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The realisation of a long-term partnership



A common goal

"... 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"

The European Commission's Deputy Director General for Research and Innovation, Patrick Child and ESA's Director general of ESA, Josef Aschbacher at the signing ceremony, January 2020.

Joint EC-ESA Earth System Science Initiative



ESA



FutureEO

ESA new Science and Innovation
Earth Observation Programme



EC-RTD

Horizon Europe

New EU Research and Innovation
Framework Programme



New ICT, Cloud Computing, AI, ...

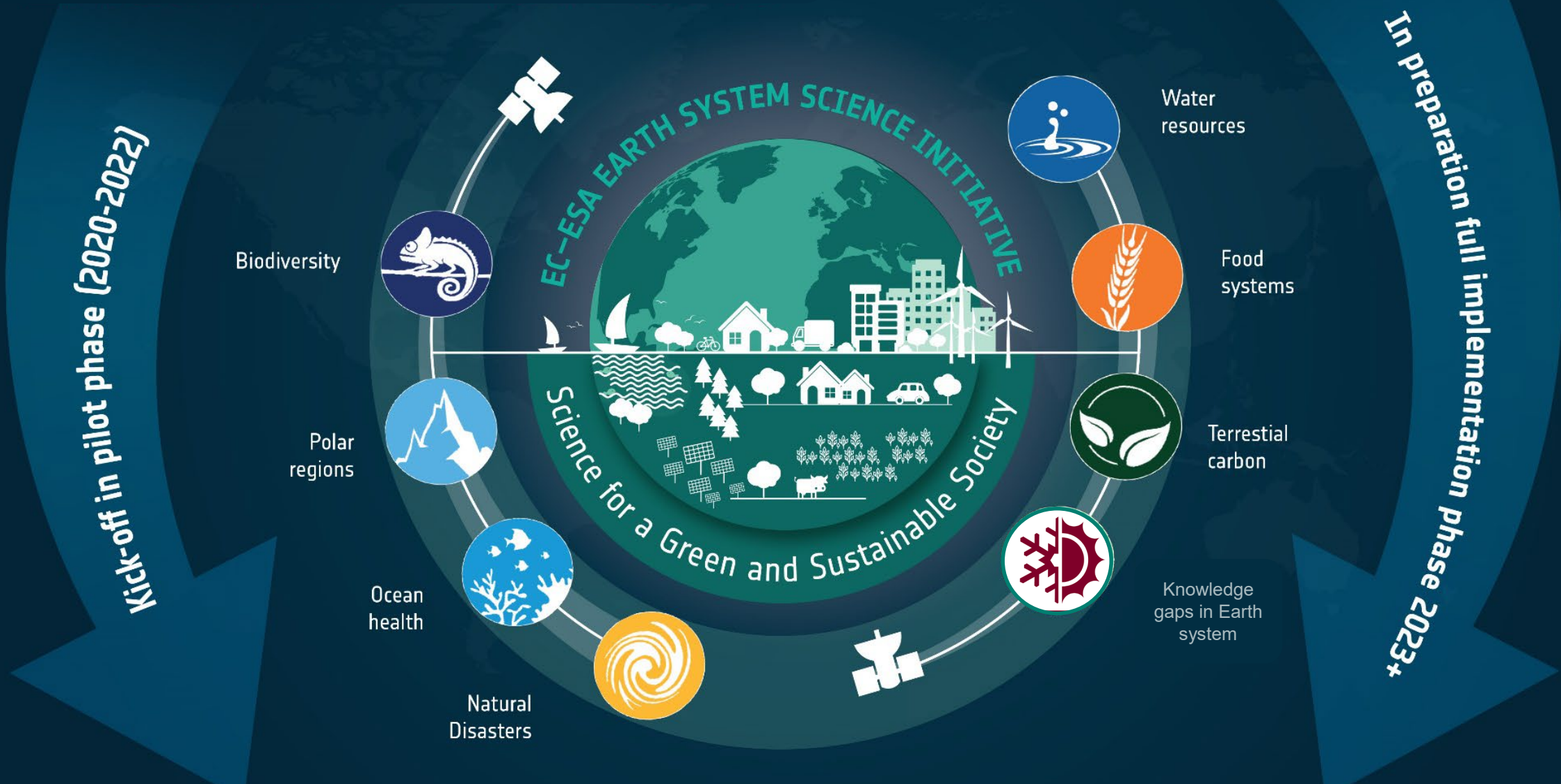
Interdisciplinary & Open Science

Enhanced models and predictions

In-situ Networks/citizen data



Priority Themes



A new collaborative model based on 3 basic pillars...



