societal impact of InCubed to demonstrate return on public investment.	2026 Q3	**150**

Industrial Competitiveness Main Objectives

- Consolidate advanced processing methods and analytics layers to augment European resilience capabilities
- Augment European resilience decision support systems through integration of new data sources (EO and non-EO), predictive analytics (eg ABMs, fuzzy graphs) and novel visualization approaches
- Support industrial competitiveness by exploiting innovative ideas and cutting-edge developments
- Strengthen industrial competitiveness through strategic early-stage activities to be transferred to commercially focussed funding sources
- Stimulate enhanced cooperation between EO and non-EO data providers to open up a wider range of market opportunities
- Explore market potential for EO-based information from existing and future missions and elaborate best practices in non-space industries for EO adoption.

Contributing capabilities

New EO systems



New platforms (eg HAPS, autonomous systems)





Transponders, IoT sensor networks OSINT & media data



DTs of Earth and human system processes

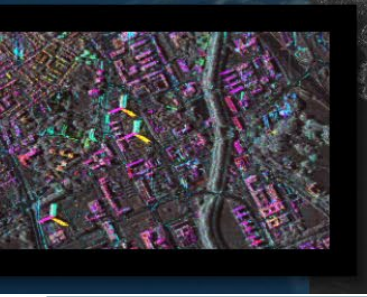




Established EO systems



Innovative processing methods

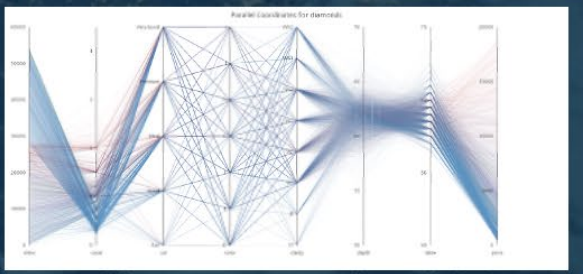




Leading edge AI

Advanced predictive capabilities (eg ABMs)





Next generation ICT (eg super-fast databases)

2026 opportunities – industrial competitiveness

Analytics Support for Industrial Operations Adaptation – ITT addressing priority sectors, 1.5M€ per contract.
2026 priorities include
- Steel
- Commercial Agriculture

EO and autonomous system integration – Fusion of local and wide area situation awareness for enhanced operations – 2 parallel contracts 500k€ per contract

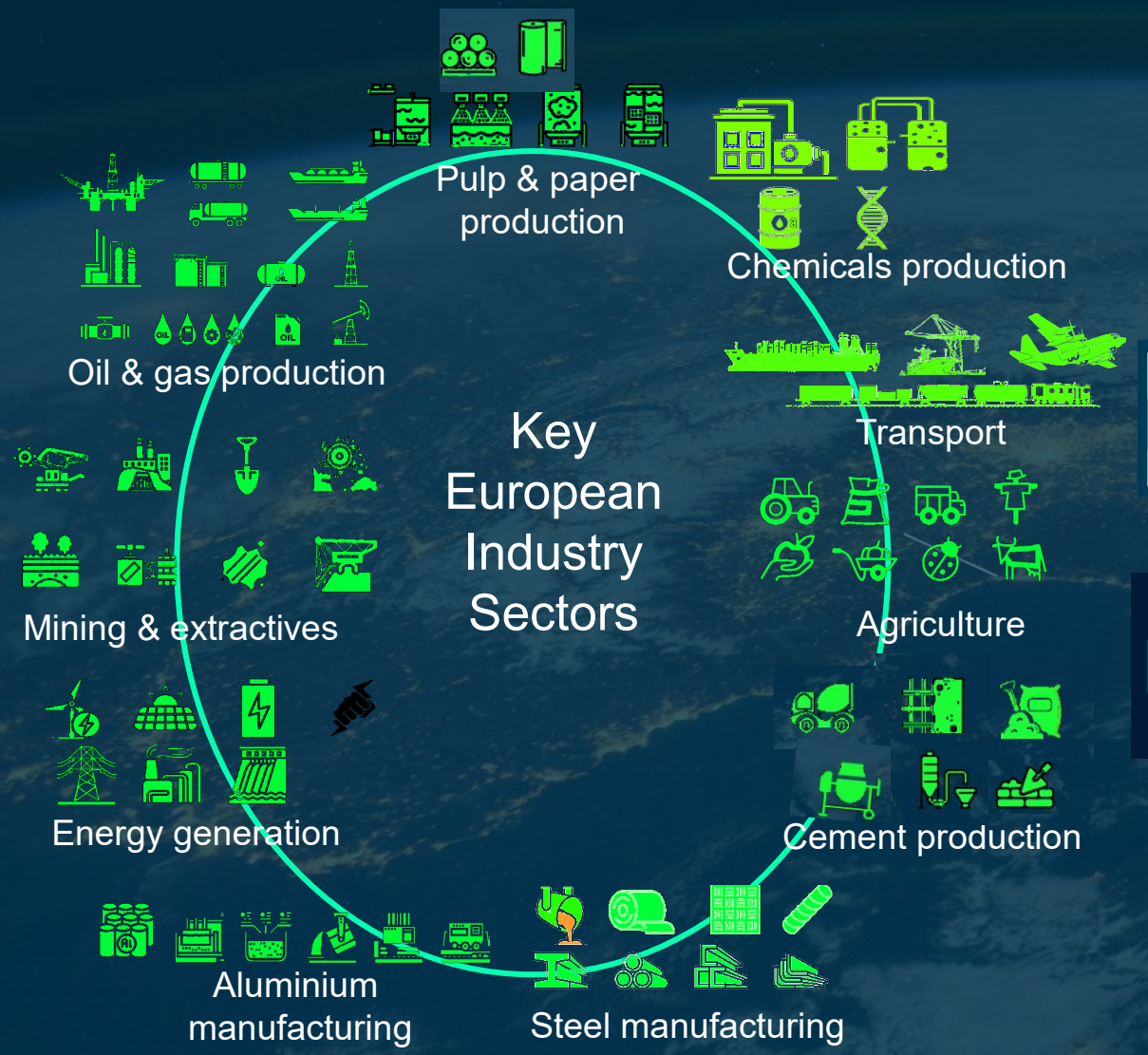
Small Satellite Fitness for Purpose demonstrators - ITT addressing TIR constellations and RF constellations, 600k€ per contract

Market Sector Best Practices – ITT addressing 2-3 market sectors, 600k€ per contract
- auditing carbon credits
- industrial safety

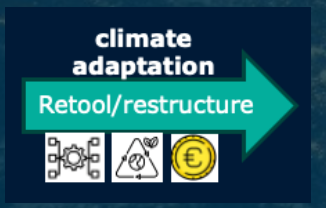
EO Veracity Test Cases – ITT addressing 3–4 service chain components, 500k€ per contract

Advanced Water Management Facility – ITT addressing central Europe, 1 contract 3M€

What are we considering for Industrial Adaptation?







