GEO Week 2020

Statement GEO Week 2020

European Commission - European Co-Chair

"More than ever in the current situation, the value of GEOSS remains undeniable. The European Commission has continued its efforts to build GEOSS through European programs, such as Horizon 2020 and Copernicus, to ensure more accessible, interoperable and deployable information from Earth and Environmental Observations. This information is a crucial element in supporting the EU Green Deal and climate transition and in assessing the state of the Planet.

GEO initiatives carried out in the EU and on a global level have contributed to many domains over the last year, leading among others to collecting valuable information on the spread of COVID-19 and to empowering citizens to make sustainable choices."

Patrick Child
European Commission GEO Principal and
GEO Co-Chair
Deputy Director-General of the Directorate-General for Research and Innovation
European Commission

Find how the European Union contributes to the development of Earth Observation research and innovation-based solutions at transnational and international level: https://ec.europa.eu/research/environment/index.cfm?pg=earth

Discover how the European Union is a driving force within the international Group on Earth Observations (GEO) with its regional initiative EuroGEO: https://ec.europa.eu/info/research-and-innovation/knowledge-publications-tools-and-data/knowledge-centres-and-data-portals/eurogeo_en.

The EU Research and Innovation programmes have been pivotal in building the Global Earth Observation System of Systems (GEOSS) www.geoportal.org.

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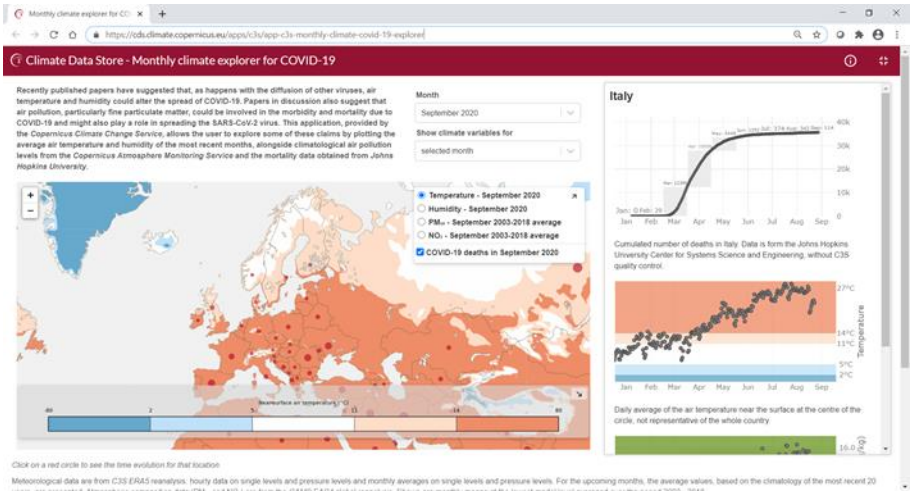
Copernicus

"In the context of the Covid-19 pandemic, the EU Space programme has been fully mobilised to develop a series of initiatives, notably to mitigate the impact of the crisis and provide support to public authorities.

The Copernicus Climate Change Service (C3S) helps health experts explore how temperature and humidity affect virus spread. *C3S developed an application, the Monthly climate explorer for COVID-19 and made it available on the Climate Data Store to allow users to explore some of these relations between the spread of the virus and some atmospheric and environmental variables. By making this information freely available to users, the C3S supports the United Nations Sustainable Development Goals (SDGs) and serves as an important resource to GEO and the Global Framework for Climate Services (GFCS)."*