**Coordinated set
of EC HE calls
and ESA ITTs**

*Coordinated
complementary
projects
focusing on
common high-
level goals*



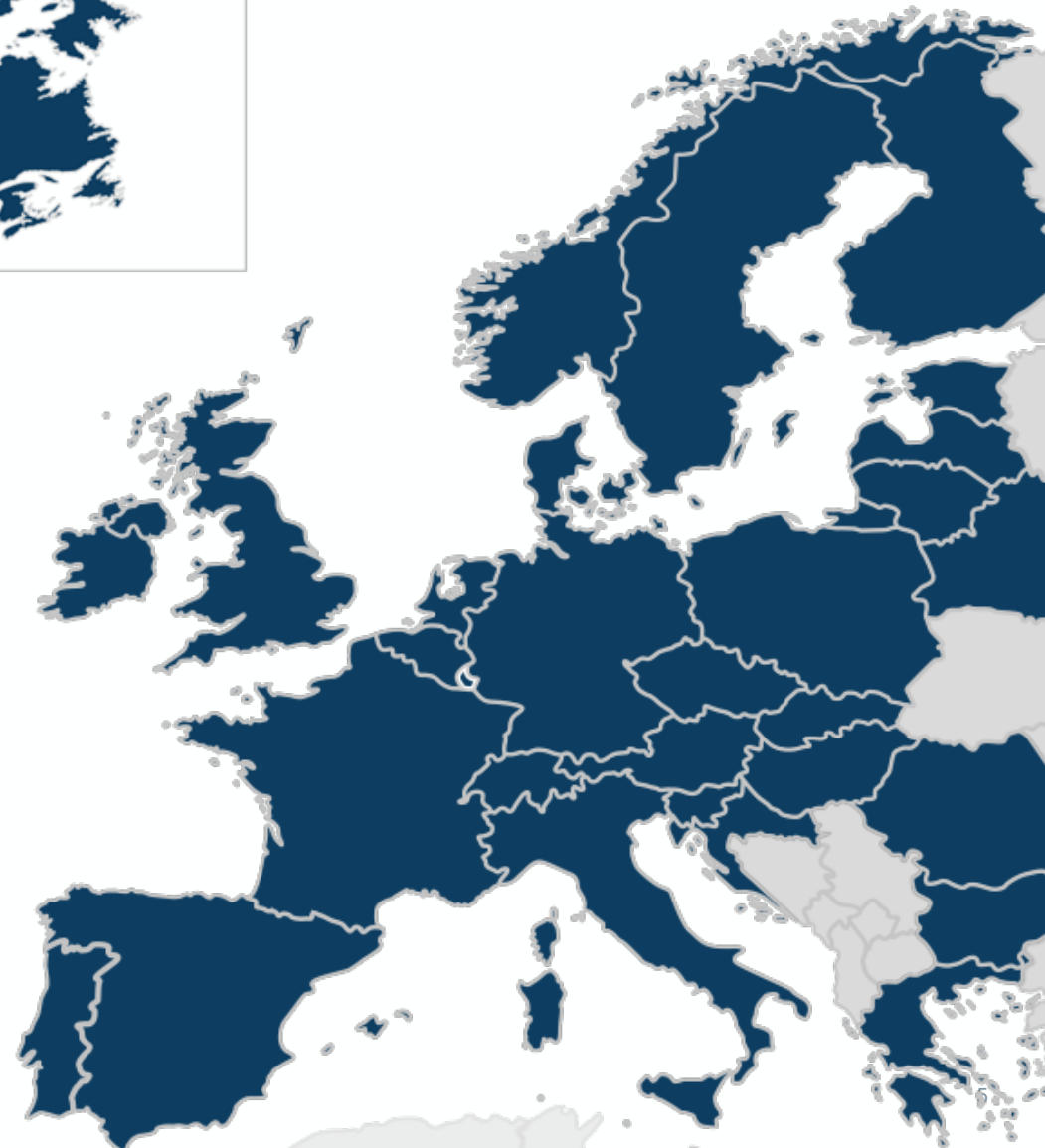
**Fostering
collaborative
research and
partnerships**