Restructured traditional heavy industry

Resilient Manufacturing, production and processing

New Green Industry markets





Example issues to be addressed – Steel & Dairy Farming



New energy sources



Raw materials access

Steel production



Emissions/ pollution



Energy use



Low cost alternative protein sources



Production processes & supply chain structure under higher temp/humidity

Dairy farming



Finished product quality



Zoonotic disease exposure



Land use competition



Supply chain resilience



Harsh operations environments



Animal welfare certification

Resilience ITTs in 2026

New EO systems and methods – ITT for multiple parallel development lines, 500k€ per contract):

- SWIR IMS
- Optical shadow in off-nadir imagery
- GNN/ ABM/ fuzzy graphs for crisis process prediction
- Low light level feature characterization
- Sensor fusion for data enhancement
- SAR/RF/AIS advanced fusion for enhanced target characterization (including AIS TDOA/FDOA)
- Neuromorphic processing for VideoSAR based feature characterization/IR low contrast feature extraction
- Long wavelength SAR penetration exploitation
- ISAR/multi-static SAR/SAR MD for enhanced target characterization
- Multi-dataset integration for hybrid threat characterization

New Applications & Services Verification – ITT for multiple parallel development lines, 1.5M€ per contract)

- Regional Security Facilities (Baltic, Arctic, Eastern Med/Black Sea etc)
- Domain Focussed Facilities (Next Gen HADR, undersea infrastructure security)
- International Law Enforcement Support Facilities (crimes against humanity, drugs, terrorism/org crime, counter-proliferation etc)

Enhanced Decision Support and Visualization ITT, single contract 500k€

- Integration of EO and OSINT into investigation support tools

2026 main events





Disruptive Innovation

The ESA Φ-lab Offices



Φ-lab Explore Office

Explore the innovation universe
connecting EO sensor revolution
with the digital revolution

A Team of Technology Innovators
and an innovation seed funding (FutureEO)



