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Be a part of the future EuroGEO
Project 101134335 — EuroGEOSec

A large circular graphic is centered on the page. It contains a blue and orange abstract pattern, possibly representing a celestial body or a data visualization. The pattern is composed of many small, bright points and streaks, giving it a dynamic, high-tech appearance. The background of the entire page is white with faint, light blue lines and dots, suggesting a network or data flow.

EuroGEO Workshop 2025 report
The Hague, Netherlands 13 – 15 October

#OneEuroGEO

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About EuroGEOsec

The EuroGEOsec project (12/2023 – 11/2025) supported the EuroGEO vision and prepared the transition of the EuroGEO initiative into a sustainable endeavor. EuroGEOsec organised two EuroGEO Workshops:

- The Hague, The Netherlands, 13 – 15 October 2025, co-organised with the Netherlands Space Office (NSO). <https://eurogeosec.eu/egw2025/>
- Krakow, Poland, 8 – 10 October 2024, co-organised with the Polish Space Agency (POLSA). <https://eurogeosec.eu/egw2024/>

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Welcome by Harm van de Wetering, Director, Netherlands Space Office

Ladies and gentlemen,

It is a privilege to welcome you here in the Netherlands, and to be part of this year's EUROGEO conference. This gathering is not only about science, not only about data. It is about building a community. About finding each other. About learning how we can make Earth observation more visible, more useful, and more connected across Europe. And finding solutions for our societal challenges - is really a message close to my heart.



In my role as Director of a Space Agency I visit quite a lot of conferences. But I must say my heart is most with conferences like these, where it is all about the use of space for society. Since this is also our Motto: The real value of our activities in Space lay here on Earth. The Earth is facing many challenges. Whether it is about wildfires, whether it is about flooding, about access to fresh water, or about food security or security in a broader sense. Earth Observation in many cases gives a unique perspective. A unique perspective for research to understand our earth systems better. And as the next step we might also work on solutions – From research to operations is the next challenge!

One of these 'other' conferences was a week ago in Sydney where I heard a quite inspiring call, which I want to share with you. Last week I was in Sydney where I was representing NL in a so-called Space Leaders' Summit. Each of the Nations were given 2 mins time to share their ideas and vision. You might find it positive that my intervention was on Earth Observation, where I underlined the importance of sharing our Earth Observation data and sharing our scientific research based on that. Which is not an option, but a necessity. But what I wanted to highlight is the intervention I liked best. Amongst all other speakers I was most touched by Ms Aarti Holla Maini. The Director of the UN office for Outer Space Affairs. For what she said is basically what I think our efforts in space should be all about. So as a 'gift' for you I copy her remark as inspiration for this conference.

She said: "Our space-economies are still focusing on indicating the amount of success to the numbers of launches and number of satellites in Space. And if that is what we indicate as success, and if that is what we measure we will get more of that!" Her call to the world was to replace these targets for much more to introduce new targets. And I think that is exactly what we need. Instead of counting how many satellites were launched, we could focus on the real goals like: How many farmers were benefitting from weather information, how many lives do we protect from drowning or wildfires, how many yields were protected from drought or diseases? How many forests were proven sustainable without illegal activities. Since these are reasons for the whole earth observation ecosystem! I encourage you these days to come up with some of these goals that should drive us the coming years.

I am very happy and proud that this year's EUROGEO is in The Netherlands. And one reason for trying to get this conference to The Netherlands is that here in The Netherlands User-uptake is an important strategic topic. In our national space policy it is one of the main strategic goals. In our own organization we have a dedicated team of experts especially working on this strategic goal. And just recently we, jointly with the Ministry of IenW, we boosted the brand GEO Netherlands to strengthen even more cooperation and to enable more benefits of Earth Observation to society.

And we also are proud we also have a vibrant community of researchers, companies, and innovators working at the forefront of technology.

Over the years in The Netherlands multiple operating solutions have been developed in public private partnerships. Dutch organizations have developed smart applications that already help millions of small farmers in Africa and Asia to increase their food production. But also numerous applications have been developed for local challenges in The Netherlands, like for indicating risks of flooding or indicating best spots for windmills.

These examples show what drives us: using space infrastructure for security, for monitoring our environment, and for advancing science.

Since you are this week in The Netherlands, I hope you will all notice this week some of this Dutch entrepreneurship. The entrepreneurship that once was necessary to build dikes and windmills so to keep our feet dry. But in this new decade: entrepreneurship to keep an eye on the quality of the dikes by means of applications based on Earth Observation.

We know in general that connections between Earth Observation communities, and between these communities and user communities, are not yet as strong as they could be. EUROGEO offers us all the chance to change that. To bring European developments closer to each other. And for a strong Europe especially in Earth Observation I find it really important. It is not a secret any more that under the current administration in the US investments in Earth Observation will be cut and also research on climate change is at risk. To be able to keep a worldwide strong Earth Observation Community it is only more important that Europe keeps a strong community.

In my opinion, the role of governments and space agencies is just to create the framework and provide support. But the true success is created by scientists, engineers, entrepreneurs, who work every day at the limits of what is currently possible.

And conferences like EUROGEO are part of that task: they make it easier for people to meet and connect across borders, across disciplines.

So here I come to an end Ladies and gentlemen, Earth observation – as you all know - is way more than satellites and sensors. It is about how we can make use of it. It is about how we, together, will be able to use this knowledge to understand our Earth systems better and as a next goal, also aim to improve sustainable live on Earth. From science to operations.

So I invite you to use these days to connect, to inspire each other. Not only talk about EO to users, but most importantly to listen to the users of satellite data and work towards understanding their needs. We invite users and the EO community to engage with each other so we can incorporate their needs.

The level of success of Earth Observation – which is not the number of satellites, but in real use for our society – depends – for a great deal – on the good connections and cooperations that will arise from conferences like these.

I wish you all of luck this week. Thank you.



Welcome by Joanna Drake, Deputy Director-General, European Commission, Directorate-General for Research and Innovation

Dear participants to the EuroGEO Workshop 2025, it is a great honour for me to join you in this session on Research and innovation for the EO service sector.

Like a year ago at the EuroGEO workshop in Krakow, I gladly followed the invitation to meet the Europe GEO in The Hague, and I am particularly thankful to both the EuroGEOSec project and the Netherlands Space Office for having organised this event.

I am genuinely impressed by the enthusiasm, the dynamics and forward-looking attitude of this community. Before going into the heart of my intervention, I would like to start with a comforting message delivered by our President Ursula von der Leyen in her State of the European Union Address in September. She highlighted that science is “one of the most valuable global goods”. And announced a doubling of budget for the next Horizon Europe programme.

The Horizon Europe proposal and the Competitiveness Fund come with an increased attention to defense and space, with a proposal totaling €131 billion for these two sectors, five times the amount of the current Multiannual Financial Framework, which clearly shows that Earth Observations is a priority. Work has just started with the Parliament, the Council and the Member States to translate this ambitious proposal into actions.

Last year I shared with you a few considerations on the geopolitical landscape evolution and how it would impact our community. Unfortunately, the situation has further deteriorated, and every day brings its lot of surprises, questioning of multilateral settings, science denials, misinformation campaigns and others. In this particularly difficult context, we strive for an ambitious Europe, ready to defend our values, our sovereignty, and our freedom. While working on the next steps of the Multiannual Financial Framework, over the past months and weeks we have progressed on a number of files that can directly impact our Earth Observation domain.

Let me start with the adoption of a few key initiatives that I invite you to consider with attention. On 15 September 2025, the Commission launched a new strategy to strengthen Europe’s research and technology infrastructures. The strategy ensures that scientists, researchers, innovators, and industry have easy access to Europe’s cutting-edge facilities, high-quality data and tailored services. It also aims to encourage world-class researchers and innovators to ‘Choose Europe’.

Another example is the Startup and Scaleup Strategy which sets out legislative, policy and financial support measures, at both EU and Member States level, to address the needs of innovative companies throughout their development.

Third, the Strategy for AI in Science, adopted last week. The Strategy will develop the foundations of a Resource for AI Science in Europe (RAISE) as a virtual institute that pools excellent talent, compute, data and research funding for AI. All those developments help the entire community to better leverage the massive flow of data and turn it into actionable knowledge.



But more needs to be done. The publication less than two weeks ago of the Europe's Environment Report 2025 by the European Environment Agency portrayed a bleak landscape of the state of the environment on our continent. While progress has been done on greenhouse gas emissions or air pollution, biodiversity and ecosystems, outlooks are not encouraging. Soil resources are under pressure, likewise water resources are becoming scarce, etc. All those red flags are calling for more decisive actions, preparedness, increase of our resilience or promotion of nature-based solutions.

There are however levers for change and reasons for hope. The Copernicus programme, its data and services constitute a world class capacity allowing the Union to have a leading role in observing and forecasting different environmental parameters. With new technologies developing at an amazing pace, in particular in the area of Artificial Intelligence, Digital Twins, cloud computing, there will be new opportunities to deliver Earth Intelligence, tailored to the needs of massive numbers of end users efficiently. The landscape analysis of partnerships, networks and projects conducted by the EuroGEOsec project quantified the construction of the EuroGEO community and mapped the overall contribution of the EC funded projects to GEO. Over the past 17 years, through the various framework programmes, GEO/EuroGEO benefit from a contribution of EUR 1.4 billion.

And this is not the end. The topic on "Delivering Earth Intelligence to accelerate the green and digital transition" attracts a dozen of very good proposals our colleagues from the Research Executive Agency started to evaluate. With the adoption of the last Work Programme of Horizon Europe in the coming months, new opportunities will become available with for example a call on "Interconnecting EO research for addressing environmental policies" or an open topic on "Developing Earth Intelligence solutions with observations and state-of-the-art AI for sustainable competitiveness and policy making".

In preparation of the next Multiannual Financial Framework, we have started working on the revision of the EO Strategic and Research Agenda your community will be asked to contribute to. It will help identifying our research priorities and set the scene for the next generation of research calls. The EuroGEO Action Groups have already been asked to identify the research gaps and to discuss them during this workshop. For instance, may I invite you to contribute to the public consultation on the European integrated framework for climate resilience that is expected in November 2025. Those are only a few examples on how we organise ourselves in Europe to design science-based policies.

But what about GEO itself. How can we secure the GEO initiative fulfils its promises, and deliver the Earth Intelligence it has committed to in its Post-2025 Strategy? Two weeks ago, as Lead co-chair of GEO, we called for an extraordinary meeting of the GEO Executive Committee. There was indeed an urgency not only to react to the recent geopolitical situation, the reform of WMO and their impacts on GEO, its secretariat, the work programme, its long-term sustainability. While some uncertainties remain, we are convinced that with the help of the Community, we can still secure a better future for GEO. Just look at the numerous examples listed in the Statements released ahead of the GEO Global Forum or at the richness of the GEO Work Programme we adopted at that occasion. This is what GEO is about, a rich and diverse community using to its best extent EO to address a huge range of issues.

Over the past two years, EuroGEO has progressed beyond our expectations. The implementation plan the consortium prepared with the whole community gives us clear directions. Discussions are taking place to prepare the next phase of EuroGEO, resources are mobilized from within the European Commission, and from the community. ECMWF is currently investigating the possibility to host the EuroGEO, which could be located in their premises in Bonn.

We are only at the beginning of a new adventure, and we count on you to support this effort as we have done on our side.

Thank you very much for your attention.



EuroGEO Workshop 2025 at a glance

The EuroGEO Workshop 2025 brought together the European Earth Observation (EO) community for three days of high-level exchanges, innovation, and collaboration at the “World Forum - The Hague”. Co-organised by the European Commission, the EuroGEO Secretariat and the Netherlands Space Office under the EuroGEOsec Project. The Workshop convened in 38 sessions in total with over 230 speakers, 105 presentations and 60 posters in front of an audience of more than 310 participants, representing European Commission, GEO Secretariat, regional GEO offices, Copernicus Services, entrusted entities, space agencies, research institutions and Universities, European projects, ministries and the private sector.



The EuroGEO Workshop 2025 gathered 318 participants.

The EuroGEO Workshop 2025 aimed to accelerate the delivery of Earth Intelligence by strengthening Europe's contributions to the GEO Work Programme, reinforcing the links to Copernicus, and aligning research, innovation, and national coordination with global and European priorities. The workshop's objectives were:

- Set a strategic vision for Earth Intelligence in Europe, engaging Copernicus, to connect policy drivers, user needs, and operational capabilities — including outcomes from the 2025 GEO Forum.
- Showcase European contributions to GEO focus areas, highlighting best practices and gaps in the alignment between GEO, Copernicus, Horizon Europe, and national programmes.
- Advance research and innovation for the downstream Earth Observation (EO) sector through structured sessions on the Copernicus SRIA, fostering community input, identifying partnerships, and defining investment and operational pathways.
- Mobilise EuroGEO Action Groups to deliver actionable priorities and recommendations for their respective domains, including contributions to the evolution of Copernicus Services and future R&I activities.
- Engage youth and startups, showcasing next-generation EO innovation and identifying how EuroGEO can better support emerging actors in the EO ecosystem.
- Strengthen national coordination and governance, through exchange on national GEO strategies, Joint Action Plans, and synergies between Member States and European programmes.

- Co-design the EuroGEO Implementation Plan, drawing on the outputs of each session to define strategic directions, community contributions, and mechanisms for sustained European impact within GEO.

