Horizon Europe activities to prepare the community for Copernicus Expansion Mission exploitation

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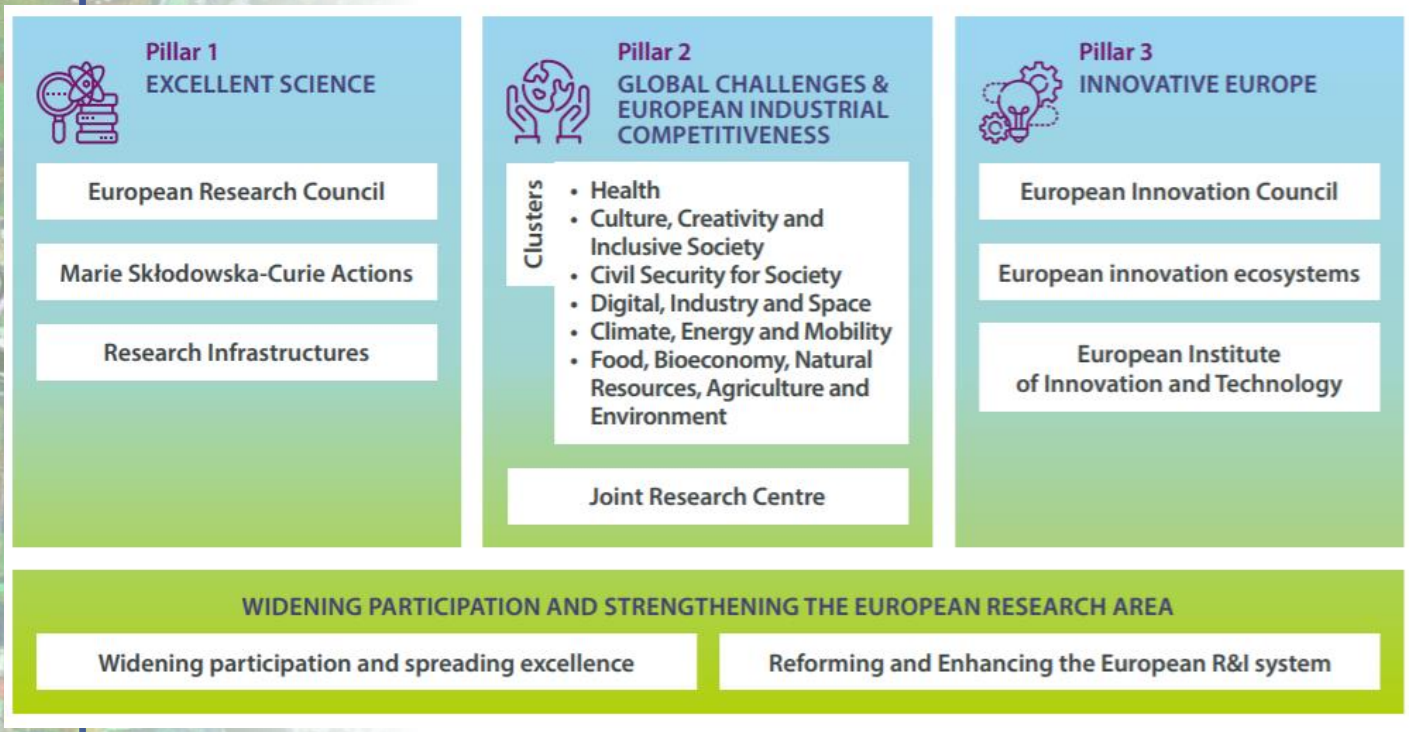
Horizon Europe



+EU Missions (e.g. adaptation to Climate change)

The Horizon Europe strategic plan 2025-2027 steers research and innovation funding 2025-2027, addressing the key global challenges such as climate change, loss of biodiversity, the digital transition and an ageing population.