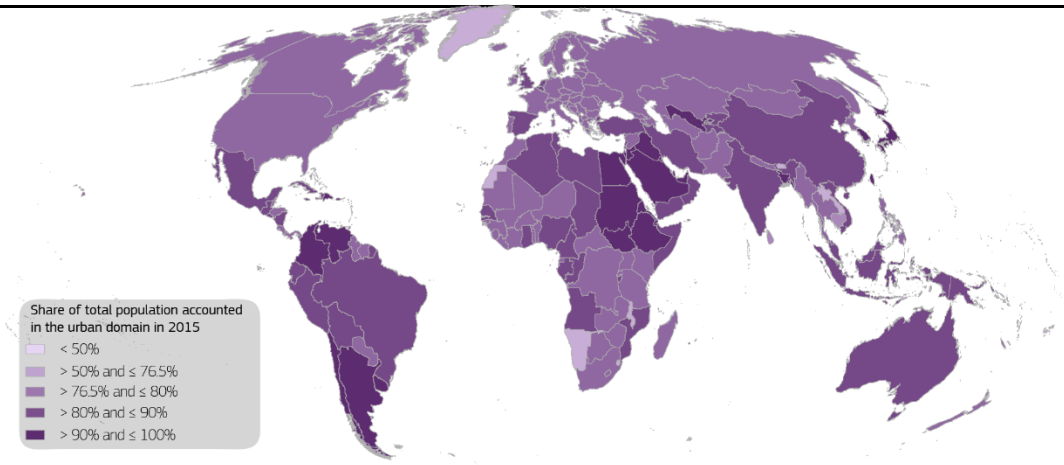


Mauro FACCHINI
Head of Earth Observation Unit
Directorate General for Defence Industry and Space
European Commission

The Global Human Settlement Layer supporting the global definition of Cities, Urban and Rural Areas

"In March 2020, the UN Statistical Commission endorsed a new method for delineating cities, urban and rural areas submitted by a coalition of six international organizations - the EU, International Labour Organization (ILO), FAO, OECD, UN-Habitat and World Bank. This Degree of Urbanization (DEGURBA) is now a globally recommended method for international comparisons of the built-up environment. This is a major achievement for the GEO Human Planet Initiative that promotes the use of Earth Observation data in this important policy area. Moreover, it is a major achievement for the European Commission Joint Research Centre (JRC) that provided the underlying global baseline data of population and built-up areas derived from Earth Observation and co-designed the definition with the Directorate General for Regional and Urban Policy. The definition will allow linking the SDGs indicator to urban and cities areas, which was not possible until now in the absence of a definition of cities. With the adoption of the method it is expected that a number of countries will seek support in application of the definition to their own data. For this, the JRC has developed already a training curriculum and a set of tools that allows countries to apply this definition to their local data."

More details on the (DEGURBA) and on the Global Human Settlement Layer (GHSL) support to the definition: https://ghsl.jrc.ec.europa.eu/degurba.php



Share of country population in the urban domain in 2015

Alessandra Zampieri
Head of the Disaster Risk Management Unit
Joint Research Centre of the European Commission

A major EU Action towards global Ocean Observations

"The European Union has invested for years in the domain of Ocean Observations sustaining the pace among those striving for a Sustainable Ocean. The Foreign Policy Instrument (FPI) of the European Commission has chosen GEOWEEK 2020 to announce the launch of an unprecedented move towards an international, global in-situ observation strategy for the long-term. The FPI Action aims at enhancing the development of global Ocean Observations and their impacts on society, by jointly strengthening the EU contribution to the GEO Blue Planet initiative and to the G7 Coordination Centre of the Global Ocean Observing System (GOOS).

This FPI action, entitled "International ocean governance: EU component to global observations" has been entrusted to Mercator Ocean International and we are currently setting up a dedicated team that will work over the next two-years in tight coordination with the European Commission, the G7 Coordination Centre and the GEO Blue Planet Secretary.

We have called this project "EU4OceanObs". It will be based on three inter-related components: Scientific Diplomacy, Technical Coordination and societal awareness and outreach that will focus on the six areas of EU interventions to promote international ocean governance: the blue economy, climate change monitoring, sustainable fisheries, maritime security, marine pollution, and marine protected areas."

Pierre Bahurel
Director General
Mercator Ocean International

e-shape: EuroGEO Showcases: Applications Powered by Europe

"e-shape is an unique initiative under the EU-funded Horizon 2020 programme that seeks to accelerate a breakthrough in the European Observation sector and serving GEO through further shaping the EuroGEO initiative. e-shape develops and promotes European EO capabilities with and for the users through a co-design approach with as a key element to bring new partners on-board.

The pilots under e-shape are useful real-world applications and this year, e-shape is on-boarding five new pilots with the aim to bring new contributors and users in GEO.

Two services have become available online. The nextSENSE service was implemented in the framework of the e-shape's Renewable Energy Showcase and provides continuous monitoring and short-term forecasting of solar energy in real-time for Europe and North Africa. It is based on Earth Observation data (EUMETSAT's SAF NWC, Copernicus CAMS), fast radiative transfer models (AMT, 2018), motion flow modelling techniques and high performance computing.