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Advancing collective Earth Intelligence

#OneEuroGEO – One Voice

Europe's united contribution to GEO

Among the highlights of the Workshop was the Copernicus Satellite Photo Exhibition, *"The Earth from Above,"* presented at several open spaces of the "World Forum The Hague". The exhibition presented satellite imagery from the Copernicus Sentinel missions transformed into striking works of art, capturing the beauty, complexity, and fragility of our planet. Blending creativity with science, this unique showcase reflected how art can translate data into emotion and awareness, reminding participants of the profound connection between observation and inspiration. The EuroGEO Secretariat warmly thanks the European Commission's Directorate-General for Defence Industry and Space (DG DEFIS) for making this inspiring contribution possible.



Copernicus exhibition at World Forum The Hague.

1 Vision and Global engagement

The workshop opened with high-level remarks and a strategic plenary on the future of Earth Intelligence in Europe. Speakers outlined how policies, user needs, and operational capacities must come together to drive impact, building on the outcomes of the 2025 GEO Forum. In the afternoon, parallel thematic sessions explored Europe's contributions to GEO focus areas—from agriculture and climate to biodiversity, One Health, water, and disaster resilience. Discussions focused on aligning efforts, identifying gaps, and shaping concrete recommendations. The day closed with side events and a social gathering at the World Forum.

1.1 Opening Plenary

A panel of speakers opened the first day of the EuroGEO Workshop with high-level remarks on the future of Earth Intelligence in Europe. Speakers outlined how policies, user needs, and operational capacities must come together to drive impact, building on the outcomes of the 2025 GEO Forum.

- Harm van de Wetering, Netherlands Space Office Director
- Franz Immler, European Commission, DG RTD
- Michel Rixen, European Commission, DG DEFIS
- Sara Venturini, GEO Secretariat
- Thierry Ranchin, EuroGEO Secretariat/ARMINES

Starting with highlighted the importance of using Earth Observation (EO) data to address world problems, Harm, Director of the Netherlands Space Office, quoting Harti Hola, Director of UNOOSA, emphasized that the success of space is not about the number of launches or satellites in orbit, but rather about:

- How many farmers are helped to increase their yields, how many lives are saved from drowning, or how well forests are maintained — these are the kinds of goals the EU should focus on in the next five years.
- In the Netherlands, user uptake is a key priority. For 15 years, they have worked with five ministries — including the Ministry of Infrastructure and Water Management — as well as politicians, to promote EO uptake.

The Netherlands has built a strong community of innovators, researchers, and private sector actors. Dutch-developed EO applications serve local needs in Africa and Asia, fostering entrepreneurship and supporting community *engagement*, the main goal of this conference.

From the perspective of the European Commission, DG RTD, Franz Immler, Head of EO, shared the following key messages:

- Horizon Europe has invested around €650 million across 40 projects addressing topics that contribute to GEO. These projects offer a wealth of insights and demonstrate their potential to create real impact toward key policy goals such as the Green Deal, climate neutrality, and reversing biodiversity loss.
- EO private sector: There is a need to better valorize project outcomes and make them more visible.

- Over the Atlantic: Policies are influencing GEO. Within Europe, EuroGEO has greatly benefited from the EuroGEO Secretariat, which has done an excellent job and developed a new implementation plan.
- Looking ahead: The EuroGEOsec project is coming to an end, raising questions about the sustainability of this initiative. Research project funding alone is not sufficient — a more stable and long-term programme is needed to support EuroGEO.

To help the initiative move forward:

- The EuroGEOsec project will assign a Liaison Officer (40% position) to work closely with the JRC, EEA, and funded research projects under EuroGEO.
- An EuroGEO Workshop will be organized next year to showcase what has been elaborated and achieved.

From DG DEFIS, Michel Rixen provided the Copernicus overview. (At least five people in the audience were not familiar with Copernicus). The programme focuses on gathering user requirements from Member States, policymakers, and the European Commission, which then drive technological developments addressing key policy areas. These are not isolated policies but are aligned with the Sustainable Development Goals (SDGs) and the GEO Post-2025 Agenda.

Copernicus builds on decades of research and development — from the Baveno Manifesto, which set the initial vision, to the progression through research and technology readiness levels, leading to the operational phase of Copernicus in 2014 (starting with land management services). Today, Copernicus is fully operational and works in close cooperation with EuroGEO to develop and deliver cutting-edge services. It also remains a vital tool for the research community. The next Multiannual Financial Framework (MFF) will introduce Copernicus Version 3, beginning in 2026. The system consists of:

- A constellation of Sentinel satellites,
- An in situ component, and
- Contributing missions from partner programmes.

Key partners of this ecosystem: ESA, EUMETSAT, and the European Commission. They are preparing new exploratory missions, including Sentinels-4 and -5 focused on atmospheric monitoring. Copernicus data is accessible via platforms such as the Copernicus Data Space Ecosystem (CDSE) and WEKEO, which serve as interfaces for data access and thematic hubs (Arctic, coastal, energy, health). These hubs are transversal, cutting across multiple service domains rather than being tied to a single service. In total, Copernicus encompasses six core services, and the digital dimension — including AI, HPC, and big data — is rapidly expanding.

From the GEO Secretariat, Sara Venturini highlighted the dual engagement GEO-EuroGEO.

- This year's dual engagement between GEO and EuroGEO feels different as Europe embarks in a significant step forward. The GEO Global Forum annual event served as a milestone for the community, marking 20 years of GEO, the adoption of the Post-2025 Programme, and the path ahead.
- Europe's strong connection, particularly through the Netherlands, has played a key role in promoting EU leadership on open data principles, Copernicus, Horizon Europe, and other related initiatives.

- EuroGEO represents a model of partnership that combines top-down and bottom-up approaches, bringing together diverse ecosystems and aligning local actions with global objectives, reflecting GEO's own vision.
- The UK and other partners are actively supporting GEO, with their examples helping to shape and inspire further global discussions.
- The GEO Innovation Fund is fostering research-to-operation pipelines, where innovation emerges from the connection of ideas. The new GEO programme aims to strengthen both global and regional initiatives.

With final remarks, Pr. Thierry Ranchin recalled EuroGEO is a commitment from all communities. EO is for competition and innovation for Europe, what we are doing in this domain is bigger than us to build the future of EO and EuroGEO- SRIA AGs-earth intelligence and our collective intelligence.



1.2 The Vision for Earth Intelligence – From Policy to Impact

This session has set the strategic tone for the EuroGEO Workshop 2025 by presenting a shared vision of Earth Intelligence as a driver for policy design, implementation, and systemic change. It explored how European initiatives align with global frameworks and national needs.

1.2.1 Setting the scene, outcomes of the GEO Forum

1.2.1.1 Pr. Nicola Pirrone, National Research Council of Italy.

The GEO Forum demonstrated strong high-level commitment from GEO Member States to advance the GEO Post-2025 Strategy and its implementation. It gathered 729 attendees from 72 countries, including 10 ministers or equivalent representatives from 8 countries, 4 Director-Generals of regional intergovernmental organisations (three from the EC and one from SPC), and 1 UN Secretary General (Convention on Wetlands), ensuring high visibility and political engagement.

Key outcomes included strengthening links between political decision-makers and implementing actors, enhancing visibility of contributions from GEO Members and Participating Organisations (e.g. Copernicus, Horizon projects, national initiatives), and consolidating GEO's evolution from *data for all* to *earth intelligence for all*.

GEO Forum's objectives and conclusions focused on:

- Reinforcing national and European coordination and governance;
- Establishing a strategic vision for Earth Intelligence in Europe through dialogue with policymakers;
- Showcasing and scaling up European EO contributions and services;
- Advancing research, innovation, and the EO value chain;
- Mobilising EuroGEO Action Groups to define priorities and recommendations;
- Engaging youth and startups;
- Co-designing the EuroGEO Implementation Plan.



1.2.2 Delivering Earth Intelligence in Europe

To examine what is needed to deliver Earth Intelligence in Europe, focusing on the operational pipelines that connect research, policy, markets, and users. The session explored the main drivers of demand, the enabling conditions for EO-based solutions, and the support mechanisms available to move innovation into sustained use. After a brief introduction to the scope of the session and how it links with the EuroGEOsec project, one moderated panel discussion addressed the role of policy and demand in driving EO innovation, and the conditions for adoption and market uptake. Speakers shared concrete examples from their own organisations and reflected on how tools and initiatives can strengthen Europe's capacity to deliver Earth Intelligence. Audience views were collected through live polls and a closing Q&A helped to shape recommendations and a future "roadmap". *See audience feedback in Annex.*

1.2.2.1 Speakers

- Mark Dowell, European Commission's Joint Research Center (JRC)
- Weiyi Ding, City of Amsterdam
- Eduard Escalona, European Agency for the Space Programme (EUSPA)
- Alexia Freignaux, Space Climate Observatory (SCO)
- Sandrine Mathieu, ACRI ST
- Franka Kunz, European Space Agency (ESA), DestinE Service Platform (DESP)

1.2.2.2 Moderators

- Francesca Piatto, European Association of Remote Sensing Companies (EARSC)
- Lefteris Mamais, Evenflow

EuroGEO already contributes to GEO through knowledge and decision-making support for societal benefits. However, there is a gap where the existing research entities and infrastructure is not fully involved in GEO, or even EuroGEO. The challenge is to ensure all actors are involved in EuroGEO and GEO, and ensure the full participation of Horizon Europe relevant cluster programmes. EuroGEO has a lot to offer to GEO and to society, but we are not entirely there yet.

1.2.2.3 Policy and Demand as Drivers of Earth Intelligence

From DG JRC's KCEO perspective (Mark Dowell), the Space Programme regulation is explicit in the fact that Copernicus is user driven, with core users defined as policymakers in the EU institutions and member states. It is the needs of these core users that drive the evolution of the programme itself.

Over the last decade, there has been a transition: from 11 explicit references to Copernicus in EU legislation from 2015 to 2020, we can see 90+ explicit references in the 2020-2025 period. This stems from the maturity of the programme, but also a push coming from the twin transition (green and digital) and increasing awareness from European Commission DGs.

The focus in the coming years is on supporting the implementation phase of the legislation rather than on the proposal phase, although there are still regular mentions (e.g. water, ocean pact, climate adaptation, etc.). Looking forward, the EU's next MFF has continued this approach with all core elements still included in the proposal.

Therefore, we see that evidence-based policymaking acts as a driver of demand because EO provides objective traceable data, a European perspective (not just national level) and multiscale information (user level/ national/municipality), which allows us to connect the different data.

On the user side, we see that policy translates to daily urban management, which is done across a variety of departments and is very scattered. For example, for the municipality of Amsterdam (Weiyi Ding), they have several key needs for EO:

- Mobility and infrastructure: subsidence, construction, buildings (SAR)
- Energy transition: carbon neutrality, rooftop solar potential, wind turbine location & analysis
- Air quality: where the different pollutants (PM2.5, PM10, etc.) are coming from & how to tackle the emissions
- Health & management of urban green/blue areas: water, biodiversity (CLMS, Landsat)
- Urban heat islands: High-Res thermal images needed to pinpoint, green areas, etc.

But there are barriers to adoption:

- Digital: data fragmentation/integration – parallel to software use by asset managers (all together)
- Scalability: high resolution – scalability (improve resolution, very big challenge – cm by cm (current resolution are too low to incorporate in the strategy)
- Policy to practice: no funding (pilot to pilot) – no long-term solutions

From EUSPA's perspective, users' operational needs & challenges linked to policy implementation are key drivers: they create demand and are a great opportunity for the EO sector, as the main data providers for the sustainable transition. It is a demand-driven approach: provide solutions to address policies. To support this, EUSPA is demonstrating solutions to end users (e.g. through the implementation of proofs of concept).

From an EO service provider perspective, the policy-EO service provider "loop" can go both ways and that's why co-design is a great tool to address policy needs. The high-level policy framework (e.g. air quality in cities) needs to be anchored at the local level, addressing the local issues. Policy can act as a driver of demand, but EO service providers can also inform policy implementation/making (e.g. needs of users, needs across the departments - space as solution).

1.2.2.4 From Co-design to Market Adoption

From ESA and DestinE's perspective (Franka Kunz), co-design is key to engage with the users from the beginning in order to produce something useful. It is important to talk to the users, work with them and bring together different actors who don't necessarily know each other.

The SCO (Alexia Freignaux) has also put co-design at the centre of their work, developing solutions with end users, with the goal of turning scientific data into operational tools used by the end users and bridge the gap between science and policy. As such, all SCO projects include partnerships between the end user, the EO private sector and the research centres.

Sandrine Mattieu, from ACRI-ST mentioned that the main challenge is economic: during the project, test users are financially supported, but once the project ends, there is no funding to continue. It's difficult to understand the market and determine which business model to apply. The key issue is bridging the gap between the technical value of the solution and its economic value.

As a next step, open and reliable access to data, for example through the CDSE, is a huge advantage and necessary starting point. However, for co-design, it's not just EO data that are needed, other data are

needed, as well as the right tools to scale, training materials/documentation. This has been the approach taken in the DestinE platform.

When it comes to market uptake, EUSPA (Eduard Escalona) has seen that the technology is mature, but solutions are generally not fit-for-purpose. Before, it was about awareness (explaining what could be done with space-based solutions), but once end users know the potential, they want to see every solution in their own setting, addressing their own challenges, which generally also entails the need for multidisciplinary solutions. EUSPA, therefore, supports this need with “proofs of concept”: starting with the users, they show how they could do things better with space solutions (showing the value in economic terms), within the users’ own environment, own data, own workflows. This way, they understand the real value of the solutions, ensuring uptake. On the other hand, in order to scale up, the focus should be on the demand; there is a need to standardise the demand, to be able to replicate the offer, otherwise it’s not scalable.