The strategic plan sets out 3 strategic orientations for research and innovation investment under Horizon Europe for the years 2025-2027:

- Green transition
- Digital transition
- A more resilient, competitive, inclusive and democratic Europe

Strategic Research and Innovation Agenda

- **Goal**: update Earth Observation & Copernicus R&I priorities 2025-2027 and pave the way towards next MFF
- **Scope**: strategic agenda along broader value chain and TRL range
- **Key content**: SWOT, user requirements, evolution, services, upstream & downstream, horizontal, MoS, integrates CSS-SRA
- **Horizontal aspects**: AI/ML, computing and data infrastructures, thematic hubs, digital twins, synergies and partnerships
- **Process**: extensive consultation process with Stakeholders (DGs, agencies, entrusted entities, MSs-Copernicus delegates)
- **Teamwork**: the document was developed in cooperation between DG DEFIS, DG RTD and JRC
- **KCEO**: instrumental role to ensure strong research-policy nexus
- **Next**: mainstreaming Earth observation research (value chain, TRL range) across Horizon Europe and future Framework Programmes

Polar topics and CEMs in the SRIA

- Monitoring of polar regions listed as a gap to fill as a general recommendation
- CLMS, CMEMS and CSS outlines enhanced Arctic and polar monitoring as priorities:
  - investigate the potential to consolidate and enlarge the CLMS portfolio by proposing Arctic mapping products, focusing on reliable and consistent land use information, and addressing thematic gaps;
  - CMEMS – improved Arctic monitoring. Short term: Improved models for the Arctic Ocean. Also long-term with focus on CEMs and Thematic Hubs
  - CSS – user workshop. Reinforcement of capabilities over the Arctic and Atlantic were indicated as priorities, as well as extended coverage for fisheries control.
    - SESA: main focus area (ix) Climate Security (incl. Arctic and Polar)
- CEMs also high focus for ESA and EUMETSAT
  - CRISTAL mentioned as priority for bridging the Ku-band measurement gap

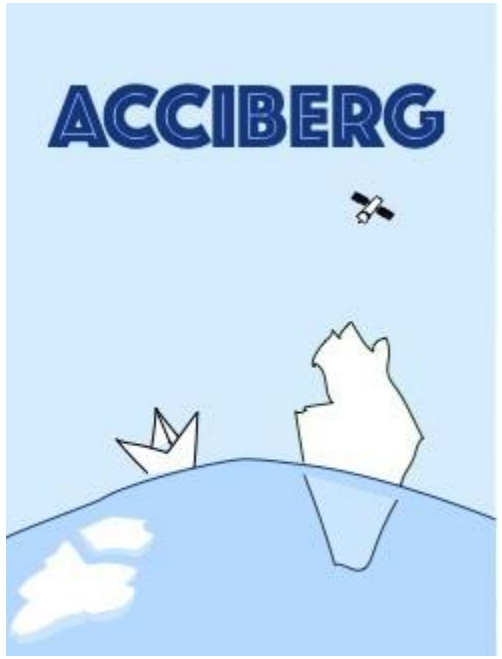
Current Horizon projects

European Commission

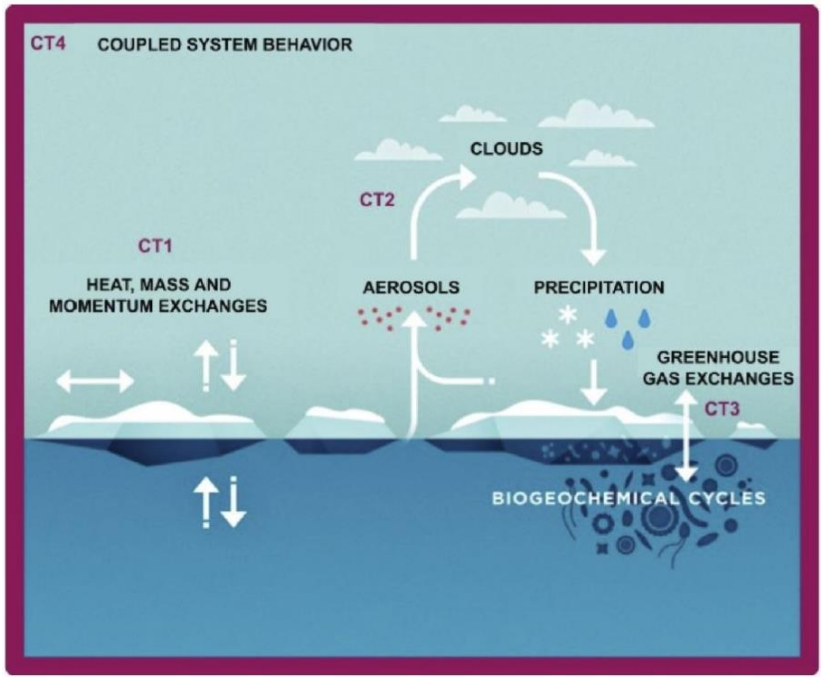
ACCIBERG - Arctic Cross-Copernicus forecast products for sea Ice and iceBERGs