The Harvester Seasons was implemented in the framework of the e-shape's Climate Showcase and provides assess conditions for forest trafficability with heavy harvesting machinery, preventing damaging of the topsoil of the forest floor. Harvesting machines weigh about 20 tons and require good bearing capacity of the terrain to avoid the machines from getting stuck. These services and the future ones will be made available through the e-shape website and the GEO portal."

Prof. Thierry RANCHIN
Director of Centre Observation, Impacts, Energy,
MINES ParisTech – PSL University/ARMINES
Scientific coordinator of e-shape

WeObserve

"WeObserve (weobserve.eu) is an H2020 funded project that delivers the vision that Citizen Observatories (COs) and community-based environmental initiatives are an integral component of monitoring and managing the environment towards sustainable environmental stewardship. Integrating citizen science (CS) and Earth Observation (EO) by connecting COs and CS initiatives with GEOSS is essential to achieve this and needs to be pursued from both sides.

The WeObserve Communities of Practice on data interoperability and standards, and on the SDGs, have tested interoperability solutions, developed best practices for data standardisation and highlighted, for the first time, the detailed potential of CS for SDG monitoring, respectively. CS and COs complement EO as a potential data source, and they provide in-situ data for validation. WeObserve also supported the formulation of the Lisbon Declaration, a declaration issued by and with the community of Citizen Observatories and Citizen Science practitioners. It provides a roadmap and key recommendations for the integration of Citizen Science communities as well as their activities, outputs and data into GEOSS."

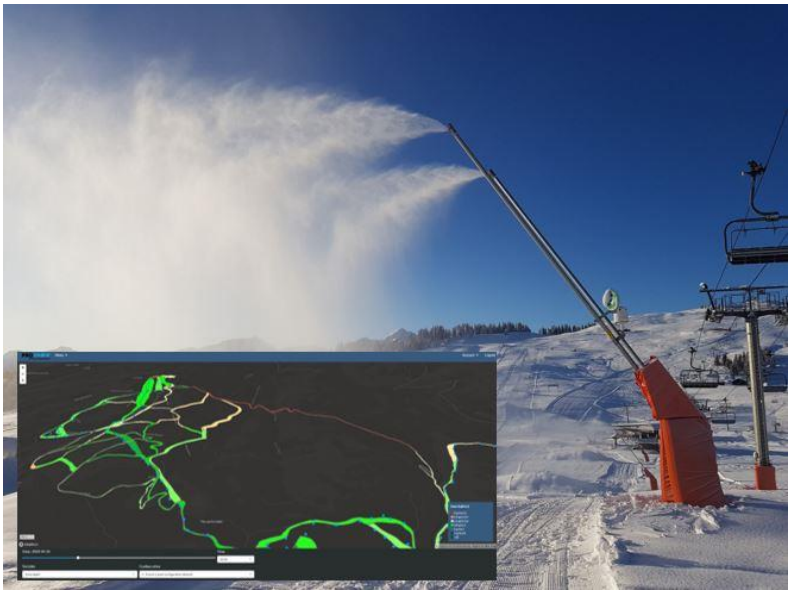
Collage of WeObserve activities, supporting and complementing the vision of GEO

Steffen Fritz - Deputy Program Director, Ecosystem Services and Management Program, International Institute for Applied Systems Analysis

Gerid Hager - WeObserve Project Lead, International Institute for Applied Systems Analysis

PROSNOW: Provision of a prediction system allowing for management and optimization of snow in Alpine ski resorts

"The PROSNOW project, funded by Horizon 2020 from 2017 to 2020, has built synergies between weather and seasonal forecasting, in-situ and Copernicus Sentinel-2 satellite observations, and snow cover modeling, through standardized data exchange mechanisms to deliver real-time optimization of grooming and snowmaking in ski resorts. Bringing together academic and industrial partners in Austria, France, Germany and Switzerland, and co-designed and tested by 9 pilot ski resorts across the European Alps during the winter 2019-2020, this service is being implemented commercially starting for the winter 2020-2021. It supports ski resorts operations under increasingly challenging operating conditions due to climate change, while reducing the related use of water and energy. It contributes to raising awareness on climate change impacts and societal transitions in mountain areas." https://prosnow.org/



Snowmaking is used to prepare the ski slopes in early winter season and compensate for the possible lack of natural snowfall. The PROSNOW user facing tool (onset) provides a map-based representation of the state of snow cover in ski resorts, at present and several days to weeks into the future, for various snow management options, enabling better snow management decisions through better anticipation of the consequences of possible operational choices.