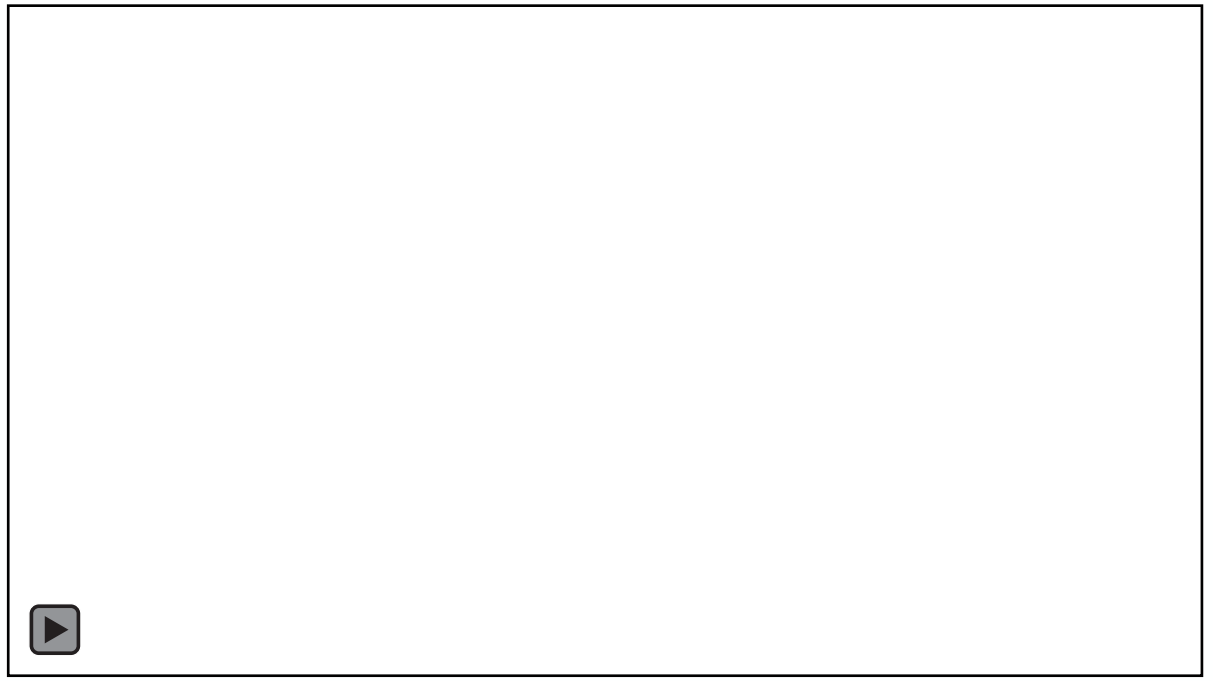
Φ-lab Invest Office

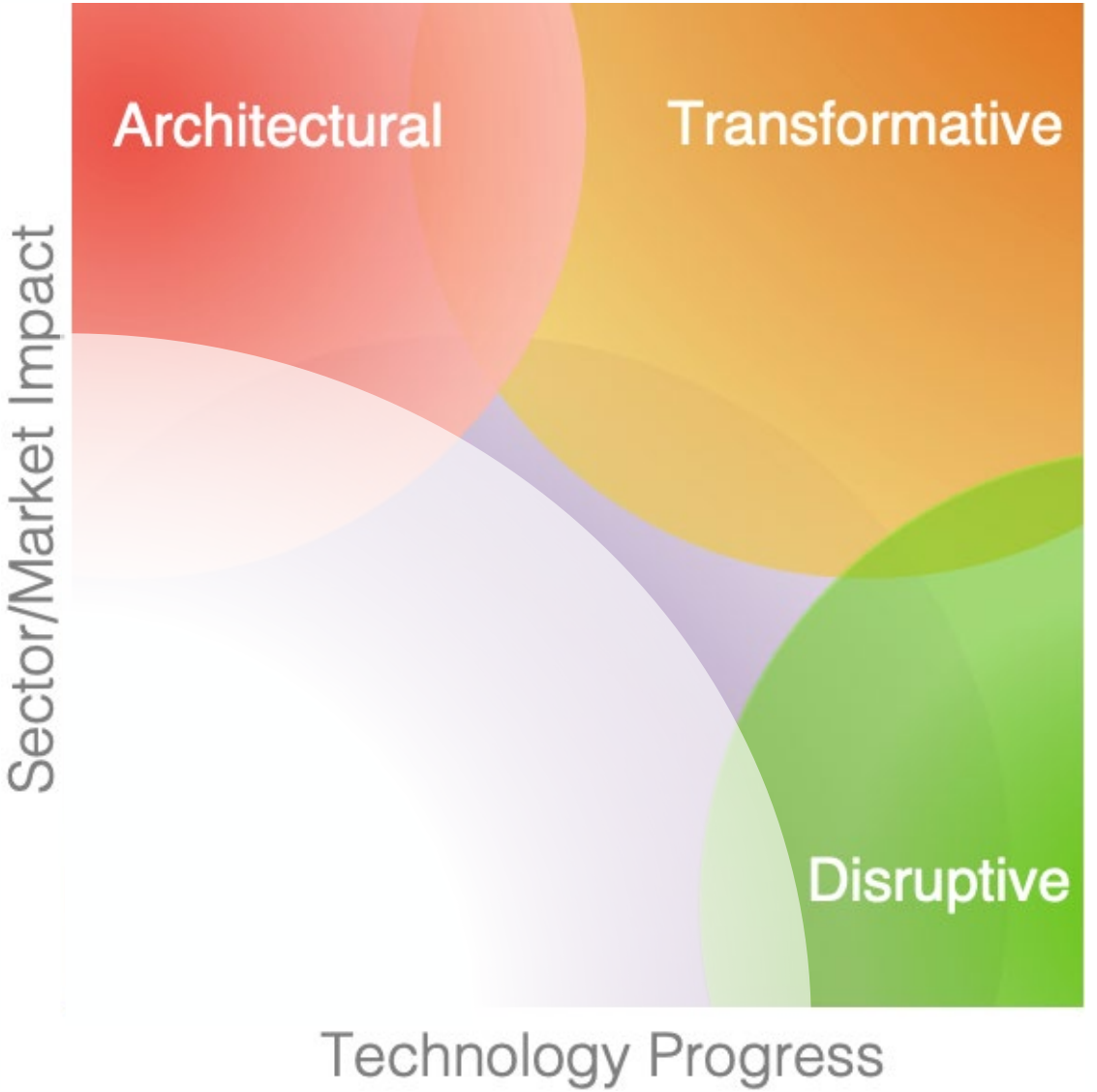
Stimulates competitiveness by fostering the growth of
entrepreneurial initiatives through investment actions
from ESA Member States and private investors

A team of business innovators and
a commercial co-funding programme (InCubed)

Innovation comes in multiple flavors

Transformative innovation delivers unique competitive advantage





Innovation Technologies axis and Applications

esa Φ-lab

AXIS I	AXIS II	AXIS III
Augmented Intelligence	Innovative Computing Paradigms	Other Transformative

Modus Operandi

Explore, Capacity Building, Impact, Uptake and Community

Open Lab, Challenges, Sprints, Hackathons

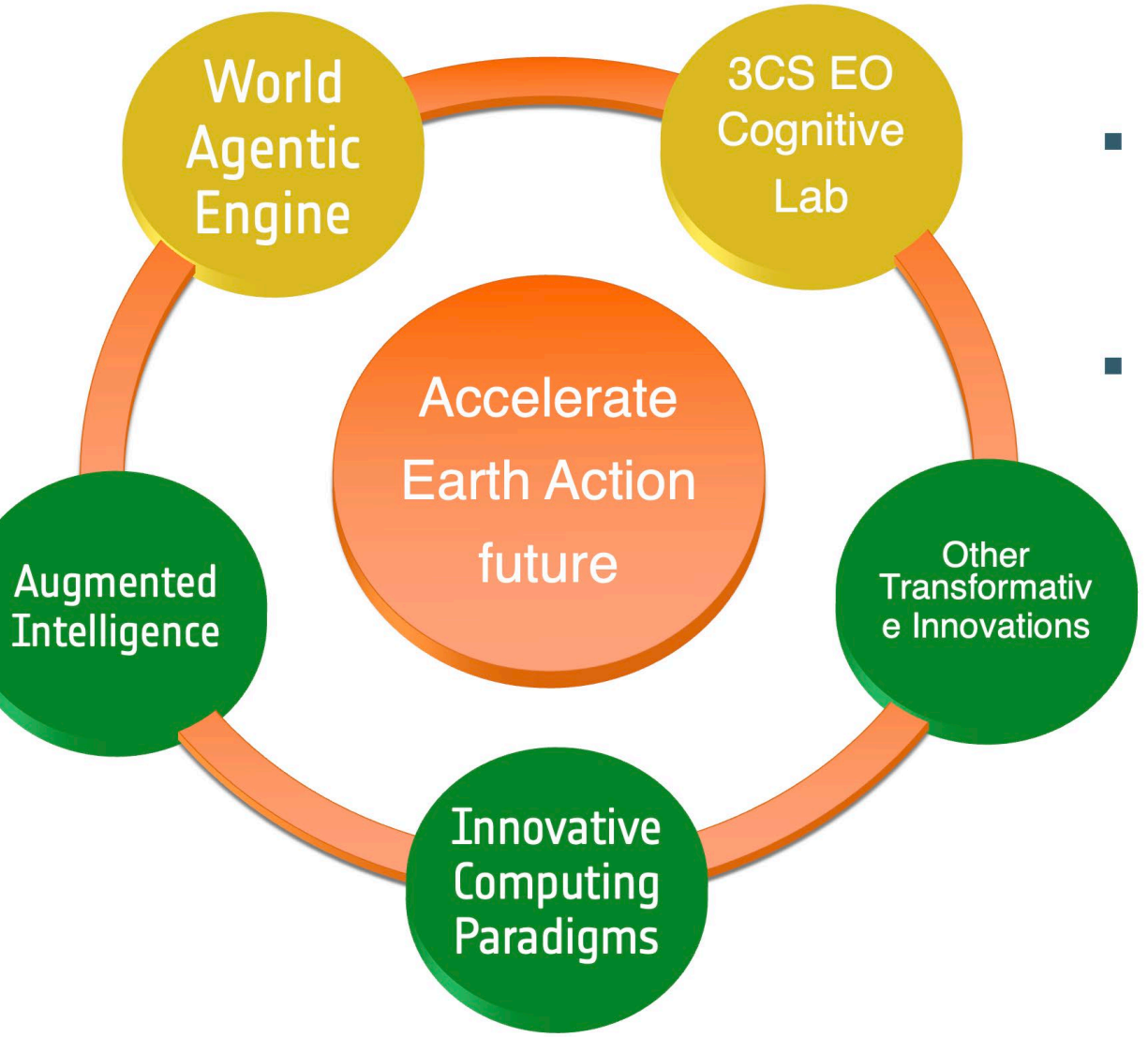




- Flight HW
- Flight SW applications
- Downstream applications
- End to end systems
- Innovative business models

and others

Research Pillars and Vision



- **Augmented Intelligence** support for societal challenge/opportunities and scientific discovery
- **Innovative Computing Paradigms** to handle the current and future EO product offerings via edge AI and QC4EO
- **Other transformative innovations** : VR & ER, IOT, Distributed Ledgers, Metamaterials and Surfaces, etc..