1.2.2.5 Delivering Earth Intelligence in Europe: Specific recommendations to EuroGEO

1.2.2.5.1 EuroGEO Action Groups

EuroGEO Action Groups can act as the last mile to downstream applications: key competence base to deliver the last mile, address recurrent need of supporting policy making, remain state of the art, reinforce the value chain. They can also support the KCEO in scaling up the understanding of how to address policymakers' needs.

1.2.2.5.2 EuroGEO as key coordination body

EuroGEO can bring together all the interlocutors: users, European institutions, research, private sector, etc., to have a single voice for the European EO sector. It is also a key platform to strengthen links with the European EO community (e.g., SCO that has an international focus, by engaging in EuroGEO can have that needed link to the European community).



1.3 European Contributions to GEO Focus Areas

A set of parallel sessions highlighting European leadership and contributions to GEO's global focus areas, showcasing how EU and national initiatives are supporting the GEO Work Programme. Through parallel thematic discussions, participants will exchange best practices, identify synergies, and explore gaps in coordination or delivery. The session aims to collect concrete recommendations for better aligning Copernicus, Horizon Europe, and national GEO activities with GEO's priorities, generating actionable inputs for the EuroGEO Implementation Plan to strengthen Europe's global engagement.

1.3.1 Agriculture & Food Security

1.3.1.1 Moderator

- Sven Gilliams, GEOGLAM

1.3.1.2 Speakers

- Michele Meroni, European Commission's Joint Research Center (EC JRC), MARS
- Steven Wonink, eLEAF, WaPOR
- Jeroen Degerickx, Flemish Institute for Technological Research (VITO), WorldCereal

1.3.1.3 Session overview

This session objective is highlighting European leadership and contributions to GEO's global focus areas, showcasing how EU and national initiatives are supporting the GEO Work Programme, and in particular GEOGLAM. The session aims to collect concrete recommendations for better aligning Copernicus, Horizon Europe, and national GEO activities with GEO's priorities, generating actionable inputs for the EuroGEO Implementation Plan to strengthen Europe's global engagement.

Sven Gilliams (GEOGLAM) opened the session by providing the policy perspective and G20 Declaration from which GEOGLAM was launched in 2011. Under GEOGLAM information, tools and capacity building is provided on Early Warning and Food Security, Market Information, Adaptation and Mitigation. R&D coordination to design Essential Agricultural Variables (indicators) is ongoing, e.g. at recent workshop at EC-JRC (Ispra). This coordination activity is partially funded by UK. GEOGLAM Crop Monitor reports monthly (by consensus) on the agricultural conditions and covers 97% of global agriculture production.

The Joint Experiment for Crop Assessment and Monitoring (JECAM) is also a GEOGLAM activity and it provides a global network of voluntary research sites. The overarching purpose of JECAM is to compare data and methods for crop area, condition monitoring and yield estimation, with the aim of establishing 'best practices' for different agricultural systems. Activities are funded in kind by participating organizations, often financed from national and/or European R&D funding.

GEOGLAM requirements supported the development of the ESA LTSM mission. The European Union (EU) is a big contributor to GEOGLAM. Copernicus data is being used in most of the GEOGLAM applications, EU is the frontrunner in data sharing. Not all countries openly share data, e.g. data of China is not shared globally, even also not nationally.

Michele Meroni (EC-JRC) presented the JRC (European) contribution to GEOGLAM, namely the Anomaly hotSpots of Agricultural Production (ASAP) Early Warning system and the Copernicus4GEOGLAM Copernicus service. ASAP provides automatic agriculture warnings every ten days and it is used by JRC analysts for the JRC contribution to the GEOGLAM CM4EW bulletins. Copernicus4GEOGLAM service provides baseline crop type mapping and crop area estimate to support national & regional agriculture

monitoring, planning and early warning. Recently, the service was extended to cover EU Deforestation Regulation validation activities. Copernicus4GEOGLAM is an ad hoc service requested by GEOGLAM partner countries active since 2021 (eight countries covered so far). The service includes the deployment of large field campaigns to collect ground truths. For both ASAP and Copernicus4GEOGLAM, all referenced data and output information can be freely downloaded.

Steven Wonink (eLEAF) presented the FAO WaPOR services for Agriculture and Water management. WaPOR contributes to SDG target 6.4 by monitoring water-use efficiency in agriculture on a global scale. Aim of WaPOR is to assist countries in monitoring water productivity, identify water productivity gaps and propose solutions for improvement. WaPOR data is well suited for irrigation monitoring and pilots are ongoing to assess its potential for irrigation planning. The program started in 2015 and is funded by the Ministry of Foreign Affairs of the Netherlands. eLEAF delivers all data products, based on the open-source WaPOR-ETLook model, to the portal, developed and operated by FAO. An easy-to-use dashboard gives access to the data and documentation, including a catalog of (80+) applications and use cases. The service is scientifically validated by IWMI, IHE and ITC.

Jeroen Degerickx (VITO) presented the ESA WorldCereal project. The project contributes to GEOGLAM with cropland and crop type products for a variety of cereal crops, and an in-situ data base. WorldCereal provides ready to use products, but also a system to develop a monitor product yourself, based on CDSE and OpenEO.

1.3.1.4 Discussions

Discussions were around two topics:

- a) what further R&D and scale up is needed
- b) how to coordinate, embed and finance future operations?

The role of GEOGLAM as a globally coordinating entity for research and capacity building for agriculture and food security is evident. The presentations today demonstrated well how European funded projects (EC, ESA, and others of course as well) are contributing to GEO research objectives. Firstly, current use of satellite and in-situ data are generating new global and regional information products that become available for society. Algorithms and source codes are open and freely available. This usage brings new insights and generates new research questions. Secondly, in the next decade new satellite sensors and/or better spatial/temporal resolutions will become available. This will also gear new research. GEOGLAM is very well positioned to coordinate this globally. The Action Group Agriculture and Food Security is very well positioned to coordinate an European roadmap for research and development on this topic. In order to be effective a strong collaboration between GEOGLAM and the Action Group is required.

The issue of organizational and financial sustainability of (newly developed) services is very relevant. European research organization and GEOGLAM partners do not have a mandate and finance to provide operational services on agriculture and food security. Intergovernmental (e.g. FAO, EC JRC, EC EEA) and national (e.g. national statistical offices, USDA) organizations have such mandates. Outcomes of EC and ESA funded projects includes improved and new algorithms and validated information maps on agriculture and food security. The uptake of these results into operational services is often not part of these projects. GEOGLAM partners cooperate in delivering monthly reports build on consensus.

FAO WaPOR and JRC Food Security Unit deliver operational services by mandate. JRC delivers monthly bulletins for Europe operates a global Early System, both contributing to GEOGLAM CM4EW. JRC is also running the EC4GEO project (Prototyping EC policy-driven EO service for addressing global challenges and supporting EuroGEO, contracted by DG RTD) which specifically includes scientific support to GEOGLAM. FAO operates the near real-time WaPOR database using satellite data that allows the monitoring of agricultural water productivity at different scale and its version 3 is also available at Google Earth Engine.

Both services are organizationally embedded in mandated organizations. Via the Copernicus program the EC will also contribute to FAO WaPOR by delivering global data at 300m scale. Discussion between FAO and the Netherlands government are ongoing to enhance FAO WaPOR with higher resolution data (100 and 30m) for specific countries and regions.

GEOGLAM supports developing countries on developing national crop monitors, amongst other via National Adaptation Plan. Procurement of infrastructure and future operations can be included as activities in these NAPs. These activities are project funded. EU Digital Gateway might also provide funding for national operational services in regions of the world (Africa & MENA, APAC, LAC).

1.3.1.5 Specific recommendations to EuroGEO

The presentations and discussions clearly outline a need for a strong European coordination of R&D for monitoring agriculture and food security with Earth Observation and a close collaboration with other actors as facilitated by GEOGLAM. The Action Group Agriculture & Food Security is well placed to support EC RTD.

An early and stronger emphasis on identification and communication with mandated organizations could help increase of the uptake of the R&D results and developed services. European Union could support ongoing projects on this process via offering an expert pool. By bringing in independent experts, tunnel vision is avoided, and synergies with other organizations and/or activities can be identified.



1.3.2 Ecosystems, Biodiversity and carbon management

1.3.2.1 Speakers

- Sara Venturini , GEO Secretariat, THE ATLAS
- Antonello Provenziale, National Research Council of Italy (CNR), GEO-MOUNTAINS
- Carolina Adler, University of Bern (UniBE), GEO-MOUNTAINS

1.3.2.2 Session overview

The session consisted of two presentations:

1.3.2.2.1 *Global Ecosystems Atlas (Sara Venturini, GEO Secretariat)*

The presentation introduced the Global Ecosystems Atlas, designed to address major gaps in global ecosystem data by combining existing national/subnational maps with new AI-based mapping using Earth observation and local knowledge. The Atlas has two main components: integrating existing maps into a consistent global synthesis, and generating new global maps through spatial modelling.

Progress to date includes a proof-of-concept with 14 national maps, development of a global training dataset, a catalogue of ecosystem data, and a technical pipeline enabling regular updates. A global synthesis map covering 110 ecosystem types is planned for Q4 2026. Future directions include finer ecosystem classifications, ecosystem condition monitoring, and citizen-science integration. Opportunities for EuroGEO include contributing national datasets, supporting EU classification alignment, and engaging in collaborative mapping efforts.

1.3.2.2.2 *GEO Mountains Initiative (Carolina Adler & Antonello Provenziale)*

The presentation outlined the work of GEO Mountains, a GEO Initiative focused on improving access to multi-disciplinary mountain data and supporting climate, water, ecosystem, and adaptation assessments. Current efforts—supported by the Swiss SDC Adaptation at Altitude Programme—target data gaps in major mountain regions and involve capacity-building workshops, youth engagement, and contributions to GEO's post-2025 work programme.

From 2026–2028, GEO Mountains plans to expand observation inventories, develop a Virtual Research Environment, produce assessment-ready information for processes such as IPCC AR7, and strengthen global community engagement. Opportunities for collaboration with EuroGEO include data integration with Copernicus/ECMWF, participation in European regional initiatives, and scaling up GEO Mountains outputs for wider use.

1.3.2.3 Discussions

The discussion explored how GEO data initiatives can better support policy, decision-making, and environmental monitoring. Participants highlighted interest in connecting Earth observation with biodiversity, pollution, and freshwater management, and raised broader concerns about data discoverability and the policy uptake of ecosystem information.

Following the GEO Mountains presentation, participants noted that while mountain regions generate significant scientific data, much of it remains difficult to access due to inconsistent standards, limited data sharing, and uneven regional coverage. Biotic observations were identified as particularly sparse compared to climate measurements. The need for stronger European coordination, sustained funding, and integration with hydrological assessments (especially concerning glacier melt and downstream water availability) was emphasised.

In discussion of the Global Ecosystems Atlas, participants focused on the future evolution of the platform. There was strong interest in incorporating ecosystem condition, temporal dynamics, and transitional ecosystem types. Venturini noted these elements are planned but will follow the establishment of global, harmonised extent maps. Participants also raised the importance of transparent data models, links to national reporting needs, and potential inclusion of urban environments, though current complexity limits the latter. Overall, the discussion underscored the value of aligning European ecosystem classification efforts with the Atlas and encouraging countries to contribute national mapping initiatives.

1.3.2.4 Specific recommendations to EuroGEO

- Improve coordination and data-sharing standards across Europe to make mountain and ecosystem datasets more accessible and interoperable.
- Support long-term sustainability of GEO Mountains and Atlas outputs, including continued funding and technical maintenance.
- Strengthen integration of climate, hydrology, and biodiversity data to address policy needs (e.g., freshwater availability, ecosystem change).
- Facilitate development of future capabilities such as ecosystem condition metrics and time-series monitoring.



1.3.3 Climate, Energy and Urban

Showcasing EU and national initiatives that support the GEO Work Programme and its contributions and needs. Detailing common areas and explicit differences in the Urban area. The discussions aim to exchange best practices, identify synergies and gaps, and produce recommendations for better alignment between Copernicus, Horizon Europe, and national GEO activities.

1.3.3.1 Moderator

- Thierry Ranchin, MINES Paris PSL

1.3.3.2 Speakers

- Massimo Menenti, Delft University of Technology (TU Delft), GEOCRI
- Michele Melchiorri, European Commission – Joint Research Centre (EC JRC), HUMAN-PLANET
- Jan Rene Larsen, Arctic Monitoring and Assessment Programme (AMAP)/SAON Secretariat, ARCTIC-GEOSS
- Martyn Clark, GEO Secretariat, GHRS
- Mark Noort, HCP International, TEMBO Africa
- Eleni Athanasopoulou, National Observatory of Athens (NOA), GEONICE
- Iphigenia Keramitsoglou, National Observatory of Athens (NOA), GEONICE
- Evangelos Gerasopoulos, National Observatory of Athens (NOA), UHCO

1.3.3.3 Session overview

Thierry Ranchin opened the session by presenting the progressive maturity model for GEO activities—from pilot projects through initiatives, flagships, and mature flagships—illustrating how European Earth Observation (EO) efforts evolve toward operational and global relevance. He emphasized the importance of coordination and synergy across initiatives to strengthen Europe's contribution to GEO's global agenda and to align Copernicus and Horizon Europe activities.