*New
mechanisms to
ensure
collaboration
between ESA
and EC projects*

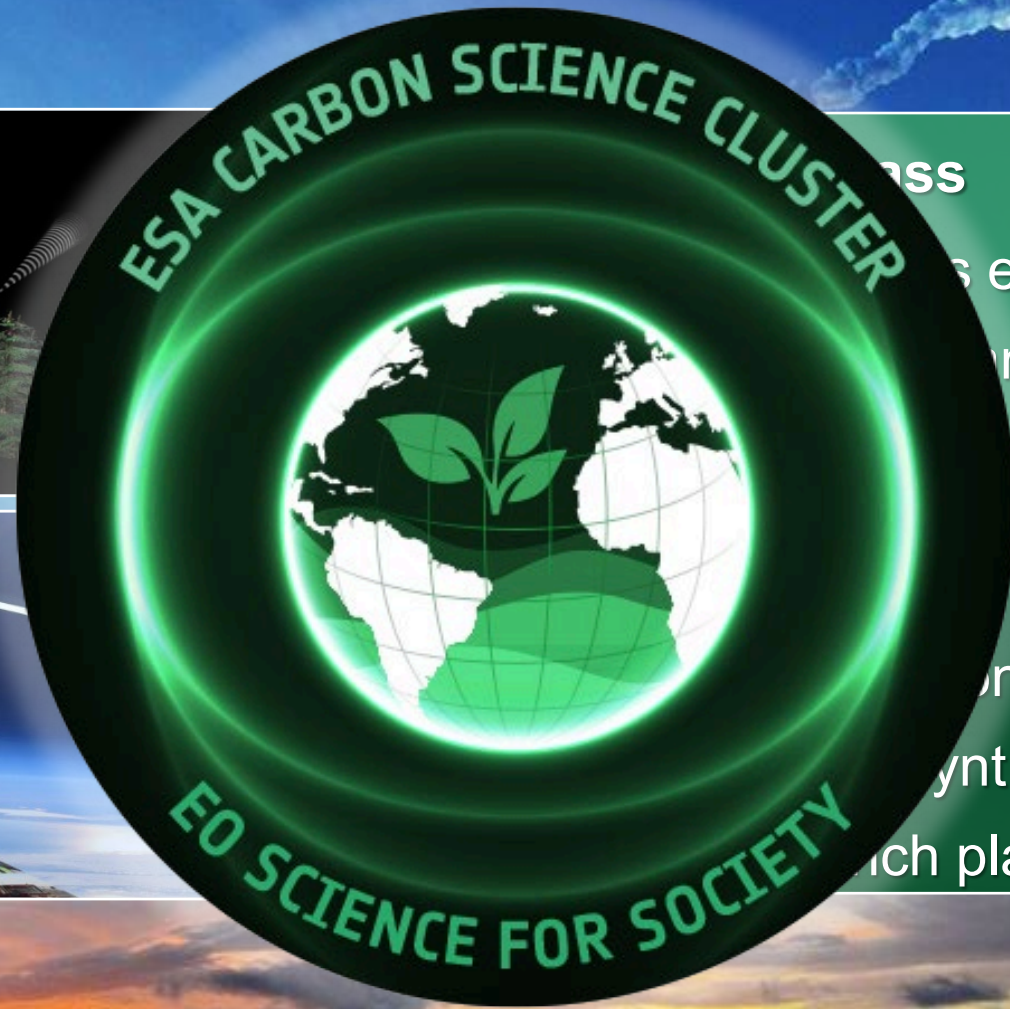
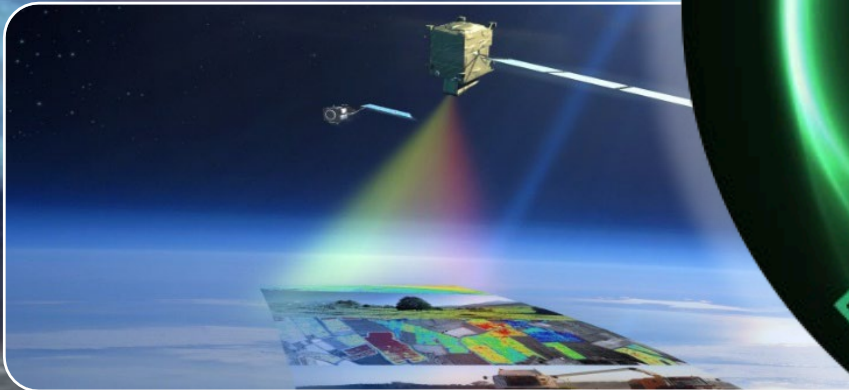
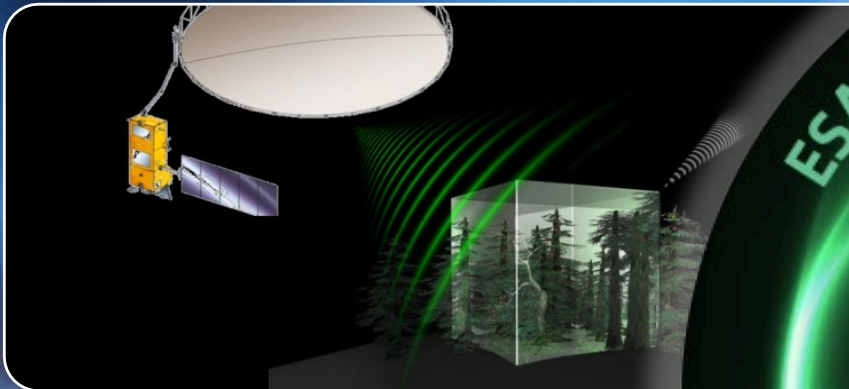