Convergence toward :

- **World Agentic Engine**: based on augmented and trustable datasets powered by multi-modal/scale geospatial foundation models
- **3CS EOCognitiveLab**: increase system autonomy, flexibility, reduce info latency and expand toward resilience needs and future observation models

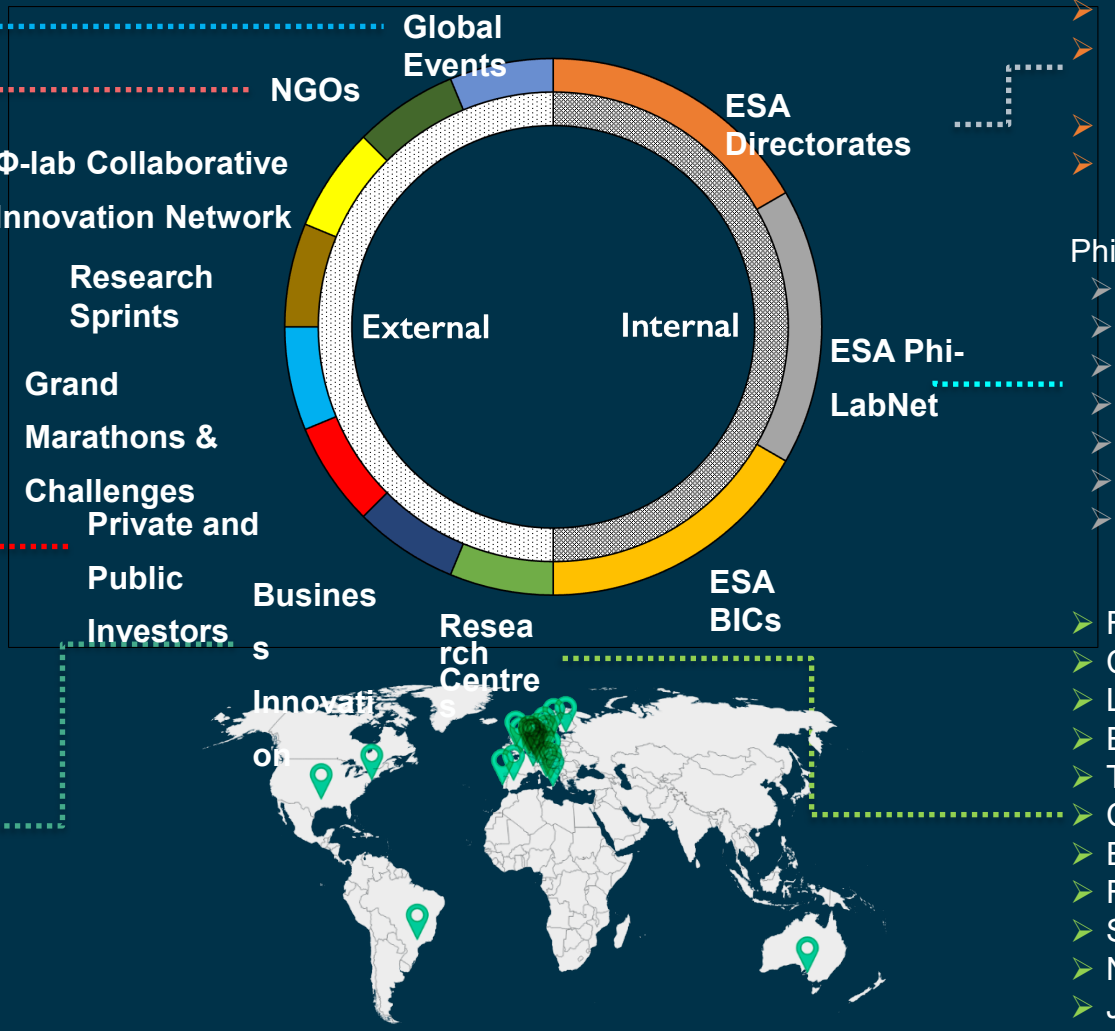
Φ-lab Global Innovation Ecosystem

Working with a global innovation network

- ESA Φ-nnovation
- ESA EO Commercialisation Forum
- ESA-NASA Foundation Model Workshop
- Hello Tomorrow Global Summit
- AI Week
- We Make Future
- Vivatech
- Web Summit
- ESA Quantum Technologies conference
- ESA Living Planet Symposium
- UNICEF
- Save The Children
- GIGA
- WFP

Seraphim; PrimoSpace; Zero; EIB; OTB

- GEOSAT
- ICEYE
- NVIDIA; ScaleWay
- Ellipsis Drive; OVHCloud
- OHB
- Planet - D
- Sinergies
- Thales Alenia Space Italy & Spain
- UP42
- ALTAIR



- ESA Earth Observation
- ESA Technology, Engineering and Quality
- ESA Commercialisation, Industry and Competitiveness
- ESA Operations
- ESA Connectivity and Secure Communications

Phi-LabNet sites

- Austria
- Finland
- Norway
- Spain
- Sweden
- The Netherland
- UK

- Frontier Development Lab
- CERN Open Lab
- Leonardo Labs
- ECMWF
- Technical University of Munich
- CAIRNE (Confederation of Laboratories for AI Research)
- ELLIS (European Laboratory for Learning and Intelligent Systems)
- Forschungszentrum Jülich
- Smart CrC
- NASA GSFC
- JPL

Collaboration opportunities at Φ-lab



Shared mutual interest

Join the Φ-lab to explore disruptive ideas

as a Visiting Researcher (industry, academia),
Visiting Professor, Research Fellow, PhD, YGT, etc.