The ACCIBERG project has three key objectives:

- **Iceberg forecasts:** to demonstrate two new prototypes of iceberg forecasts for detecting icebergs beyond Greenland waters
- **Sea ice forecasts**: to provide calibrated sea-ice forecast products for days to seasons ahead together with reliable uncertainty estimates.
- **Data Assimilation:** to improve the assimilation of sea ice parameters in operational ocean and sea-ice forecasting models
- **Started 2023**
- It is anticipated that the ACCIBERG prototype will enter the CMEMS Arctic MFC forecasts, and include CIMR data from 2030 on



CRiceS - Climate relevant interactions and feedbacks: the key role of sea ice and snow in the polar and global climate system



CRiceS focus on improving model predictions of the role of polar processes in the climate system that consists of the oceans, ice and snow cover, and the atmosphere

CRiceS will draw on past, ongoing and future activities/projects, including direct involvement and present/past leadership, such as:

- ESA and Copernicus satellite missions
- CRiceS will exploit current satellite missions (e.g., SMOS, CryoSat-2, Sentinel-1,2,3) **and contribute to the Copernicus expansion missions CIMR, CRISTAL and ROSE-L**

CERISE - CopERNIcus climate change Service Evolution

- CERISE will focus on the exploitation of low frequency passive microwave observations in the coupled data assimilation system using existing sensors such as SMOS and AMSR2 **in preparation of the Copernicus Sentinel mission CIMR.**
- Strong links between the CERISE consortium and the Copernicus operational Service will ensure efficient research to operation transition of the CERISE developments, with staged integration of the CERISE developments in **C3S** during the project and beyond during the current and future Copernicus phases. The integration of the CERISE developments in the core Service will directly enhance the C3S impacts on society. This is the main project pathway to impact.
- The output from CERISE once implemented in C3S, will directly be available to a wide range of users and stakeholders, including WMO, IPCC and research centres. **CERISE will pioneer the usage of new satellite retrieval observations, e.g. from the Metop-SG SCA instrument and in the longer term from the Copernicus Sentinels, also known as the Expansion missions, such as CIMR**.

EARTH SYSTEM SCIENCE INITIATIVE (ESSI) PROJECTS

- **MISO - Autonomous Multi-Format In-Situ Observation Platform for Atmospheric Carbon Dioxide and Methane Monitoring in Permafrost & Wetlands**
- develop and demonstrate an autonomous in-situ observation platform for use in remote areas, such as Arctic regions and wetlands, for detecting and quantifying carbon dioxide and methane gasses
- MISO observatories can be parts of monitoring infrastructures owned and operated by national governments, in different scales from global meteorological bodies to local conservation groups, to solve the challenges of mapping and navigating a complex landscape planned through Copernicus Expansion Missions.
- **LANDSEALOT - Land-Sea interface: Let's observe together!**
- The project aims to seamlessly integrate in situ, model, and earth observations to transform how we monitor the complex issues affecting our oceans. Specifically carbon flux, plastics, and eutrophication. Extensive citizen involvement.
- The provision of FAIR integrated observations of the LSI (Land-Sea Interface) will support future ESA Copernicus and Science Missions (e.g., S1 series, S2-NG, CHIME, S6).

Thank you

European Commission