The session explored how EO supports Climate, Energy, and Urban challenges, focusing on user-oriented approaches, data openness, and co-design with stakeholders to ensure actionable policy outcomes.

1.1.1.1 Discussions

Massimo Mementi (GEOCRI) presented advances in applying Artificial Intelligence (AI) to enhance datasets in cold regions, improving coverage and interpretation where traditional observations are limited. He stressed that AI remains a work in progress—its reliability and validation must be strengthened before full operational use. His intervention underscored the need for continuous research and integration of AI with EO and in-situ data.

Michele Melchiorri (GEO Human Planet) brought the human dimension to EO, emphasizing that data should directly support policy implementation, monitoring, and validation. He highlighted the importance of open and free data and warned that cultural and institutional differences across Europe still challenge open data practices. Key topics included urban population mapping, night-time lights, and urban vulnerability. Michele called for keeping the population impact central, ensuring EO contributes to better lives and sustainable urbanization.

Martyn Clark (Global Heat Resilience Service, GHRS) introduced the Space4Cities initiative and the Global Heat Resilience Service, aimed at addressing urban heat stress and supporting climate action at the city level. The GHRS, currently in its pilot phase (2025–2027), will focus on data provision, communication, and design for practical use by local authorities and the Global Covenant of Mayors for Climate & Energy. Martyn emphasized co-design and delivery, ensuring services meet the needs of end users.

Kaisa Juhanko (Arctic-GEOSS) discussed the Arctic's rapid environmental changes, including melting ice, flooding, and urban damage. She highlighted that “urban” has different meanings across Europe—a Finnish town faces different challenges than a Mediterranean city. Kaisa called for codesign with end users, including scientists, local inhabitants, and Indigenous communities, and urged attention to less common urban forms that still experience significant impacts. Her message: context matters, and definitions of “urban” must remain inclusive yet comparable.

Mark Noort (Tembo Africa) emphasized the coexistence of satellite and in-situ data, promoting modular, building-block solutions that can be easily adapted to different regions rather than redeveloped from scratch. He highlighted the value of affordable and long-term data availability and the need to collaborate, not compete, with local data providers. Mark's examples illustrated how ground-level instruments and open data can foster innovation and local implementation.

Evangelos Gerasopoulos (UHC0) addressed the urban impact of climate change on heritage buildings, a topic often overshadowed by focus on natural ecosystems. He advocated for data collection, sharing, and visualization to raise public awareness and support preventive conservation of cultural heritage. Evangelos noted that aligning with the Sustainable Development Goals can help shift focus toward public engagement and tangible local impacts.

Iphigenia Keramitsoglou (GEONICE) called for strengthening open data, open software, and accessibility, enabling EO research to transition from experimental to operational stages. She emphasized co-creation and stakeholder consultation, especially across diverse urban contexts such as coastal cities affected by sea-level rise. She underscored the importance of comparability of urban areas, integration of policy frameworks, and connection to initiatives such as smart cities, heritage protection, and digital twins. Participants also discussed the importance of policy linkages, ensuring that EO data directly informs urban planning, resilience strategies, and decision-making.

Throughout the discussion, speakers and participants consistently returned to three shared priorities:

- **Openness and Accessibility:** A universal call for open data policies and long-term sustainability, acknowledging that governance and culture influence implementation.
- **Co-Design with Users:** Strong emphasis on involving end users—from local authorities to citizens—throughout project lifecycles to ensure usability and impact.
- **Integration Across Systems:** Agreement that EO, AI, and in-situ data must complement each other; duplication of efforts should be avoided through better coordination and shared learning.

1.3.3.4 Specific recommendations to EuroGEO

- Strengthen coordination among Copernicus, Horizon Europe, and national GEO initiatives.
- Develop user-driven, co-designed services for cities and local decision-makers.
- Promote AI integration with validated data pipelines to enhance operational EO capacity.
- Ensure open and long-term data accessibility, addressing governance and cultural barriers.

- Harmonize urban definitions and typologies while respecting local diversity.
- Link EO insights to policy frameworks supporting climate resilience, urban planning, and heritage protection.
- Build on cross-sectoral initiatives such as Destination Earth, 100 Smart Cities, and the Climate-Energy-Urbanization Nexus Hubs.



1.3.4 Water and Land Sustainability

Water and land systems underpin food security, biodiversity, and climate resilience. Monitoring their condition and sustainable use is essential for achieving SDGs 6, 13 and 15 and implementing the EU Green Deal. The session explored how EO can enable more integrated approaches across these domains.

1.3.4.1 Moderator

- Veronika Kopačková-Strnadová, Czech Geological Survey (CGS),

1.3.4.2 Speakers

- Antje Hecheltjen, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), GEO-LDN (Land Degradation Neutrality)
- Ghada El Serafy, Deltares, GEO AquaWatch
- Veronika Kopačková-Strnadová, Czech Geological Survey (CGS), GEO-MIN

Each of the three speakers presented their initiative, followed by an interactive Q&A with participants. The discussion explored synergies between projects, opportunities for cross-sectoral collaboration, and mechanisms for improving user engagement and policy relevance of Earth Observation (EO) activities.

1.3.4.3 Session overview

This session focused on how different initiatives and expertise contribute to GEO's Water and Land Sustainability focus area, highlighting linkages between land, water, and resource use, and their role in achieving environmental and societal resilience.

The goals were to:

- Present current GEO Flagships and Initiatives addressing land degradation, water quality, and sustainable resource management.
- Identify collaboration gaps and opportunities between GEO initiatives, EuroGEO Action Groups, and related communities.
- Formulate recommendations for inclusion in the EuroGEO Implementation Plan.

1.3.4.4 Discussions

1.3.4.4.1 Antje Hecheltjen, GEO-LDN (Land Degradation Neutrality)

GEO-LDN operates under the UNCCD framework to support countries in monitoring and managing land degradation (SDG 15.3.1). It focuses on three actions — monitor, avoid, restore — using three Essential Variables: land cover, soil organic carbon, and land productivity.

The LDN Toolbox provides user-oriented guidance across the land-use planning cycle, supported by e-learning and global/regional stakeholder networks.

- European support is led by Germany (GIZ Secretariat, 2022–2026) with calls for further partner contributions.
- Discussion highlighted the need for stronger links with other GEO activities and validation of restoration data; however, LDN's current mandate does not cover project verification.

1.3.4.4.2 Ghada El Serafy, GEO AquaWatch, Deltares

GEO AquaWatch aims to build global capacity for EO-derived water quality data, products, and information. Its activities bridge in situ observations, 3D predictive modelling, and satellite monitoring of inland and coastal waters.

The initiative has multiple working groups, including a MAGIK Indigenous Network and an Early Career Society, ensuring broad participation and user-oriented development.

Key activities include production of global water quality maps, validation tools, and best-practice guidance (e.g. through the GLASS project).

Key discussion points:

- Strong emphasis on user needs and uptake, rather than science-driven outputs.
- Recognition of the link between water quality and quantity; Satellite observations must be complemented by modelling and in situ measurements.
- Opportunities for increased collaboration with other GEO initiatives, particularly GEO Mountains, Blue Planet, and biodiversity networks.
- Participants complimented AquaWatch's strong engagement of early-career scientists.

1.3.4.4.3 Veronika Kopackova-Strnadova , GEO-MIN

GEO-MIN explores EO applications in the mining sector, focusing on multi-scale monitoring using drones, aerial data, and satellite EO (including Copernicus and hyperspectral missions such as EnMAP, PRISMA, and CHIME). The initiative supports environmental monitoring, risk mitigation, and the development of open spectral libraries and analytical dashboards for mining stakeholders.

Case studies were presented from Europe, Africa, and Asia, demonstrating how EO can enhance environmental oversight in mining operations.

Discussion noted:

- The strategic importance of mining for Europe's Critical Raw Materials Act.
- The regulatory and cultural barriers to EO adoption by mining companies.
- Need for leadership in ethical and transparent environmental monitoring.

1.3.4.5 Discussion Highlights

- Integration and cross-domain cooperation emerged as a recurring theme. While GEO-LDN, AquaWatch, and GEO-MIN each address distinct sectors, participants called for more systematic interaction between water, land, and resource initiatives.
- User engagement was emphasized across all presentations: both AquaWatch and LDN are shifting toward participatory and demand-driven approaches.
- There was recognition that EO alone cannot capture all relevant variables (e.g., water chemistry, soil health), highlighting the need for hybrid approaches combining EO, modelling, and in situ data.

- Participants stressed the importance of capacity building and education, particularly involving early-career scientists and regional actors in data production and use.
- European actors were urged to strengthen their in-kind and technical contributions to GEO flagships.

1.3.4.6 Specific recommendations to EuroGEO

1.3.4.6.1 Foster cross-initiative collaboration

- Establish formal links between GEO-LDN, GEO AquaWatch, GEO-MIN and others under the Water and Land Sustainability theme.
- Encourage shared working groups or joint pilot projects on land–water interactions, including impacts of mining and restoration activities.

1.3.4.6.2 Enhance user integration and capacity building

- Expand training, e-learning, and user engagement mechanisms, building on the models of LDN and AquaWatch.
- Prioritize engagement of early-career professionals and local/regional decision-makers.

1.3.4.6.3 Strengthen contributions and coordination

- Increase in-kind contributions from (European) partners to GEO Flagships and Initiatives.
- Leverage Copernicus and national datasets to enhance global GEO services.

1.3.4.6.4 Advance validation, transparency, and accountability

- Develop mechanisms to verify reported restoration or monitoring outcomes (e.g., through cross-referenced EO products).
- Promote open access to spectral libraries and validation datasets.

1.3.4.6.5 Support data integration across domains

- Develop frameworks linking EO-based indicators for land degradation, water quality, and resource extraction impacts into a unified sustainability monitoring approach.

1.3.4.6.6 Align with European and global policy frameworks

- Ensure GEO contributions directly support implementation of the EU Green Deal, UNCCD, SDG 6 & 15, and the Critical Raw Materials Act.



1.3.5 One Health, Weather, Hazards, and Disaster Resilience

1.3.5.1 Speakers

- Fernando Sedano, European Commission Joint Research Centre (EC-JRC), Global Wildfire Information System (GWIS)
- Sergio Albani, European Satellite Centre (SatCen), Space & Security
- Sergio Cinnirella, National Research Council of Italy (CNR), GOS4M

1.3.5.1.1 *Fernando Sedano, Global Wildfire Information System (GWIS), European Commission Joint Research Centre (EC-JRC)*

GWIS is a global system monitoring wildfires using satellite data and modeling tools. It originated from the **European Forest Fire Information System (EFFIS)**. It focuses on wildfire early warning, monitoring, forecasting, and risk assessment. GWIS covers 43 countries, and works in collaboration with Canadian wildfire system, national civil protection agencies, and research bodies. It provides:

- Fire Danger Forecasting: 8 updates/day, providing near-real-time info.
- Long-term wildfire forecasts and early warning systems.
- Data sources : MODIS, Sentinel-1, Sentinel-2, Landsat 8/9.
- Burned area maps at 30m resolution with 3-day revisit time.
- Carbon emissions tracking via GFAS (Global Fire Assimilation System).
- EFFIS Decision Support System (DSS): simulates fire spread and behavior.

One use Cases include Bolivia 2024 (25 Sept): Forest fires as primary driver of deforestation in the Amazon. Coordinated with EU Delegation, IDB (Inter-American Development Bank), and World Bank. Supported by the Expert Group on Forest Fires in Latin America and the Caribbean (EGFF LAC).

1.3.5.1.1.1 Technology Roadmap

- Integration with EUMETSAT MetImage (pre-launch phase).
- Potential WiFi wildfire monitoring network in Canada, projected EU adoption by 2030.
- Emphasis on high-resolution satellite monitoring without traditional downscaling errors.

1.3.5.1.2 *Sergio Albani, Space & Security, EU Satellite Centre (SatCen)*

The Space & Security – Earth Observation for Disaster Resilience leverages Earth Observation (EO) for Food security; Water security; Climate security. It supports EU's foreign & security policy decisions.

1.3.5.1.2.1 Pilot presentation. Climate & Water Security – Pakistan

- Technology: DInSAR (Differential Interferometric Synthetic Aperture Radar) using Sentinel-1.
- Issue: Land subsidence due to over-extraction of groundwater.

- 70% of water-related damages are linked to subsidence.
- Informed by World Bank methodologies.

1.3.5.1.2.2 Pilot presentation. Critical Infrastructure – Ecuador

- Monitors land movement affecting metro infrastructure.
- Seeks to embed EO data into policy and spatial planning.

1.3.5.1.2.3 From Research to Action

- Promoting cross-domain EO-based R&I (Research & Innovation).
- EO processes developed under ATLANTIS Project for protecting infrastructure.
- Results fed into the GEO-DAMP platform for disaster management and resilience.

1.3.5.1.2.4 Strategic Questions

- How to bridge EO technology and emergency/security operations?
- Commercial interest: SatCen highlights a quick return on EO investments.
- Future GEO-hazard monitoring: interest in earthquake and landslide EO projects

1.3.5.1.3 *Sergio Cinnirella, GOS4M, Italian National Research Council (CNR)*

ONE HEALTH promotes an integrated approach to human, animal, and environmental health. Linked to the exposome concept (total environmental exposures throughout life). It promotes resilience structures in Europe and globally.