Funded

1. Φ-lab's procurements on ESA-STARS
   - Cognitive Space, Foundation Models, Generative AI, QC4EO, Edge computing, DLT, etc..
2. InCubed : partnership development of commercial products or services
3. Open Space Innovation Platform : co-funded research or researchers
4. EO Science4Society Open Call : no SOW, 100/200K, 6/18 months
5. ESA Technology Programmes like GSTP and TDE



Disruptive Innovation opportunities

The following are the main technological directions explored in 2026

- **Cognitive Cloud Computing in Space (3CS) EOCognitiveLab** – Demonstrating advanced spacecrafts constellation autonomy, responsiveness and agility in space
- **Geospatial Foundation Models** – Advancing the development and demonstration of GFMs for downstream and upstream applications
- **Agentic AI and Decision Intelligence** – Progressing in the development and evaluation of Agentic AI for advanced data exploitation and decision Intelligence
- **AI4Climate** – Use of modern AI paradigms to support ESA Climate strategy
- **Physic-Informed Machine Learning (PIML)** to support advanced scientific modelling

Disruptive Innovation Opportunities

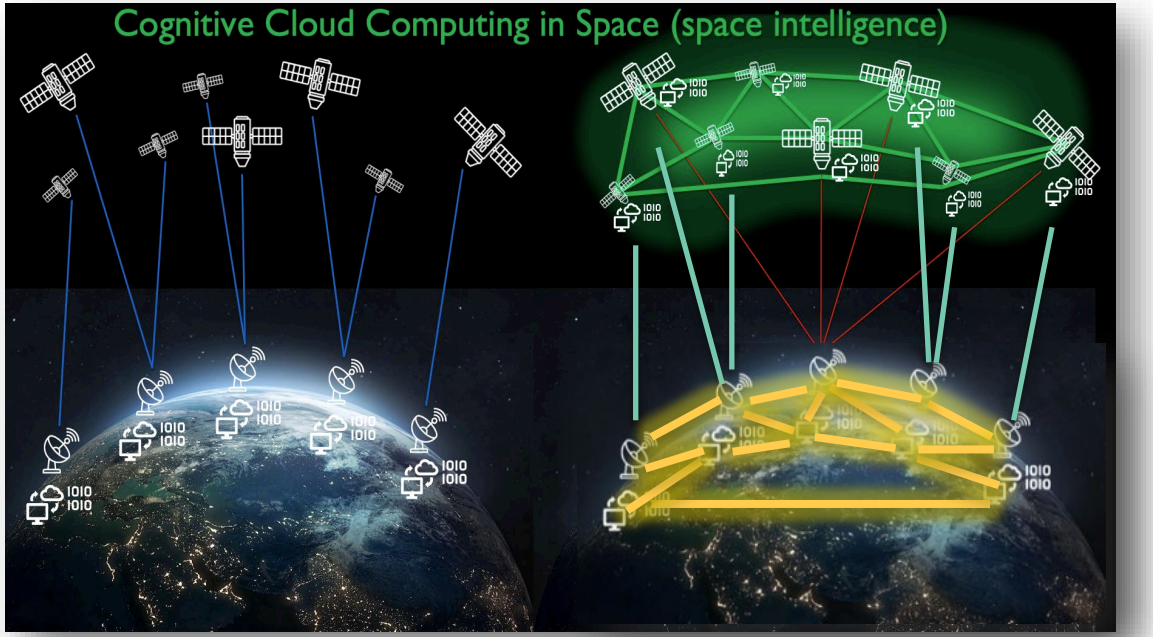
Topic	Description and Goal	Date	Value (k€)
EoCognitiveLab	Design and development of the Cognitive Cloud Computing (3CS) EOCognitiveLab mission concept based on requirements from 3CS ongoing studies	Q4 2026	TBC
Geospatial Foundation Models (GFMs) – decentralized AI	Explore the use of decentralised AI learning techniques to leverage distributed EO data sources to improve scalability, latency and security	Q4 2026	400K€
Geospatial Foundation Models (GFMs) – Embedding at scale	Investigate the current challenges in establishing a system capable of generating and retrieving analysis-ready satellite embeddings at scale	Q2 2026	400K€
Agentic AI - World Agentic Engine	Prototype development for a World Agentic Engine based on deep reasoning and specialized FMs to exploit the European EO data ecosystem	Q2 2026	3M€
Agentic AI – Decision Intelligence	Study to identify technologies and general methodology for the application of Agentic AI in Decision Intelligence	Q2 2026	250K€
Agentic AI – for economic sectors	Demonstrate the benefit of Agentic AI in elaborating and ingesting multi-source data to generate impact on different economic sectors	Q4 2026	400K€ (TBC)

Disruptive Innovation Opportunities

Topic	Description and Goal	Date	Value (k€)
AI4Climate - ECVs	Looking at exploring the potential of Generative AI to improve ECVs by filling observational gaps and by generating non observable ECVs	Q2 2026	1M€
AI4Climate – VR and NLP	Demonstrating the advantages of extended reality and modern Natural Language Processing in the presentation and understanding of complex climate data to end users	Q2 2026	600K€
Physic-Informed Machine Learning (PIML) for EO	Explore the use of new training and reasoning paradigms to allow an explicit representation of physical models in deep learning	Q2 2026	400K€

EOCognitiveLab
Disruptive Innovation

Design and development of the Cognitive Cloud Computing in Space EOCognitiveLab mission concept based on requirements from 3CS ongoing studies



What is Cognitive Cloud Computing in Space (3CS)?



Integrating mature disruptive technologies into a cohesive architecture

New 3CS-enabled applications

- Early alert systems (e.g. disaster monitoring)
- New observation models (e.g., tip & cue)
- New commercial missions (e.g. space cloud, satellite as services)

Expected date : Q4 2026

Duration : 30 Months

Budget : TBC M€

World Agentic Engine

Disruptive Innovation

- The proposed procurement aims to establish a prototype for a World Agentic Engine (WAE): an **agentic system** where **geospatial and AI models** can be **integrated**, **orchestrated**, **exploited**, and **economically rewarded** when **invoked by applications or AI agents**
- The WAE will be built around **compact semantic representations such as embeddings**, enabling efficient information exchange, and scalable agent-driven reasoning over world models
- WAE will be conceived as a **flexible, domain-agnostic ecosystem** capable of supporting a wide range of model types and use cases including environmental intelligence, climate services, socioeconomic analysis, simulation frameworks and other **domains that benefit from interoperable, agent-driven intelligence**
- The WAE will **enable agentic orchestration of services, models and data**, driven by **LLM-based reasoning** and **world models**, allowing **humans and autonomous AI systems** to dynamically compose capabilities and operate across domains using a shared semantic layer