Samuel Morin
Research scientist at CNRM (Météo-France and CNRS), France.
Coordinator of the H2020 PROSNOW project

NextGEOSS: Next Generation GEOSS for Innovation Business

"The NextGEOSS project (www.nextgeoss.eu) is coming to an end in 2020.

The NextGEOSS data hub and platform resources have been used by 14 pilots from thematic domains across the entire GEO Work Program, ranging from flagships like GEOBON and GEOGLAM and multiple initiatives GEO Vision for ENERgy (GEOVENER), GEO Wetlands, Blue Planet and more, to community activities such as ArcticGEOSS and GEO Citizen Science, to mention but a few. NextGEOSS will continue to contribute to the foundational tasks covering development of GEOSS for access to data and the latest technologies, next to capacity development activities. NextGEOSS is showcasing data hub and platform services that are now fully available to any user in the global GEO community. These services are sustained through several ongoing activities like the H2020 projects e-shape, INTAROS and NextLand and the national exploitation project in Norway. NextGEOSS is also included in the ESA's Atlantic Regional Initiative, Network of Resource and more.

In establishing the GEO community activity NextEOS (Next Generation Earth Observation Services) and other activities, NextGEOSS' key partners, including its thematic pilot communities, show their commitment to continue the European project's legacy, by maintaining, building and further engaging communities, leveraging the results."

"...What you have done now goes beyond what is available currently in GEOSS, and you have shown that you have the capability to improving GEOSS..."

Gilberto Camara, Director GEO secretariat at the NextGEOSS 4th Summit 2020

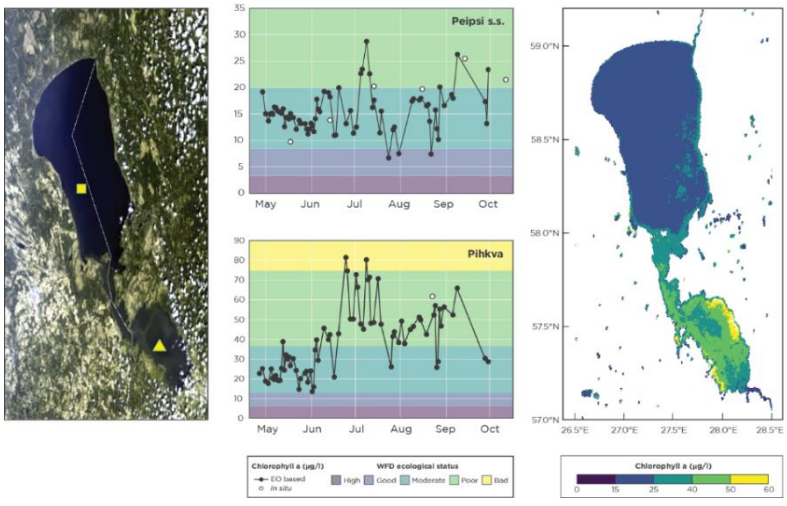
Nuno Catarino
Head of Payload Data Ground Segment / Data Systems Division of the DEIMOS Group
Coordinator of the H2020 project NextGEOSS

Bringing satellite observations into water quality monitoring policy

"Information from satellites can enhance confidence in regulatory reporting of ecological status, by quantifying elements that are not well captured with in situ sampling. These include the frequency, onset, duration and extent of phytoplankton blooms, which negatively impact water quality. Satellite observation would further improve the representativeness of the natural diversity of waterbodies that are monitored, highlighting inter-annual variability and water quality trends within larger waterbodies. Using standardised approaches, management of transboundary waters can be facilitated and even allow global stocktake and trend analysis.

A recent White Paper, supported by independent international experts, highlights case studies from H2020 projects EOMORES (Earth Observation based services for Monitoring and Reporting of Ecological Status) and CoastObs (Commercial service platform for user-relevant coastal water monitoring services based on Earth Observation), from inland and transitional waterbodies, analyses potential barriers and provides recommendations for increased satellite-based information to support the European Water Framework Directive."

The White Paper, *"Satellite-assisted monitoring of water quality to support the implementation of the Water Framework Directive"* is available here: https://doi.org/10.5281/zenodo.3463050



Lake Peipsi, on the border of Estonia and Russia, experiences annual phytoplankton blooms exceeding its ecological quality targets set under the EU Water Framework Directive. Satellite observations reveal the extent, frequency and duration to inform management practices. For more information see https://doi.org/10.5281/zenodo.3463050.