GOS4M (Global Observation System for Mercury) is a flagship Initiative under GEO. It seeks to provide actionable data to assess and mitigate mercury and other pollutant impacts globally. It ensures interoperability across international monitoring systems. It originated from policy needs (e.g., Minamata Convention on mercury pollution). Builds simplified data value chains for policy makers.

1.3.5.2 Action Groups & Cross-Thematic Integration

- Promote cross-thematic action groups within GEO.
- Encourage integration across climate, health, security, and ecosystem domains.
- Importance of interoperability, stakeholder engagement, and innovation-to-policy pathways.

1.4 Technical sessions

1.4.1 In situ technologies for hard to reach or under sampled areas: the benefit and challenges of low-cost sensors.

The session brings together seven Horizon Europe projects that focus on developing new technologies and covering gaps in-situ data. The projects will first take stock of the progress and challenges in optimizing technologies and adapting them to specific environments or extreme conditions and hard to reach/under sampled areas. Secondly, the projects will explain how these in-situ sensors and integrated systems are combined with other data (e.g. Copernicus services) towards operational monitoring. The projects will also share challenges linked to validation, interoperability and synchronisation between in-situ and other networks. Finally, there will be a roundtable and interactions with the audience dedicated to users' needs and future exploitation, including commercialisation and sustainability after the EU Horizon funding.

This session was complementary to the session “*Empowering Europe’s competitiveness through in-situ data*” organised by the European Environment Agency (EEA)

1.4.1.1 Moderators

- Erwin Goor, European Commission, Research Executive Agency (REA)
- Gaelle Le Bouler, European Commission, Research Executive Agency (REA)

1.4.1.2 Speakers

- Maria Jose Escorihuela, isardSAT, UAWOS
- Tuan Vu Cao, The Climate and Environmental Research Institute (NILU), MISO
- Mikhail Sofiev, Finnish Meteorological Institute (FMI), SYLVA
- Georgio Tsimiklis, Institute of Communication and Computer Systems (ICCS), Cirocco
- Isabelle Picard, Flemish Institute for Technological Research (VITO), ScaleAGData
- Luca Belelli Marchesini, Fondazione Edmund Mach, REMOTREES
- Nick van de Giesen, TU Delft, TEMBO Africa

1.4.1.3 Session overview

1.4.1.3.1 Erwin Goor (REA) Introduction of the session

The upcoming session on in-situ technology and sensor networks will explore forward-looking developments shaping Europe’s environmental observation landscape. Discussions will focus on reducing costs for equipment, deployment, and maintenance, while expanding geographical coverage and ensuring long-term data continuity. Participants will also address progress and challenges related to validation, interoperability, and synchronization between in-situ networks and remote sensing systems, aiming to enhance data integration and reliability. In addition, the session will consider new in-situ technologies designed for remote or under-sampled regions, as well as initiatives like ScaleAgData, which demonstrate how real-time sensor data can be scaled up for EU-wide agricultural and environmental monitoring. Finally, the discussion will examine future pathways for meeting users’ needs and ensuring long-term

sustainability and commercialisation of observation systems beyond EU Horizon funding, reinforcing Europe's leadership in open, integrated environmental data infrastructures.

1.4.1.3.2 *Maria Jose Escorihuela, isardSAT, UAWOS*

1.4.1.3.2.1 Topic:

Development of unmanned Airborne Water Observing System

1.4.1.3.2.2 Summary:

The project aims to advance UAS-based hydrometry as a modern, reliable solution for river monitoring in hard-to-reach regions such as arctic, alpine, and tropical environments. It will focus on developing innovative drone payloads equipped with radar altimetry, Doppler radar and laser, sonar, and water-penetrating radar to enhance the precision of in-situ measurements. The project also seeks to establish high-resolution, contactless airborne mapping workflows capable of capturing water surface elevation, riverbed geometry, flow velocity, and discharge along river systems. Another key objective is to validate and improve satellite-derived water level observations from Copernicus water services and missions such as Sentinel-6, ICESat-2, and SWOT, ensuring greater data accuracy and integration. Through practical demonstrations, the initiative will showcase the value of UAS hydrometry datasets for climate change adaptation, flood risk assessment, and environmental surveillance, ultimately positioning UAS hydrometry as a standard ("new normal") technology for in-situ river monitoring in challenging and remote locations.

1.4.1.3.2.3 Cost:

The cost of the system is around 1000€

1.4.1.3.2.4 Validation, interoperability and EO synchronisation:

Complement Copernicus Water service and other EO base service with UAS altimetry measures which can be deployed along the exact ground track and at the time of satellite overpass.

1.4.1.3.2.5 Sustainability and Key Exploitable Results:

Several SME's are part of the project and the selling of the payloads is foreseen but as well data and services.

1.4.1.3.3 *Tuan Vu Cao, The Climate and Environmental Research Institute (NILU), MISO*

1.4.1.3.3.1 Topic:

Autonomous Multi-Format In-Situ Observation Platform for Atmospheric Carbon Dioxide and Methane Monitoring in Permafrost & Wetlands

1.4.1.3.3.2 Summary:

The project focuses on the development of three autonomous observatories designed to enhance greenhouse gas (GHG) monitoring in challenging environments such as the Arctic and wetlands. The first, a static observatory for continuous ambient GHG monitoring, measures gas concentrations in the air, providing consistent background data. The second, composed of GHG flux chambers with edge intelligence, captures gas fluxes directly from sources, offering detailed insight into emission dynamics. Complementing these, a UAV-based observatory ("drone-in-a-box" system) with onboard processing capabilities is used to map spatial variability of gas concentrations and fluxes, identifying and monitoring emission "hotspots." Collectively, these systems aim to expand the geographical coverage of in-situ GHG observations and ensure long-term, high-resolution time series, supporting more comprehensive environmental monitoring and climate research.



1.4.1.3.3.3 Cost:

The cost of the solution's products ranges between 400€ to 1000€

1.4.1.3.3.4 Validation, interoperability and EO synchronisation:

Use of the in-situ observation from the low-cost sensors using gap filling techniques to improve reliability of satellite data measuring methane. Results are aligned with FAIR principles.

1.4.1.3.3.5 Sustainability and Key Exploitable Results:

The environmental monitoring market, particularly for greenhouse gases, remains limited for commercialization as it primarily relies on public funding and institutions. However, there is potential for expansion into other application domains, such as agricultural reporting and sustainability monitoring. There is growing interest in purchasing greenhouse gas sensors, but a sensor alone is not sufficient. Effective monitoring requires a complete system that includes data models, processing tools, and visualization capabilities. Such systems should be easy to use, minimize expert intervention, and allow users to customize and operate them independently, reducing reliance on scientists for setup and interpretation.

1.4.1.3.4 *Mikhail Sofiev, Finnish Meteorological Institute (FMI), SYLVA*

1.4.1.3.4.1 Topic:

A System for Real-Time observation of Aeroallergens

1.4.1.3.4.2 Summary:

The project aims to deliver a radical improvement in the temporal resolution, timeliness, coverage, and availability of bioaerosol information, addressing a major gap in atmospheric and environmental observation. Bioaerosols, which include airborne biological particles such as pollen, spores, and microorganisms, are recognized as key indicators and modulators of climate change, influencing both human and plant health and playing a critical role in ecosystem dynamics. The SYLVA project combines cutting-edge technological innovation with the development of new infrastructure, data distribution systems, and stakeholder engagement pathways to ensure that the solutions are adopted, sustained, and integrated beyond the project's lifetime. Designed for operation under extreme environmental conditions—including the Arctic, the Alps, and subtropical regions—SYLVA represents a significant step toward a more comprehensive, resilient, and sustainable bioaerosol observation framework in support of climate and environmental research.

1.4.1.3.4.3 Cost:

The cost of an in-situ sensor is around 60K€ with additional expense for data storage and maintenance around 60k€ to 70€ per year. EDNA analysis costs €50 per sample analysis which is something like five times less than what commercial companies offer now.

1.4.1.3.4.4 Validation, interoperability and EO synchronisation:

Interoperability is limited because the measured variables are new. Biological measurements are not standardized as of today. Starting a standardization working group within the European standardization committee. We combined the devices and their locations to create a well-functioning setup, placing them at sites already hosting multiple atmospheric and environmental measurements. We are now collaborating with colleagues from these networks to explore complementarities and perform cross-verification between datasets.

1.4.1.3.4.5 Sustainability and Key Exploitable Results:

A simple way is selling the devices with only test and validation added support. Another way is to propose to operate the backend infrastructure which requires a lot of competence in data management support.

1.1.1.1.1 *Georgio Tsimiklis, Institute of Communication and Computer Systems (ICCS), Cirocco*

1.4.1.3.4.6 Topic:

Enhancing the in-situ Environmental Observations across under-sampled deserts

1.4.1.3.4.7 Summary:

The project focuses on deploying low-cost, stand-alone in-situ sensing nodes in collaboration with local communities and commercial partners, ensuring sustainability and commercialisation beyond the project's duration. It will build a network of electronic sensors in under-sampled desert regions of Egypt, Serbia, and Spain, supported by data processing and fusion services to enhance access and quality of environmental observations. Scientifically, the project will provide key data to improve climate change models and address European Green Deal priorities, such as dust transport modeling, renewable energy planning, and ecosystem management. It will also strengthen cross-Copernicus integration and promote the adoption of CIROCCO tools and services by the wider community to ensure lasting impact and uptake.

1.4.1.3.4.8 Cost:

Low-Cost Sensing Node (LCSN) will be a stand-alone system and cost less than 1,000€.

1.4.1.3.4.9 Validation, interoperability and EO synchronisation:

Challenge on how to combine the INC2 measurements with all other sources and to fuse them with satellite data. Works on FAIR alignment using the libinsitu python library for in-situ data collections.

1.4.1.3.4.10 Sustainability and Key Exploitable Results:

Development of products and services for energy companies on the top of the in-situ measurement collection. Devices should be reused for CalVal activities.

1.4.1.3.5 *Luca Belelli Marchesini, Fondazione Edmund Mach, REMOTREES*

1.4.1.3.5.1 Topic:

A new technology of in-situ observation datasets to address climate change effects in hard-to-reach forest areas

1.4.1.3.5.2 Summary:

The RemoTrees project aims to design, develop, and test an innovative in-situ observation system that leverages Internet of Things (IoT) technology combined with satellite communication, specifically tailored for hard-to-reach forest environments. Addressing the critical lack of in-situ data from remote forest areas, RemoTrees introduces novel technological solutions that complement existing Earth Observation systems, enabling a more comprehensive understanding of climate change impacts on forest ecosystems at regional and global scales.

1.4.1.3.5.3 Cost:

Device targeted cost under 1000 €. A complete deployment will cost 20-25k€ per site including gateway and energy system.

1.4.1.3.5.4 Validation, interoperability and EO synchronisation:

Development of databases aligned with FAIR requirements using open standards and interoperable data formats. This includes OGC Sensor API and FROST-Server. Work with the GKH Team to integrate data in



the GKH while keeping link with the GEO DAB. Work to integrate in-situ data into the Copernicus in-situ component.

1.4.1.3.5.5 Sustainability and Key Exploitable Results:

The main avenue is producing low cost IoT based systems for forest observations taking into account that the market segment interested will be primarily scientific research in the field of forest ecology, climate change impact on ecosystems particularly for enhancing the already established observational networks.

1.4.1.3.6 *Nick van de Giesen, TU Delft, TEMBO Africa*

1.4.1.3.6.1 Topic:

Transformative Environmental Monitoring to Boost Observations in Africa

1.4.1.3.6.2 Summary:

The project aims at transforming nice ideas to operational observation networks and services in sub-Saharan regions of Africa. It builds user observatories on the top of seven innovative sensors including X-Band radar, intervalometer, commercial Microwave Links, BLOSM, GNSS (multi-tool), UAV + Fishfinder, IP Camera. The approach is to reduce the cost of such instruments up to 10% of their respective solution cost and empower local ownership to operate and maintain such sensors. On top of this the project tries to build services to earn money enabling them to maintain these observation networks.

1.4.1.3.6.3 Cost:

Low-cost devices might cost less than 1000€ but the full deployment of an energy system including 30 sensors on a site the cost of operation and maintenance is below 20k€

Validation, interoperability and EO synchronisation: TEMBO Africa was accepted as a pilot activity in the post 2025 program during the GEO Week in Rome in 2025. In-situ measurements are encoded in NetCDF using RESTful API. The three layers architecture will push data to GEO.

1.4.1.3.6.4 Sustainability and Key Exploitable Results:

It's very essential for TEMBO Africa to produce services that run projects. Promising services are identified including reservoir management enabling a company that runs a hydropower van to calculate how much our services are worth and there's a willingness and ability to pay and conversely government services like a flood warning system that becomes a little bit more difficult because of willingness to pay.

1.4.1.3.7 *Isabelle Picard, Flemish Institute for Technological Research (VITO), ScaleAGData*

1.4.1.3.7.1 Topic:

Upscaling agricultural sensor data for improved monitoring of agri-environmental conditions

1.4.1.3.7.2 Summary:

The project aims at developing data technologies including (data streaming, data analytics, AI,...) to scale in-situ data collected at the farm level into regional datasets for agri-environmental monitoring & management of agricultural production. The project works on the development of innovative approaches for collecting in-situ data from various existing sensors and works as well on the development of a set of new sensors like gas-sensing array, low-cost spectrometer or interferometer camera from drones. The project advances innovative data processing technologies through edge computing and sensor spatial planning. The YaraSense platform integrates IoT data logging, multi-protocol sensor management, and local data processing to reduce bandwidth use. Complementing this, sensor spatial planning ensures accurate ground truth data by optimizing sensor coverage, using Earth Observation data analysis, convex optimization, and soft clustering, with validation from dense sensor grids or high-resolution airborne datasets.