Expected date : Q2 2026

Duration : 18 Months

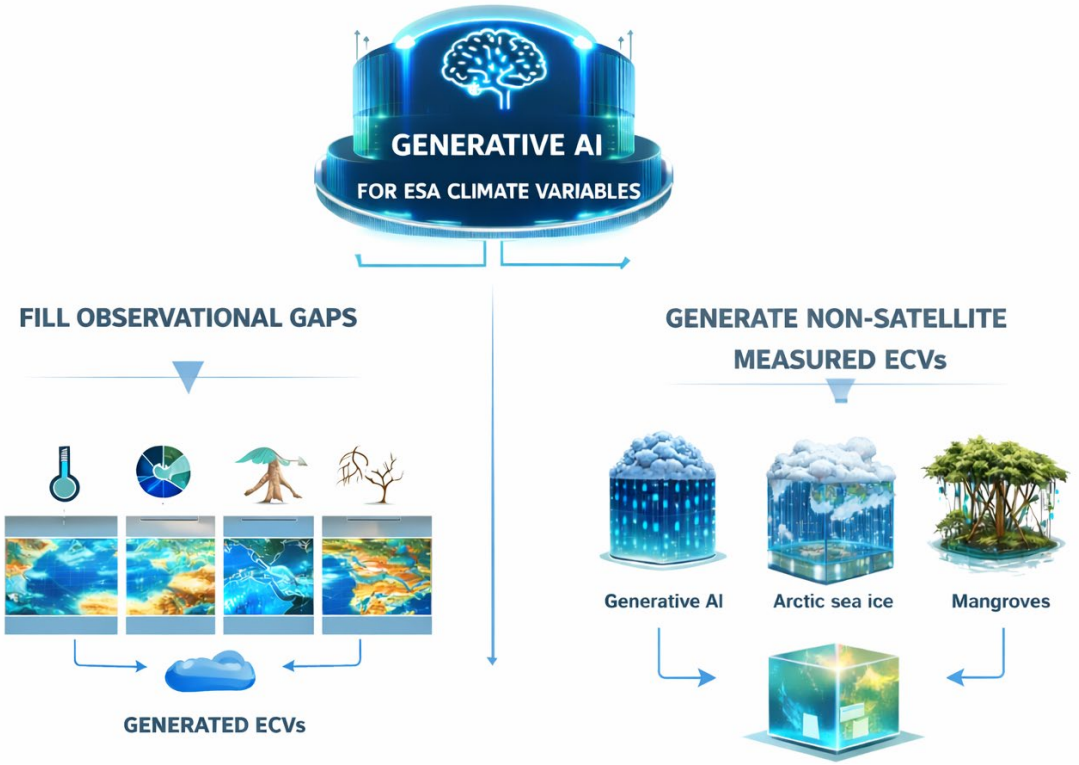
Budget : 3 M€

GenAI for ECVs enhancement and non observable ECVs

Disruptive Innovation

This activity is looking at exploring the potential of Generative AI to improve the ESA Climate Variable - ECVs along 2 independent tasks:

1. Use Generative AI to fill observational gaps and simulate missing climate data, improving the reliability and comprehensiveness of long-term datasets
2. Explore Generative FM to generate ECVs non measured by satellites



The activity also includes the establishment of benchmarking frameworks to validate and optimise AI workflows

Expected date : Q3 2026

Duration : 24 Months

Budget : 1 M€

Events 2026

- ECMWF-ESA Machine Learning Workshop 13-17 April 2026 – 250 people in presence + 700 online
- 3rd EO Commercialisation Forum, 12-14 May 2026
- 2nd ESA-NASA International Workshop on AI Foundation Model for EO – 19-22 May 2026
- AI4Space 2026 - CVPR workshop 3-4 June 2026
- Φnnovation Summit 23-25 June 2026
- Agentic AI for EO workshop 12-14 October 2026
- Collaborative activities: Challenges, Sprints, and Grand Marathons!





Digital Enablement

From Open Science to Open Innovation

Science
R&D project

Scientist
Research Institute

Application
R&D project

Research Institute
Space Value Adder

Industrialization
R&D project

Space
Value Adder

Commercialization
project

Non-Space
System Integrator



Earth Science
Community
Understanding
the Earth

EarthCode
reusable Science
R&D repository
Open Science

APEX
reusable Application
R&D repository
Open Source

Information Factor(ies)
operationally usable
Information Products
Open Innovation



Earth Action
Community
Decision Making
Monitoring

Network of Resources &
Interoperable Building Blocks
Interoperable Ecosystem for sharing, collaboration, execution and service provisioning environments

Copernicus Data Space Ecosystem +
National infrastructures

2026 opportunities – Digital Enablement (1/2)

Permanent core activity is the evolution of a federated European Network of Resources to provide enabling services to achieve the Earth action goals to the science community (as part of the EarthCode Federation) and the Value Adding Community (as part of the APEX federation). This basic layer is implemented with 2 major contractual frameworks, on for the “Network of Resources” (NoR), one for the Interoperability action.

NoR EarthCode Federation Provider Services – NoR Best Practise Call, overall volume 2-3M€ to provide operational interoperable platform services for FAIR open science, overall volume 2-3M€, e.g. Algorithm hosting, code quality engineering support, reusable workflow management, etc.

NoR APEx Federation Provider Services – NoR Best Practise Call, overall volume 2-3M€ to provide operational interoperable platform services supporting on-demand executable Earth Action Information-as-a-Service products, e.g. Algorithm hosting, Performance optimization, Algorithm Scaling, Processing-as-a-Service

Interoperability Ramp-up Support – DN to be onboarded as use case to Interoperability Frame Contract, 50-100€ per use case, overall volume 2-3M€: use EOPECA+ interoperability open-source stack to make your platform eligible for EarthCode/APEx federation; become a remunerated open-source contributor

2026 opportunities – Digital Enablement (2/2)

To further enhance the above framework of enabling services, in 2026 the following activities to create new capabilities are planned:

EarthCode Pilot: Systematic Scientific Processing Service – ITT Q3 800K€ for development of operational capability, potential follow-up 1.2M€ for operational use. Within the science clustersFAIR-ify potentially not open science processors, to routinely execute them and provide systematically renewed science products, reference analysis-ready data collections

APEx Pilot Global Value-Adding Platform Production Capacity – ITT Q4 1M€ to build operational capability, potential follow-up 1M€ for operational use. Build a capacity to systematically upscale R&D results to global level for cost-efficient annual re-production. Showcase with International Energy Agency (IEA) as stakeholder

QGIS and JupyterGIS extension – ITT Q4 900K€ to enhance QGIS open source and integration with JupyterLab to support systematic integration of Earth Action information-as-a-Service products (available in APEx and plugged into Information Factories) into the QGIS ecosystem