Assoc. Prof. Stefan Simis
Earth Observation Scientist
Plymouth Marine Laboratory,
United Kingdom

CORDIS Results Pack on 'Environmental observations for informing citizens and supporting policymaking through innovative applications'

"Horizon 2020 is the biggest EU Research and Innovation program ever with nearly €80 billion of funding available over 7 years (2014 to 2020). It enabled more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market. By supporting the GEO initiative and the Copernicus program, and by funding related research activities in Horizon 2020, the EU is actively contributing to worldwide efforts to build a global observation network.
This CORDIS Results Pack showcases the results of nine Horizon 2020-funded projects, which have been building on these assets to develop commercial applications, create benefits for our citizens and support better policymaking in the field of Environmental and Earth Observation. They are also actively helping to fully realise the EuroGEO initiative.
The projects highlighted are:

- *NextGEOSS (https://nextgeoss.eu/) has developed a European Data Hub and Platform*
- *The citizen observation projects GROW Observatory (https://growobservatory.org/), Ground Truth 2.0 (https://gt20.eu/), LANDSENSE (https://www.landsense.eu/) and SCENT (https://scent-project.eu/)*
- *ECO-POTENTIAL (http://www.ecopotential-project.eu/) used EO data to understand and monitor ecosystem changes in protected areas.*
- *AtlantOS (http://atlantos-ocean.org/) has strengthened and integrated EO capacities across the Atlantic*
- *The GEO-CRADLE project (http://geocradle.eu/en/) helped the North Africa, the Middle East and the Balkans to optimise the use of EO*
- *A short introduction to the 4-year e-shape (https://e-shape.eu/) that is shaping the establishment of the EuroGEO initiative and creating benefits from it."*

https://cordis.europa.eu/article/id/421641-environmental-observations-informing-citizens-and-supporting-policymaking-through-innov

Full Statement

Group on Earth Observations – GEO Week 2020

Statement of the European Commission

The Copernicus programme, the Framework Programme for Research and Innovation (Horizon 2020) completed by the EuroGEO initiative remain the backbone of the European Union's efforts in the field of Earth and Environmental Observations. These instruments are fundamental in contributing to and supporting the Global Earth System of Systems (GEOSS). The successors of both the Copernicus program and Horizon 2020 are in their final drafting stage. The aim is to ensure sufficient attention and funding for Earth and Environmental Observation activities in Europe for the years to come.

Specific highlights

Highlights of this year include securing extra support under the EU Foreign Policy Instrument for European Ocean Observation within the GEO Blue Planet initiative with the support of Mercator-Ocean International (see example).

Furthermore, the European Space Agency and DG Research and Innovation have significantly strengthened their cooperation with the '*EC-ESA Joint Earth System Science Initiative*'. Its aim is to jointly advance Earth system science and promote its contribution in responding to global challenges.

Copernicus

The Copernicus program is helping health experts to explore how temperature and humidity affect the spread of COVID-19 (see example Copernicus).

The launch of Sentinel-6 Michael Freilich is planned on 10 November 2020. It is the outcome of a long-standing and fruitful transatlantic cooperation, which is captured in the very name of Sentinel-6 Michael Freilich to honour the value of international cooperation.

The mission will look at monitoring the global ocean, contributing to expand further the available data and information provided by Copernicus.

Its primary mission is high-precision ocean altimetry, providing information on sea surface topography including sea level and significant wave height. Its secondary mission is radio occultation, an essential input for climate monitoring and weather forecasting.

The Copernicus Sentinel-6 Michael Freilich mission is a joint initiative of ESA (European Space Agency), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), NASA, and the National Oceanic and Atmospheric Administration (NOAA), with funding made available by the European Commission and support from France's National Centre for Space Studies (CNES).

The finalisation of the EU Regulation governing the EU Space Programme 2021 -2027, which includes Copernicus, is currently ongoing.

EuroGEO initiative

The EuroGEO initiative has continued to develop and further establish itself since its launch in 2017. EuroGEO aims to ensure a structured and efficient European contribution to the Group on Earth Observations. As such, it is addressing end-user and citizen needs, turning EO into reliable

and usable information and guaranteeing that the data is utilised in the most effective way. The European Union has been providing constant financial support through Horizon 2020 to EuroGEO.