1.4.1.3.7.3 Cost:

The order of magnitude for the low-cost sensors ranges from a few hundreds to thousands of euros.

1.4.1.3.7.4 Validation, interoperability and EO synchronisation:

In-situ data interoperability challenges are addressed through standardization using NGSI-LD for context management and API before integrating them with satellite data. Further development including deep-learning, data fusion and the use of digital twins are conducted.

1.4.1.3.7.5 Sustainability and Key Exploitable Results:

Working on delivering operational services on methodological frameworks for the research community.

1.4.1.4 Discussions

The exchanges were lively, and the main contributions covered the following points:

- Transitioning research to commercial products requires full solution packages, proving economic benefits, and aligning with end-user needs, not just selling sensors.
- Challenges include integrating multiple products, keeping pace with fast-evolving IoT and micro-electronics, and ensuring cost-effectiveness despite demands for expensive instruments.
- Data generation and usability are key, emphasizing user-friendly, customizable solutions and connecting datasets to existing models like air quality forecasts.
- Citizen involvement is valuable but challenging, with potential for household sensors, mobile app data, and climate awareness campaigns to bridge gaps.
- Collaboration and scalability are crucial, with efforts to create clusters of common challenges and ensure long-term sustainability through stakeholder engagement.

Discussion and questions from the audience:

- **Luis Felipe Lages** (Nova School) What is the dynamic in the field moving from research activity to product for pay?
- **Tuan:** You need to provide a full solution package, not only the sensor. You need to know where the economic benefits are. You need to prove the real benefit for a potential end-user.
- **Maria:** Not selling sensors. More complex workflow. Focus on providing the useful variable and the methodology.
- **Mikael:** New devices need to prove their usefulness. Making cheaper instruments needs to be finally assessed.
- **Georgio:** Big challenge for the next commercial step: how potentially you can combine some more products into a better commercial solution in the end.
- **Luca:** Evolution of technology particularly in the IoT sector and micro-electronics is going extremely fast. In our project our 3 prototypes we must improve technically the devices but also need to keep track of these evolutions. Hope to have a competitive advance with our final product for the company in the project by the end of the project.
- **Nick:** People said that 10% of the cost was not possible. Counterintuitive arguments. People want expensive instruments.

- **Maude Perrier-Camby** (Vortex): The Vortex company deploys its own sensors for water monitoring in France and everywhere in the world. The company started with innovation seeding by initially selling the data and switching to sell the sensors as Sensor-aaS. Long process to reach the market with the need to set the price, sell the data and sell the sensors. Long story. Sensors in France, Croatia, Italy, Germany. Data is sent in real time to the Vortex platform for local authority and security as well as for the private sector.
- **Eleni Athanasopoulou** (NOA): Work horizontally to address common challenges and to create a cluster of commonalities for the 7 projects. Webinar announcement on low-cost sensors building in November 2025.
- **Orestis Speyer** (NOA): What is the added value the project brings to the Copernicus in-situ components.
- **Tuan**: Generating dataset requires a lot of effort and time and it is very costly, so it is more important to develop solutions that are user friendly and duplicatable with the potential to enable stakeholders to customize themselves.
- **Mickael**: Sylva is already contributing to the air quality forecast with air pollen. Need to connect to the assimilation models. Maintenance of the system is around 50k€ per year of current public money. The infrastructure is fully open and free to access.
- **Steffen Fritz** (IIASA): Closing the data gaps. Do citizens adopt and help with such endeavors? Any sensors to be more distributed in any households?
- **Georgio**: Citizen could be a good addition. It is hard to be chased.
- **Nick**: It is difficult: 600 sensor weather stations are located in schools in Africa so close to the community.
- **Mikael**: On the biological side citizens themselves are sensors. Data can be collected from mobile Apps for pollen. Apps already collect allergies from citizens.
- **Tuan**: The farmer needs to report. Problem of motivation for larger audience.
- **Luca**: Citizen science can be applied to devices monitoring trees particularly the ones building consciousness of impact of climate change on the people.

1.4.1.5 Specific recommendations to EuroGEO

In-situ data are for many application areas essential and fully complementary to satellite-based observations. The session has clearly outlined how projects are combining the in-situ data with Copernicus Sentinel data or data from the Copernicus services in end-user services and applications. Hence, as recommendation, in each EuroGEO Action Group, sufficient attention needs to be dedicated to the full data range, not only satellite and in-situ data, but as well citizen observed data, socio-economic data, etc, and to align with the GEO in-situ working group on these aspects. And on providing best-practices and recommendations how in-situ data in their thematic is / can be made FAIR available, including the governance and cost/revenue models.



1.4.2 Regional engagement

This session highlights the importance of the involvement of stakeholders at a regional level for the Earth Observation community, and explores strategies, mechanisms and activities that contribute to this direction, through regional coordination, international partnerships, support of digital solutions, and capacity building towards addressing global challenges with EO-based solutions and Earth Intelligence for All. It focuses on the European contributions, on the one hand, and benefits for Europe, on the other hand. It brings together representatives from the Group on Earth Observations, the European Commission DG INTPA, as well as key activities, such as the Digital and Green Innovation Action and the GEO Enabling Mechanism GEO-CRADLE.

1.4.2.1 Moderators

- Alexia Tsouni, National Observatory of Athens
- Valentin Thibault, European Commission, DG INTPA

1.4.2.2 Speakers

- Sara Venturini, GEO Secretariat
- Alice Guibert, Expertise France, Digital Green Innovation project
- Haris Kontoes, National Observatory of Athens, GEO Cradle

1.4.2.3 Session overview

Alexia Tsouni and Thibault Valentin first welcomed the participants and introduced the concept and the agenda of the session.

Sara Venturini presented the Joint Regional GEO Coordination. She analysed the Post-2025 GEO Strategy which promotes Earth Intelligence for All by co-producing transformative trusted programmes, increasing global equity, integrating new technologies and innovations into the services, increasing the participation of young people, and investing in integrated activities to raise awareness and resources. She highlighted the focus of the 4 Regional GEOs (AOGEO, AmeriGEO, AfriGEO, EuroGEO), and she encouraged EuroGEO to further use and contribute to the GEO Knowledge Hub, which is a central cloud-based digital library created to preserve, disseminate, and support the reuse of EO Applications developed by the GEO Community.

Thibault Valentin presented the EU international partnerships in EO and explained how they are contributing to sustainable development, eradication of poverty, promotion of peace, democracy and human rights across the world. He demonstrated the Global Gateway strategy, EU's sustainable offer to partner countries to accelerate fair and green transitions and to meet infrastructure needs. He explained that the Neighbourhood, Development and International Cooperation Instrument (NDICI) – Global Europe is the financing tool for international cooperation of the current MFF (2021-2027) and underlined that Copernicus's full, free and open data policy allows for INTPA to contribute to the projection of the EU Space programme to partner countries. He then focused on the specific partnerships in the three regions (Africa, Asia & Pacific, and Latin America & Caribbean), and concluded with the coordination with the European stakeholders, presenting the D4D Hub (Digital for Development), which is a Global Gateway instrument putting in place an EU+MS platform to coordinate and strengthen European digital cooperation efforts, boost joint investments, and foster multi-stakeholder collaboration and knowledge sharing, building on MSs digital expertise and networks.

Alice Guibert presented the Digital and Green Innovation (DGI) Action, one Team Europe Action advancing twin transition on innovation & entrepreneurship under the D4D Hub. She then focused on the acceleration of the twin transition through EO in Latin America and the Caribbean (LAC). The key digital technology focus is the Copernicus data, and the DGI activities include an accelerator program, capacity building, multi-stakeholder policy dialogue, and investment mobilization. LAC companies are supported to build Copernicus-based climate services addressing key challenges across the region and a train-the-trainer program is implemented for local green business support organizations.

Haris Kontoes presented the GEO-CRADLE, which started as a H2020 Coordination & Support Action in 2016 and is currently a GEO Enabling Mechanism providing GEO capacity building in the Balkans, Black Sea, Middle East, Africa, and Pacific Asia Regions. GEO-CRADLE has engaged large and skilled communities, namely IEEE-GRSS, the GEO Indigenous Alliance, the Humanitarian OpenStreetMap Team, UN-SPIDER, Digital Earth Africa, Digital Earth Pacific, Eratosthenes Center of Excellence and the private sector (EARSC, EDGE, Open Healthsite Consulting). He underlined that a wide range of stakeholders / end-users are benefitting from GEO-CRADLE, including policy makers, national governmental institutes, public utilities companies, private companies, cooperatives, foundations, universities and research institutes. He highlighted two of the GEO-CRADLE's success stories: the Early Warning System for Mosquito Borne Diseases – EYWA (winner of the EIC Horizon Prize), and the Solar Energy services; both of them were further developed during the H2020 e-shape project, and achieved sustainability. He concluded with the ongoing efforts to provide capacity building in the Pacific Asia region, following the successful Technology, Industry and Education (TIE) session “Advances and Applications in Earth Observation for SDGs. Accelerating Earth Intelligence in the context of GEO” which was organised in IEEE IGARSS 2025, Brisbane, Australia.

1.4.2.4 Specific recommendations to EuroGEO

- EuroGEO should actively contribute to the implementation of the Post-2025 GEO Work Programme, given that it introduces a mission-driven, user-centered structure built around thematic priorities, and innovation to deliver Earth Intelligence for All. In this direction, the EuroGEO Action Groups should be coordinated and supported, towards a win-win collaboration with GEO, especially for the GEO work programme activities that are led/driven by the EuroGEO community.
- EuroGEO should further contribute to the GEO Knowledge Hub with the EO Applications developed by the EuroGEO community.
- EuroGEO should explore the support and opportunities offered by the EU international partnerships in EO in line with the Global Gateway strategy and raise awareness among the EuroGEO community about the available financing tools for international cooperation (NDICI – Global Europe) and instruments (D4D Hub).

1.4.3 Co-design method for Earth Observation

Bridging the Grand Distance between EO experts and potential users is a major challenge in the Earth Observation (EO) sector. This gap has long limited both the commercial exploitation of EO services and their societal impact across Europe.

To address this, the EU has supported the development of co-design methods tailored to the EO domain, first through e-Shape, and now via Destination Earth. These methods aim to help the EO community design user-driven services that respond to concrete needs and generate economic as well as societal value.

Promoting and systematizing the use of these methods is now central and stands as a critical component of the "conveyor belt" supported by the EuroGEOsec for enabling Earth Intelligence.

1.4.3.1 Moderators

- Alexandre Azoulay, MINES Paris PSL, codesign4destine
- Malik Terfous, MINES Paris PSL, codesign4destine

1.4.3.2 Speakers

- Lefteris Mamais / Julia Caufape, Evenflow
- Franka Kunz, European Space Agency
- Evangelos Gerasopoulos, National Observatory of Athens

1.4.3.3 Session overview

The objective of this side event was to introduce the co-design methods for Earth Intelligence, to demonstrate their value for the EO community, and to reflect on six years of development and application of these methods. It was structured in three parts:

- A presentation of the EuroGEOsec's vision regarding the role of co-design in Earth Intelligence;
- An introduction to the co-design method and associated tools supported by EuroGEO Sec;
- A roundtable discussion with key stakeholders from the European EO community to reflect on achievements made possible through co-design and explore perspectives for large-scale deployment of these methods.

The session opened with Lefteris Mamais, Director of Evenflow. He highlighted that Earth Observation (EO) delivers critical insights for evidence-based policies and decision-making, driven not only by operational needs but also by regulatory obligations. However, a persistent gap between EO solutions and user needs remains — often due to a *technology push* rather than a *user pull*. Lefteris emphasized that bridging this gap requires a shift from data delivery to solution co-creation, deep user engagement, and an understanding of user workflows and formats. Co-design, he argued, is iterative by nature, fostering trust and relevance, and should be systematically implemented across the EuroGEO community to share best practices and create a blueprint for others.

The second talk, by Malik Terfous on behalf of two research centres from Mines Paris PSL working on co-design for EO, explored how to design with unknown or diverse users. They addressed the challenges of bridging the distance between data experts and potential users and structuring complex, multi-stakeholder ecosystems.

Their methodology, developed within the e-shape and Destination Earth projects, identifies three key dimensions of co-design:

1. The design aspect (collaborative creation),
2. The collective aspect (stakeholder interaction), and
3. The crisis aspect (redefining relationships when conventional engagement fails).

This framework, which extends across both the perspective of inter-actor relationships and the perspective of service development, was operationalised within the European Commission's Destination Earth (DestinE) initiative. It demonstrated its added value by supporting the creation of a municipal 'supersite'—an integrated aggregation of services coherently aligned with the identified needs of the City of Marseille and grounded in DestinE data assets.

1.4.3.4 Discussions

Building on these talks, the panel discussed the practical application and broader value of co-design methodologies in EO service development. The structured process involves four phases — user engagement, diagnosis, co-design sessions, and outcomes — supported by principles of usefulness, usability, operability, sustainability, and scalability, which are five components of fitness for purpose. A co-design toolkit and interactive website are in development, with supporting scientific papers under review.