Knowledge exchange and capacity building

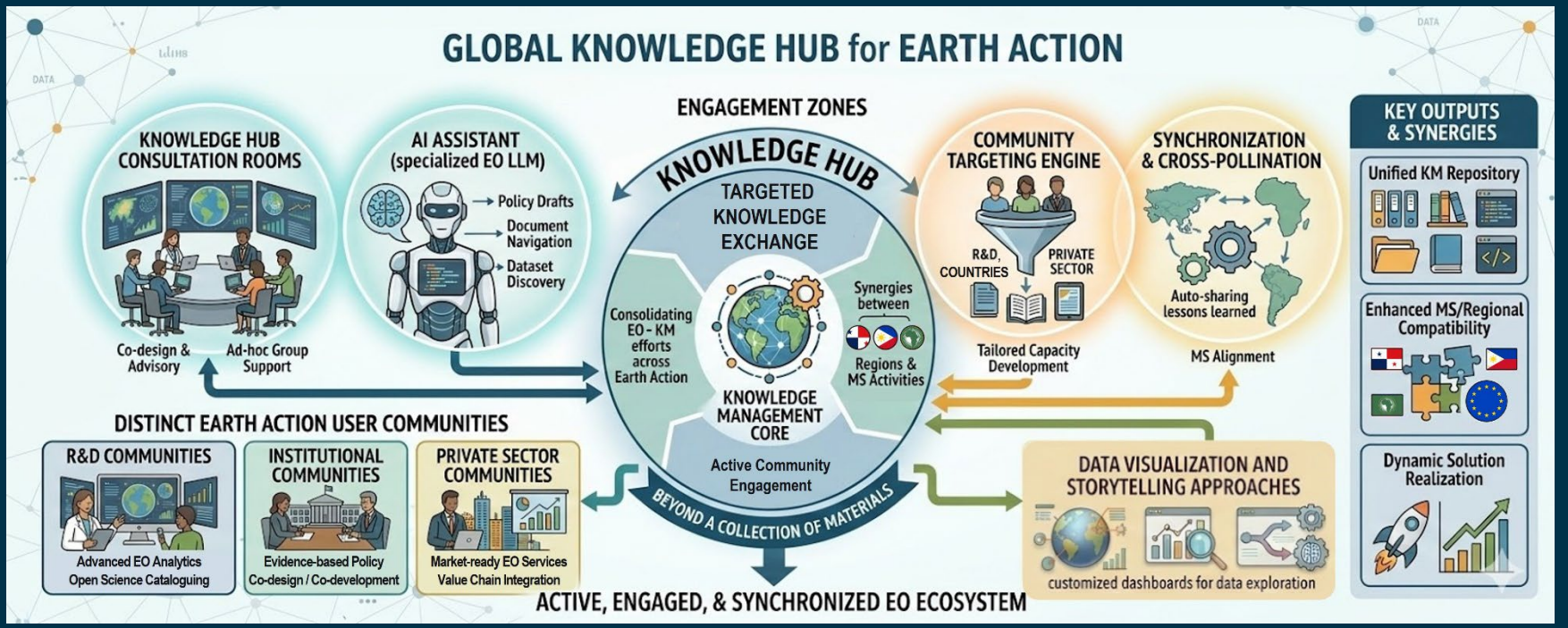
Knowledge exchange and capacity building

Empowerment path and uptake of solutions



Action Readiness Elements & Planned Activities 2026

- **EO Knowledge & Skill Transfer**
  - through continental capacity development programs in Africa (EO AFRICA), Asia & LAC
  - 3 regional Capacity development facilities for Africa, Asia and LAC – each 4Meuro, ITT Q3-4 2026
  - Earth Action integrated Knowledge Management & Exchange
  - Global Knowledge Hub – 5 Meuro, ITT Q2/3 2026



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Action Readiness Planned Activities 2026

Capacity building 2026

Open Science Promotion & Competence Building

ITT 300K€ for setup and initial year, follow-up 600K€ for 2-year follow-up:

Promote open science strategy and train the next generation of scientists on the available tools and demonstrate benefit of reusable open science via early adopters

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Partners and cooperation

Action Readiness for Global Cooperation

Building on ESA R&D, Science, Missions

- Strategic Guidance & Advocacy
- Technical Assistance for EO Uptake
- Global EO Public Goods
- EO Knowledge & Skill Transfer

Enables **Earth Action** through **Partnerships**

Regional & National Partners



Mandated National Stakeholders

47+ M€

Multilateral Partners

Global Gateway

World Bank, ADB
IADB, IFAD, EBRD
INTPA
GCF, GEF, LDF, IMF, UNDP

GDA

Alignment & Scaling through partnerships

70 M$

Action Readiness Elements & Planned Activities 2026

- **Strategic guidance & advocacy**
  - co-design with key partners the integration of EO in their programing & planning
  - Strategic Advocacy Facility - strategic consultancy & integrated support, scope 5-10 partners
  - 6Meuro, ITT Q2/3 2026
- **Technical Assistance for EO Uptake**
  - integrate EO in operations of partners at national to regional scale
  - Technical Assistance frame contract - pool of EO experts, scope 10 partners
  - 10Meuro, ITT Q4 2026
- **Global EO Public Goods**
  - co-develop & mainstream EO capabilities to create/serve long-term demand, 12 thematic sectors
  - 2 sectors: Energy and Poverty-Fragility-Disaster – both 2Meuro, ITT Q3 and Q4 2026
- **EO Knowledge & Skill Transfer**
  - through continental capacity development programs in Africa (EO AFRICA), Asia & LAC
  - 3 regional Capacity development facilities for Africa, Asia and LAC – each 4Meuro, ITT Q3-4 2026
  - Global Knowledge Hub – 5 Meuro, ITT Q2/3 2026

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Action Readiness Planned Activities 2027-28

- **Global EO Public Goods**
  - co-develop & mainstream EO capabilities to create/serve long-term demand, 12 thematic sectors
  - Additional thematic sectors – Agriculture & Water, Urban & Transport, Climate & Disaster, Green Environment & Finance, Blue Environment & Finance, Resilient Social Infrastructure & Health, Rapidly Deployable EO Models
  - Each 2 Meuro, ITT across 2027-28 (pending Earth Action Workplans)

- **Alignment & Scaling through Partnerships 2026/27**
  - Partnership with DG INTPA & Global Gateway funding delegated for ESA implementation
  - South Asia Action – cooperation with 7 new countries & CDRI
    - South Asia – Stakeholder Engagement & Knowhow Transfer, 2 Meuro, ITT Q2 2026
    - South Asia – EO Service Co-Development, 2.5 Meuro, ITT Q2 2026
  - Preparation of **new Pan-Asia** Contribution Agreement: 42 M€, 4 years – start 2027
  - Preparation of **2nd phase of Africa-EU Space Partnership Program**: TBC M€, 4 years – start 2027

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ESA R&D collaboration and link to EC

- **Coordination channels already exist but margin for improvement, specially if uptake and spin in processes are defined and implemented across the value chain from science into operations.**

- **At the same time, while major priorities for ESA come from the community (though a continuous consultation process), ESA is open to address relevant priorities identified by the SRIA exercise through dedicated R&D projects, specially addressing fundamental EO research, early capability developments and EO science/ applications aspects.**

Existing coordination and collaboration activities of relevance include e.g.,

- ***EC (DG-RTD)-ESA Joint Earth System Science Initiative*** ***launched in 2020 aims to jointly advance Earth system science*** *and its contribution* ***to respond to the global challenges that society is facing*** *in the onset of this century. Programme is implemented through co-programming and* ***strong coordination of selected complementary activities funded by ESA FutureEO Programme and Horizon Europe*** *across different scientific domains: ocean health, polar, climate, agriculture, carbon…*

- ***The partnership between DG INTPA and ESA*** is leveraging and transferring mature R&D solutions based on Copernicus globally. Dedicated Actions as part of the Global Gateway initiative implemented in Africa, Asia, Latin America and Caribbean.