Due to the current COVID-crisis, the annual EuroGEO workshop to be held in Paris has been postponed to Spring 2021. To ensure continuity within the EuroGEO community, a webinar was held on 8 June 2020. The webinar *'Increasing the EuroGEO role into GEO'* was co-organised by the European Commission and the French Ministry of Higher Education, Research and Innovation with the support of MINES ParisTech.

The Horizon 2020 project e-shape (*EuroGEO Showcases: Applications Powered by Europe EuroGEO*) has continued its efforts to shape EuroGEO with the nextSENSE and the Harvester Seasons – Climate service becoming available online and the on-boarding of five new pilots (see also the e-shape example).

EU Green Deal

Climate change and environmental degradation are an existential threat to Europe and the world. To overcome these challenges, the European Union is working on a new growth strategy that will transform the Union into a modern, resource-efficient and competitive economy.
This so-called "*European Green Deal*" is our plan to make the EU's economy sustainable, by turning climate and environmental challenges into opportunities, and making the transition just and inclusive for all.

To support the Green Deal, the European Commission has launched the last and biggest call under Horizon 2020 in September 2020, tabling €1 billion for research and innovation projects that respond to the climate crisis, help protect Europe's unique ecosystems and biodiversity and to boost the green and digital transitions. The European Green Deal (EGD) call will contribute directly to the EU's Recovery Plan for Europe in the wake of the COVID-19 crisis.
The development of new technologies, sustainable solutions and disruptive innovation is critical to achieving the objectives of the European Green Deal.

The EGD call is a key instrument and the first R&I tangible action to deliver on the Commission's (green) recovery actions. The Green Deal Call aims for clear, discernible results in the short to medium-term, but with a perspective of long-term change. There are fewer, but more targeted, larger and visible actions, with a focus on rapid scalability, dissemination and uptake.
To deliver such concrete and practical solutions the use of data and information will be fundamental and the Green Deal call refers to the necessary integration of Environmental Information in the solutions. It refers to Copernicus and the GEO initiative in the context of the green transition, climate services, citizen observations and the delivery of climate information through the GEOSS infrastructure.

Update other Horizon 2020 activities related to GEOSS

Many of our Horizon 2020 activities related to GEOSS are well on their way, as shown by the different examples provided in this written statement, including the CORDIS Results Pack on 'Environmental observations for informing citizens and supporting policymaking through innovative applications' (https://cordis.europa.eu/article/id/421641-environmental-observations-informing-citizens-and-supporting-policymaking-through-innov).

Next to the ongoing projects, five new projects started between 1 May and 1 October 2020, supporting the development of Earth Observation services in cooperation with the commercial sector through the use of GEOSS and Copernicus data.

Horizon Europe

Over the last year, the next European Programme for Research and Innovation, Horizon Europe (2021-2027) has been taking shape.

The proposed structure of Horizon Europe consists of 3 pillars: 1. Excellent science, 2. Global Challenges and European Industrial Competitiveness and 3. Innovative Europe.

In particular, the second pillar, which includes 6 Clusters, will offer ample opportunities for the continuation of Earth and Environmental Observation-related research and innovations activities, with specific references to Copernicus, GEO, EuroGEO and GEO.

Next to the different pillars, five missions are proposed. A mission is a portfolio of actions across disciplines intended to achieve a bold, inspirational and measurable goal within a set timeframe, with impact on policy-making as well as relevance for all Europeans.

The proposed missions are:

1. Conquering Cancer: Mission Possible
2. A Climate Resilient Europe - Prepare Europe for climate disruptions and accelerate the transformation to a climate resilient and just Europe by 2030
3. Mission Starfish 2030: Restore our Ocean and Waters
4. 100 Climate-Neutral Cities by 2030 - by and for the citizens
5. Caring for Soil is Caring for Life

The missions will launch in 2021 as part of Horizon Europe and Europeans will continue to be engaged in all phases of their implementation and will require a massive amount of data and information to be able to deliver.

Finally, 49 partnerships are proposed, as a new generation of objective-driven and more ambitious partnerships in support of agreed EU policy objectives. They have as key features: A simple architecture and toolbox, a coherent life-cycle approach and a strategic orientation. ‘Agriculture of Data’ is one of the candidate partnerships and it aims to support sustainable agriculture in the EU as well as the policy monitoring and implementation, by using the possibilities the current digital and data technologies in combination with Environmental Observation offer.

Next to the different pillars, also the mission and partnerships offer opportunities for, on the one hand, the Earth and Environmental Observations community to contribute and, on the other, parts of their results to be integrated in GEOSS.