Speakers, including Franka (ESA), Evangelos (Greek Geo Office), Lefteris (Evenflow), and Malik (Mines Paris, PSL), shared different experiences, such as initiatives like Destination Earth and the Marseille pilot, illustrating how co-design builds trust, shared ownership, and ensures solutions are fit for purpose.

Interactions with the audience addressed the fitness for purpose and the replicability of the co-design method:

- The entire methodology aims to ensure that EO services are designed both for specific user communities and real-world needs, but also generic and usable with an array of other potential users / potential contexts.
- The methods and tools were tested in cases such as Marseille, with extensive documentation.
- Upcoming research papers will detail the evaluation process and findings.

1.4.3.4.1 Roundtable 1: Value of Co-Design

- ESA linked co-design to Destination Earth (DestinE), an EU initiative developing digital twins of Earth (starting with extreme weather and climate). It was emphasized that co-design sits between the end user and service provider — ensuring operational and usable methodologies.
- The Greek Geo Office highlighted trust-building and shared ownership as critical for sustainability and adoption. Positioned co-design within a broader systemic approach.
- EvenFlow stressed the importance of business model fitness alongside service fitness. Warned that services may meet user needs but fail commercially if users aren't willing to pay. Recommended staying flexible about user segments and considering monetization early.

1.4.3.4.2 Roundtable 2: Equality and Shared Process

- MINES Paris PSL described how co-design sessions brought together diverse profiles (managers, policymakers, etc.). It was noted that users often think they know their needs, but co-design reveals deeper or different ones. The process helped participants feel equal and collaboratively engaged.

1.4.3.4.3 Roundtable 3: Adoption and Dissemination

- ESA plans to expand the toolkit to include different user personas to better target entities. Advocated for training programs and integration into the DestinE platform so all stakeholders can use it.
- The audience recognized co-design's value and discussed making it operational and scalable, potentially as "co-design-as-a-service." Exploring a DIY online tool to facilitate widespread use.
- A third paper under development explores who funds co-design.

1.4.3.4.4 Open discussion

- Business and Sustainability is a bottleneck to the adoption of co-design methodologies. MINES Paris PSL is working on sustainability models for co-design methods.
- Audience member (E-Shape advisor) noted:
 - Co-design is a win-win, but its value must be clearly communicated to justify investment.
 - Friction often arises because both sides underestimate the value of the methodology.
 - Continuing to refine and communicate the business model is essential.
- Venture capitalists' insight: They want to be involved from the very beginning of development processes.
- Involvement of Meteorological Services:
 - KNMI asked whether European meteorological services were involved, noting they face similar challenges in designing user-oriented services for diverse stakeholders.
 - The German Meteorological Office expressed interest in "train-the-trainer" programs and active participation.
 - ESA responded positively, welcoming collaboration.

1.4.3.5 Specific recommendations to EuroGEO

The development of applications from EO data is particularly challenging as it connects different and highly heterogeneous socio-economic ecosystems. Co-design aims to bridge distant ecosystems through the development of EO-based services and to support their dynamics in the long term.

With the upcoming publication of ESA DestinE's online toolkit (<https://www.codesign4destine.eu>), co-design is now a tested, operational, and documented methodology. The co-design model was progressively developed and tested with e-shape's pilot applications, then expanded and tested in a larger context, to be turned into a toolkit for the DestinE platform. This methodology, finetuned towards the EO domain, can now be used as a core knowledge resource for the community.

- A major recommendation to EuroGEO is to keep including this topic in future events to continue the conversation and use cases.
- Co-design must be structured, inclusive, and operationally viable.
- Trust, ownership, and flexibility are critical for long-term sustainability.
- Fitness for purpose should guide both service and business model design.
- A co-design toolkit, supported by scientific research and digital infrastructure (DestinE, EuroGeo), will help scale adoption.
- Funding and clear communication of value remain pivotal for co-design's sustainability.



EuroGEO should promote co-design best practices and support EuroGEO Action Groups, ensuring effective knowledge transfer and wider adoption of EO solutions. EuroGEO should be engaged to support the uptake of co-design methods within the community. Several paths are possible:

- Firstly, EuroGEO should promote the dissemination of co-design methods within the EO community. It should be supported by an open and accessible ecosystem, including toolkits, tutorials, and interactive resources, enabling service providers, researchers, and stakeholders to self-train and integrate co-design at their own pace. This effort is currently being supported by ESA for DestinE but could benefit the EO community.
- Secondly, EuroGEO could mobilise entrusted parties to provide Co-Design “as a Service” to the EuroGEO Action Groups and therefore support the EO community, as part of the functions supervised by a EuroGEO Secretariat. These organizations could offer hands-on support, including facilitated workshops, targeted training, coaching, and access to a harmonized knowledge base. The goal is to provide a structured and guided pathway for stakeholders who prefer professional assistance rather than fully autonomous adoption.
- Eventually, co-design should become a standard practice for the EO domain. On a longer-term perspective, consultants or specialized firms should train on EO co-design methods and deliver co-design support on a fee-for-service basis. These experts could act as “multipliers,” providing tailored workshops, co-developing tools and methods, and offering on-the-job training to project teams. The approach could enable rapid deployment of expertise and flexibility for organizations lacking permanent internal capacity.



1.4.4 Post-conflict recovery in Ukraine

Like many countries Ukraine is facing such challenges as air pollution, soil erosion, floods, fires etc. Apart from that there is also a huge impact of the Russian aggression, particularly destroyed infrastructure and housing, mined territories, changes in ecological balance, etc.

As a consequence of Russian aggression our environment, agricultural lands, and water resources have suffered extensive damage. Millions of hectares of forests and soil will require restoration. The infrastructure for environmental monitoring has been significantly damaged. Huge areas need to be cleared of mines.

Among the many problems that Ukraine faces, such as air and water pollution, are also European ones that require joint discussion, strategy development and action plan for their solution. Combining efforts will increase the effectiveness of preparation and implementation of post-war recovery program in Ukraine

1.4.4.1 Moderator

- Sergey Gerasymchuk, GEO Focal Point, Member of the UkrGEO Office, National Space Facilities Control and Test Center (NSFCTC)

1.4.4.2 Speakers

- Volodymyr Mikheiev, GEO Principal, Head of the UkrGEO Office, Deputy Head of the State Space Agency of Ukraine
- Ivana Aleksovska and Guido LEMOINE, European Commission, JRC-ISPRA
- Eric van Valkengoed, TerraSphere BV, Director
- Michel Rixen, Senior Programme Officer, Copernicus Principal Expert, European Commission
- Nataliia Kussul, National Technical University of Ukraine, Igor Sikorsky Kyiv Polytechnic Institute
- Conrad Bielski, Riscognition
- Andrii Shelestov, National Technical University of Ukraine, Igor Sikorsky Kyiv Polytechnic Institute
- Francesca Piatto – European Association of Remote Sensing Companies
- Arthur van der Meer – Space4Good

1.4.4.3 Session overview

1.4.4.3.1 Volodymyr Mikheiev, GEO Principal, Head of the UkrGEO Office, Deputy Head of the State Space Agency of Ukraine

Current challenges and post-war recovery in Ukraine. The Ukrainian GEO office was established in January 2025. The implementation of its GEO Strategy for the post-2025 period will not only aim to fulfil international commitments and further European integration. It will also address the challenges Ukraine faces due to the full-scale Russian aggression. A key feature of this Strategy is the paradigm shift from “Earth observation” to “Earth intelligence,” focusing on the development of technologies for using “big



data” — including ground and satellite observations, navigation, telecommunications, and geospatial data — integrated with artificial intelligence for improved understanding of the planet.

In his remarks, Mr. Mikheiev underlined that in the current wartime conditions, the priority areas of Ukraine’s activities are national security and defense. He highlighted the main tasks and challenges that the UkrGEO Office is addressing, including:

- assessment of destroyed infrastructure and housing using modern technologies, including AI tools;
- humanitarian demining of territories temporarily occupied by the aggressor;
- diagnostics of the underground infrastructure and environmental impacts of war.

Mr. Mikheiev emphasized Ukraine’s strong interest in cooperating with international and European partners to address these urgent challenges. In line with the GEO Secretariat’s proposal, he announced the GEO Initiative on Post-War Recovery of Ukraine, aimed at developing modern tools for environmental, infrastructure, and agricultural monitoring as a foundation for the country’s reconstruction.

The first steps of this Initiative may include establishing an international working group, identifying common priorities, developing a joint action plan, and defining pilot projects and funding mechanisms.

1.4.4.3.2 Ivana Aleksovska and Guido LEMOINE, European Commission, JRC-ISPRA

A simulation-based framework to assess vulnerabilities in Ukraine’s agricultural supply chain using earth observation, agronomic yield estimation and infrastructure data 15% of Ukraine’s storage capacity in the agricultural sector has been destroyed, with grave impact on global food supply chains and producers. So far, monitoring based on Earth Observation focused on production. INT4AGRI integrates data on production, logistics and crisis shocks.

1.4.4.3.3 Eric van Valkengoed, TerraSphere BV, Director

Building a Land Parcel Identification System (LPIS) in Ukraine using VHR Satellite Images. An accurate LPIS lies at the basis of the Common Agricultural Policy. In Ukraine, the war prohibits the traditional use of aerial photography for the mapping of land parcels. Depending on the provider, high resolution satellite data allow for mapping of agricultural plots with a precision of 30 or 70 centimeters.

1.4.4.3.4 Michel Rixen, Senior Programme Officer, Copernicus Principal Expert, European Commission

Copernicus tools to cope with challenges such as destroyed infrastructure and housing, mined territories, changes in ecological balance. The EU-Ukraine Association Agreement from 2014 identified earth observation, space and satellite technology as areas for mutual cooperation. The 2018 Copernicus Cooperation Arrangement laid the legal base for earth observation data sharing. Upon ratification in 2025, Ukraine will be eligible for participation in components of the EU Space Program. A wide range of programs is available for improved management of air quality, water quality, biodiversity, combating forest fires, marine (emergency) monitoring, etc.

1.4.4.3.5 Nataliia Kussul, National Technical University of Ukraine, Igor Sikorsky Kyiv Polytechnic Institute

War-induced damage assessment with earth observation and AI. Sentinel data are being used for assessment of damage to and abandonment of agricultural plots, assessment of damage to protected areas and ecosystems, etc. Various international organizations have provided funding. In 2022 alone 4 million craters and 2 million hectares of damaged agricultural area were identified.



1.4.4.3.6 *Conrad Bielski, Riscognition*

Copernicus applications for next generation forest monitoring. The FUTUREFOR project uses Copernicus and existing national data for improved resilience of European forests.

1.4.4.3.7 *Andrii Shelestov, National Technical University of Ukraine, Igor Sikorsky Kyiv Polytechnic Institute*

Earth intelligence for recovery in Ukraine. Earth observation data used for mapping investment opportunities in rural areas, clean energy potential and detection of changes in land use.

1.4.4.3.8 *Francesca Piatto, European Association of Remote Sensing Companies*

Leveraging European earth observation capabilities for environmental and civil resilience in Ukraine. The war in Ukraine has increased awareness and urgency of investment in earth observation capabilities. Revenue growth centered around the larger companies in the sector.

1.4.4.3.9 *Arthur van der Meer, Space4Good*

Remote sensing for ERW and risk mapping in Ukraine. About 30% of Ukraine is contaminated with explosives. An estimated 10% of explosives is as of yet unexploded. A broad range of partners cooperate in Space4Ukraine to use satellite data and AI for mapping, de-mining and cleaning up, starting with high-risk areas.

1.4.4.4 Discussions

The session was very well received. The presentations illustrated how earth observations can be instrumental in taking action, even while the war is still ongoing. The Ukrainian delegation highlighted that many of the current challenges are similar to those of other European countries, while others are war-specific or war-aggravated.

Given the number of speakers in this session and the subsequent EuroGEO reception, there was very limited time for discussion and Q&A. Two attendants made a supportive statement. The attendants were invited to take note of a Dutch subsidy program, the [Ukraine Partnership Facility](https://english.rvo.nl/subsidies-financing/upf) (<https://english.rvo.nl/subsidies-financing/upf>). After closing of the session the attendants had lively conversations as a follow-up.

1.4.4.5 Specific recommendations to EuroGEO

A concrete recommendation was made in closing of the session, to establish a EuroGEO informal working group for current challenges and post-war recovery in Ukraine, to be included in the implementation plan.

1.4.5 Monitoring SDGs to Protect Citizens from Climate Risks EO insights on wildfires, heatwaves, and decision-ready policy

An event sponsored by the SDGs-EYES project and hosted by EuroGEO. SDGs-EYES has received funding from the European Union's Horizon Europe Programme for research and innovation under GA number 101082311.

The session focused on exploring how European Earth Observation (EO) can contribute to climate-risk governance and Sustainable Development Goals (SDGs) over the next five to ten years. Participants began by assessing the current state of EO in Europe, recognising that it has already become a cornerstone in climate monitoring and risk management. They noted that the availability of new sensors and emerging technologies will further improve the precision and timeliness of climate-related information. However, there was a consensus that the path ahead requires stronger integration of EO data within broader systems of governance and decision-making.