- ***Coordination with DG-DEFIS*** e.g for Rapid Action for Citizens with EO (RACE) to amplify public awareness of Copernicus investments through citizen-centric R&D approaches.

- Close collaboration with e.g. **DG-CLIMA, DG-ENV, DG-JRC, DG-AGRI, DG-ESTAT, DG-REGIO, DG-MARE and EEA** on key topics and policies (e.g., urban adaptation, biodiversity and Nature Restoration Law, newCAP, EUDR, water management, blue economy, EO for statistics, GHG carbon removal CRCF and Air quality Zero-pollution). All areas of relevance for Copernicus.

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New Integrated Policy Expert Scheme (IPES)

https://eo4society.esa.int/integrated-policy-expert-scheme-ipes/

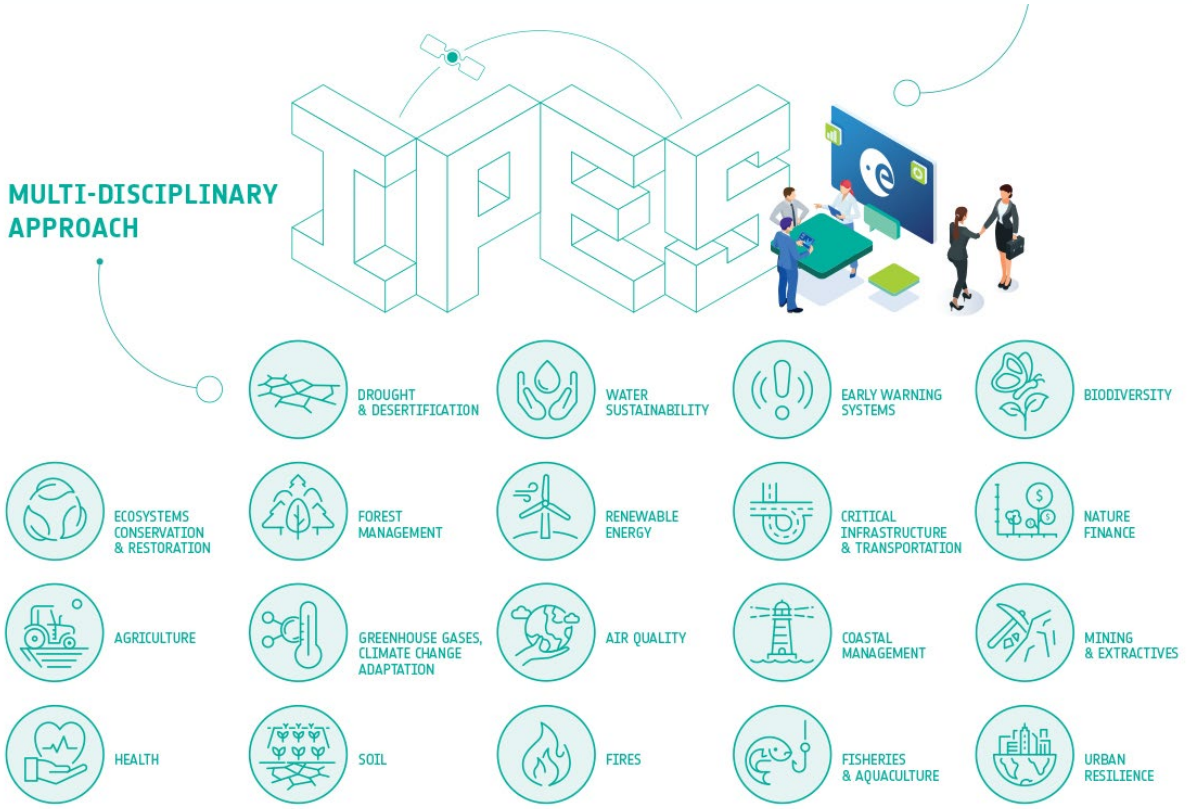
The policy expert is seamlessly integrated into the ESA team, fostering collaboration and leveraging unique insights to accelerate the implementation of effective strategies addressing the global climate and environmental crisis.
The scheme duration spans from four months to two years, with the possibility of renewal subject to mutual agreement. While actively engaged in ESA projects, the experts maintain their employment with their original organization. ESA assumes responsibility for covering related additional costs.

Launched in 2024.

Get in touch with ESA via the dedicated ipes@esa.int e-mail address.

INTEGRATED POLICY EXPERTS FROM

- INTERNATIONAL AND EUROPEAN ORGANIZATIONS
- NATIONAL / REGIONAL / LOCAL ENTITIES
- MULTILATERAL CONVENTIONS
- CIVIL SOCIETY ORGANIZATIONS
- INDIGENOUS SOCIETIES



MUTUAL BENEFITS

- SYNERGISTIC ACTIONS AND RESOURCE MOBILIZATION
- POLICY ALIGNMENT
- ENHANCED DECISION-MAKING
- INTERDISCIPLINARY HOLISTIC SOLUTIONS DEVELOPMENT
- STAKEHOLDERS AND END-USERS EMPOWERMENT
- EFFECTIVE INTEGRATION INTO POLICY FRAMEWORKS
- FOSTER OPERATIONAL UTILIZATION
- ENABLE ACTION FOR A SUSTAINABLE GREEN TRANSITION TOWARDS A CARBON-NEUTRAL, RESOURCE-EFFICIENT AND RESILIENT SOCIETY

Earth Action Permanently Open Call Specifics

Scope:

- All elements of Earth Action (Pillar 3 of Future EO)
- Core of activity is innovative EO data exploitation

Implementation

- Single proposal type
- 3 Submission batches per year
- Total of fewer than100 contracts over the 2026-28 period
- Certain batches may include priority foci per batch to complement generic block 4 scope (eg new sensor availability, response to time limited issues etc.)
- Rapid communication to unsuccessful bidders and improved debriefing (but limit on number of resubmissions)
- No requirement for national delegation to provide letters of support

Financial aspects:

- max value 250k Euro*

- No geographic return constraints (for ESA MS)

- First call will be open before summer 2026 (Q2)

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Earth Action

www.esa.int

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