**Fostering
scientific
dialogue and
networking**

*Continuous
effort to
reinforce the
dialogue across
the community*



Upcoming Earth Explorers... New Opportunities



ass
s estimates
and SAR in space
anned 2023

on fluorescence,
ynthesis, plant stress
ch planned 2024



ESA
FutureEO



EC-RTD
Horizon Europe

Major step forwards in the ESA RTD collaboration: development of a package of coordinated topics under the WP 23-24 of Horizon Europe.

Moving into a more structured approach: 10 topics of the WP 23-24 of Horizon Europe will be specifically coordinated with ESA counterpart actions.

The coordination with ESA will add value to projects that will be funded in bringing in EO based science and EO ESA actions.

10 topics across clusters 3,5,6. Broad areas of collaboration include:

- Climate sciences and responses for the transformation towards climate neutrality
- Understanding and addressing the main drivers of Biodiversity loss
- Land, ocean and water for climate action
- A disaster resilient society for Europe
- Digital and data technologies as key enablers
- Deploying and adding value to Environmental Observations

Preparing 2023

- The ESA-EC cooperation would enable supporting **complementary collaborative projects, funded on the EC side through Horizon Europe and on the ESA side through the FutureEO programme.**
- It will result in a group/cluster of complementary projects pursuing a common objective in the domain of Earth System Science (*e.g.*, in the domain of biodiversity, healthy ocean, polar science, climate adaptation, extreme events, water cycle science, and science for sustainable agriculture).
- The EC projects would support R&I actions eligible under Horizon Europe while ESA projects would support EO science and developments, advanced and novel space assets, EO based Earth science and research and open science.



- The complementary calls will be organised through two separate calls launched by EC and ESA via their own programmatic mechanisms respectively and running in parallel.
- Selected EC calls and ESA ITTs are developed jointly by ESA and the EC. The text explains the overall goal of the coordinated activities including dedicated provisions to foster collaborative research and coordination across teams.

Terrestrial Carbon in Horizon 2020



- Important terrestrial carbon component in project **VERIFY** and **CCICC** - quantification key processes regulating the coupled carbon-climate system, and use observational constraints to provide long-term projections of the climate in response to anthropogenic emissions
- **LANDMARC** project will estimate the climate impact, potential for upscaling, and associated co-benefits and trade-offs of various land-based negative emission solutions, such as net sinks for greenhouse gases in agriculture.
- The project **applies earth observation monitoring**, a mix of climate, land-use and economic simulation models as well as local and regional stakeholder engagement activities across 16 case studies and five regional platforms.



Terrestrial Carbon in early calls Horizon Europe (21-22)



- Project: **GreenFeedBack** will enhance knowledge of the GHG dynamics in the ecosystems and link GHG in **terrestrial**, freshwater and marine **ecosystems**
- On carbon sequestration in forests: projects **ForestNavigator** and **FORESTPATHS**
- On the role of wetland | carbon sink: **Projects: ALFAwetlands (Wetland Restoration for the future)** and **REWET: (REstoration of WETlands)**
- The 2022 CL5 D1 has two relevant topics:
- HORIZON-CL5-2022-D1-02-01/ Verification and reconciliation of estimates of climate forcers
- HORIZON-CL5-2022-D1-02-05: Let nature help do the job: Rewilding landscapes for carbon sequestration, climate adaptation and biodiversity support



Challenge on Terrestrial Carbon to be tackled in Horizon Europe in the Future



- Ambition: develop an enhanced capacity to better characterise and reduce uncertainties of the carbon cycle related to key terrestrial European ecosystems
- Comprehensive approach: taking into account anthropogenic emissions, environmental forcing conditions, and management practices.
- Right scale of action: spatial resolutions required to enable actions necessary to move towards net-zero carbon balance
- Time dimension: understanding the dynamics and response of vegetation to climate change over time: short- and long-term stress, natural dynamics (e.g. fire), change in frequency, form and severity of extreme events

Launching an ambitious European scientific coordinate effort in 2023....



Kick-off of the
Full Implementation Phase
May 2023 (TDB)

**EC-ESA Earth System Science
Initiative Forum:
Science for Green and
Sustainable Society**