1.4.5.1 Moderator

- Dr. Antonella Passani, T6 Ecosystems, Head of Research

1.4.5.2 Speakers

- Claire Jacobs, Wageningen University & Research
- Jean Dusart, Senior Policy Officer, European Commission's Directorate-General for Research and Innovation (DG RTD)
- Thomas Kemper, GHSL project, Disaster Risk Management Unit, European Commission Joint Research Centre (EU-JRC)
- Fernando Sedano, Scientific Officer at Joint Research Centre, European Commission, Joint Research Center (EU-JRC)
- Emmanuel Pajot, Secretary General, European Association of Remote Sensing Companies (EARSC)

1.4.5.3 Session overview

The session started with the presentation of the SDGs-EYES project, its services, its co-design-centred process and the policy recommendations recently designed with the consortium. More specifically, the SDGs-EYES approach was presented to strengthening Europe's capacity to monitor environment-related SDG indicators using Copernicus data.

The first presentation highlighted the project's co-design methodology, which brings together local authorities, researchers, civil society and technical experts to ensure that climate-related services are usable, relevant and aligned with real decision-making needs. Through structured engagement cycles—including requirements analysis, prototype development, validation and uptake—the project has involved more than 150 stakeholders who contributed to refining tools across several pilot cases. Examples included improved vulnerability weighting in the Heat & Health Risk Assessment tool for Turin and enhanced spatial-temporal resolution for monitoring marine eutrophication and ocean acidity in the North Sea.

The second presentation focused on how SDGs-EYES combines Copernicus data with health, environmental and socio-demographic information to map climate-related risks, demonstrate new services such as FIRE-TRACE for improved forest-fire emissions accounting, and support targeted local interventions. It was emphasized the need to bridge the gap between research and policy, highlighting persistent challenges such as fragmented data ecosystems, institutional inertia, limited local capacity, and

the need for stronger validation frameworks. The presentations concluded with the SDGs-EYES recommendations to ensure long-term impact which include adopting open standards and interoperable workflows, investing in continuous model refinement and ground-truthing, deploying user-friendly cloud platforms supported by training, and promoting open-source approaches and sustained public-private funding to secure the future use of SDGs-EYES services.

The presentation was followed by a panel discussion that discussed the challenges and recommendations identified by the SDGs-EYES project.

The first part of the exchange focused on exploring how European Earth Observation (EO) can contribute to climate-risk governance and Sustainable Development Goals (SDGs) over the next five to ten years. Participants began by assessing the current state of EO in Europe, recognising that it has already become a cornerstone in climate monitoring and risk management. They noted that the availability of new sensors and emerging technologies will further improve the precision and timeliness of climate-related information. However, there was a consensus that the path ahead requires stronger integration of EO data within broader systems of governance and decision-making.

While Europe has achieved remarkable progress with the Copernicus programme, several speakers cautioned against assuming that Europe is the uncontested leader in EO. Despite Copernicus' strengths, many operational systems still rely on American satellites, revealing persistent dependencies and the need for continued international cooperation. It was underlined that the European EO ecosystem will play a significant role, but autonomy and partnerships must coexist in the global context of data provision and use.

Speakers also emphasised that Earth Observation should not be perceived as the central or sole solution to complex environmental and societal challenges. Rather, EO should be considered one of several complementary sources of information within a broader data ecosystem. Decision-makers and end users are primarily interested in actionable insights — in reports, indicators, and validated trends — rather than the technical origin of the data itself. Consequently, effective communication (to decision makers but also to citizens) and translation of EO outputs into policy-relevant information were identified as remaining bottlenecks. The need to make clearer the value added of EO to different stakeholder emerged clearly and, as anticipated, communication is perceived as central in this regard.

Another key topic was the persistent gap between research activities and operational services. Participants agreed that mechanisms like Pre-Commercial Procurement (PCP) and Small Business Innovation Research (SBIR) offer promising avenues to bridge this divide. These instruments foster co-design and sustained engagement between developers and users from the early stages of innovation. Examples from the Netherlands illustrated how such initiatives enable the joint identification of real-world problems, design of challenge-driven tenders, and testing of innovative EO-based solutions that continue beyond the project lifetime. Indeed, how to ensure EO services long term sustainability is something that should be considered since its initial development to avoid the fragmentation of initiatives and to build trust in the developed solutions.

The discussion referenced successful cases where top-down policy mandates accelerated the use of EO, notably the Common Agricultural Policy (CAP) monitoring system. Under CAP, the European Commission's requirement for automated agricultural monitoring compelled member states and farmers to adopt EO technologies, replacing manual field declarations with EO-supported verification. This was cited as evidence that regulatory pressure can effectively stimulate technological uptake.

Speakers also highlighted the importance of building trust and demonstrating maturity in EO applications. Transitioning from research prototypes to stable operational systems requires continuity, validation, transparency and sustained user engagement. Trust develops gradually as services prove their consistency

and reliability. Participants acknowledged that EO professionals may sometimes overestimate readiness levels and underestimate the time required for institutional adoption.

In a more forward-looking exchange, participants were invited to consider how they would allocate limited resources if political will was strong but budgets were constrained. Priorities included reinforcing communication with stakeholders, investing in awareness-building across public administrations, and ensuring that local and regional authorities can access and benefit from EO-enabled services. Another recurring theme was the need for Europe to strengthen its technological independence while maintaining global collaboration.

Finally, the conversation turned to the evolving policy landscape. Tools such as the European Commission's Public Sector Purchase of Services (PSPS) mechanism and upcoming strategies referencing Copernicus use in regulatory frameworks were described as potential game changers. Expanding such tools to include not only data but also EO-based services could help accelerate uptake, create market opportunities for European providers, and mainstream EO within the EU's policy and administrative machinery.

1.4.5.4 Discussions

The audience provided insightful reflections that complemented the main discussion. Several interventions highlighted the paradox of data abundance coexisting with limited policy impact. In the Netherlands, for instance, vast amounts of spatial data are available, yet their use in policy evaluation and accountability remains modest. The issue, participants suggested, lies less in data availability and more in the political courage to use it. Policymakers must be willing to base decisions on objective indicators and to accept the transparency and scrutiny that come with data-driven governance.

One participant argued that the true value of EO will only materialise when it becomes an integral part of the policy cycle — not just for monitoring, but for learning, evaluation, and continuous improvement. Without this feedback loop, even the most advanced EO systems risk becoming underutilised technical tools.

Audience members also drew attention to ongoing difficult debates at the European Parliament on the "Monitoring framework for resilient European forests" which referenced Copernicus as a primary tool for assessing forest conditions. This example was used to show how EO can move from project-based applications to institutionalised monitoring frameworks, provided that political leadership supports implementation.

Another audience observation addressed the gap between national and local reporting on SDGs. While there has been significant progress at the national and UN levels — notably the reduction of Tier 3 indicators — SDG reporting at the city or municipal level remains largely voluntary and uneven. Many local authorities rely on proxies or incomplete data simply because of limited data or resources availability. This underlines the importance of enabling local-level EO integration and fostering cooperation between cities, statistical offices, and EO communities.

1.4.5.5 Specific recommendations to EuroGEO

The session generated a rich set of takeaways that can inform EuroGEO work in promoting the European Earth Observation ecosystem and its contribution to sustainable development and policymaking.

EuroGEO should first reinforce its role as a connector and communicator between the EO community and the policy domain (for example towards the EC). Strengthening channels of dialogue with public authorities at both national and local levels will ensure that EO capabilities are aligned with real policy needs. This includes developing accessible narratives and evidence that convey EO's tangible value in terms of economic efficiency, risk reduction, and sustainability outcomes.

Second, EuroGEO can play a proactive role in promoting and supporting co-design and pre-commercial procurement mechanisms, working alongside national space agencies, the European Commission, and innovation-oriented public bodies. By encouraging early involvement of end users, these instruments can reduce the research-to-market gap and enhance long-term service sustainability.

Third, the initiative should support the integration of EO within regulatory and institutional frameworks. This can be achieved by identifying areas where EO can contribute to mandatory reporting, monitoring, and policy evaluation — such as agriculture, forest management, or urban resilience. Embedding EO into existing policy instruments will accelerate uptake and secure stable demand for European service providers.

Fourth, EuroGEO should champion the combination of multiple data sources — EO, in-situ measurements, and socio-economic datasets — to deliver user-oriented, actionable intelligence. Promoting interoperability and standardisation will further enhance the usability and credibility of EO information.

Fifth, capacity-building and awareness-raising at the local and regional levels should be prioritised. SDG implementation, disaster preparedness, and environmental management often occur at these scales, where knowledge gaps and resource constraints persist.

Finally, the session emphasised the importance of communication and accountability. EuroGEO should contribute to making EO “visible and indispensable” — not only to the scientific community but also to policymakers and the public. Demonstrating EO’s role in improving transparency, monitoring public spending, and informing better policies will help build societal trust and sustain investment.

In conclusion, participants and audience alike recognised that the true potential of EO lies not only in technological advancement but in its integration into governance, policy, and daily decision-making. EuroGEO is well positioned to help bridge this divide by fostering collaboration, promoting innovative procurement models, and embedding EO solutions in Europe’s sustainable development agenda.



2 R&I in Action

This day focused on the innovation pipeline for Earth observation. Starting with the role of research in scaling EO solutions, followed by four thematic tracks discussing priorities of the Copernicus Strategic Research and Innovation Agenda: AI, in situ data, infrastructure and standards, and socio-economic data integration. A plenary session focused on youth and startup initiatives, exploring how EuroGEO can better support new actors in the EO ecosystem. The afternoon was dedicated to recommendations from the Action Groups, discussing thematic R&I. These inputs would directly shape the EuroGEO Implementation Plan. The day ended with informal side meetings and networking.

2.1 Scene setting. Research and innovation for the EO service sector

To set the tone for a day focused on translating research and innovation into real-world impact. The session explored how research and innovation act as key drivers in scaling the uptake of Earth Observation (EO) across multiple sectors, including climate services, agriculture, urban planning, and emergency response. It highlighted the persistent gap between promising pilot projects and their transition to operational, market-ready services, and discussed strategies to overcome structural, technical, and financial barriers. The session also introduced the core themes of this second day – enabling technologies, co-design of EO solutions, data access and governance – and explained how these align with the EuroGEO Implementation Plan and Europe’s policy priorities, including the Green Deal, digital transformation, and resilience strategies.

2.1.1 Speakers

- Lefteris Mamais, Evenflow
- Mark Dowell, European Commission, Joint Research Center (JRC)
- Michel Rixen, European Commission, Directorate-General for Defense Industry and Space (DG DEFIS)
- Haris Kontoes, National Observatory of Athens (NOA)

2.1.2 Keynote

- Joanna Drake, European Commission, Directorate-General for Research and Innovation (DG RTD)

2.1.3 Session overview

Despite uncertain times, there is strong confidence that, with community support, GEO can secure a positive future. The statements shared ahead of the GEO Global Forum and the adoption of a rich, diverse Work Programme illustrate GEO’s strength as a global community harnessing Earth Observation to tackle a wide range of issues.

The Horizon Europe proposal and the Competitiveness Fund come with an increased attention to defense and space, with a proposal totaling €131 billion for these two sectors, five times the amount of the current Multiannual Financial Framework, which clearly shows that Earth Observations is a priority. Work has just



started with the Parliament, the Council and the Member States to translate this ambitious proposal into actions.

2.1.3.1 A new policy landscape that should influence our ambitions for GEO

On 15 September 2025, the European Commission launched a new strategy to strengthen Europe's research and technology infrastructures. This initiative ensures that scientists, researchers, innovators, and industry have easy access to Europe's cutting-edge facilities, high-quality data, and tailored services. It also aims to attract world-class talent and encourage researchers and innovators to "Choose Europe."

Another example is the Startup and Scaleup Strategy, which sets out legislative, policy, and financial support measures at both EU and Member State levels to meet the needs of innovative companies throughout their development.

Finally, the Strategy for AI in Science, adopted last week, will establish the Resource for AI Science in Europe (RAISE) a virtual institute pooling talent, compute capacity, data, and research funding to strengthen Europe's position in AI-driven scientific excellence.

2.1.3.2 How to deal with those changes?

The Copernicus programme, new technologies, in the area of Artificial Intelligence, Digital Twins, cloud computing, there will be new opportunities to deliver Earth Intelligence, tailored to the needs of massive numbers of end users efficiently.

The landscape analysis of partnerships, networks and projects conducted by the EuroGEOsec project quantified the construction of the EuroGEO community and mapped the overall contribution of the EC funded projects to GEO.

« *Delivering Earth Intelligence to accelerate the green and digital transition* » attracts a dozen of very good proposals our colleagues from the Research Executive Agency started to evaluate.

With the adoption of the last Work Programme of Horizon Europe in the coming months, new opportunities will become available with for example a call on "*Interconnecting EO research for addressing environmental policies*" or an open topic on "*Developing Earth Intelligence solutions with observations and state-of-the-art AI for sustainable competitiveness and policy making*".

In preparation of the next Multiannual Financial Framework, the European Commission started working on the revision of the EO Strategic and Research Agenda, which the EuroGEO community will be asked to contribute to.

Over the past two years, EuroGEO has progressed beyond expectations. The implementation plan the consortium prepared with the whole community gives clear directions.

Discussions are taking place to prepare the next phase of EuroGEO, resources are mobilised from within the European Commission, and from the community.

2.2 Future EO: Youth, Startups & Innovation Showcase

Integrating Earth Observation (EO) into policy and society requires novel perspectives, bold approaches, and the development of inclusive innovation ecosystems.

Across Europe, a growing community of young professionals, early-stage entrepreneurs, and dynamic innovation networks is actively developing EO-based solutions that address pressing societal and environmental challenges. However, the question remains: how can we fully harness their potential?

This roundtable session will examine the role of EuroGEO in supporting the next generation of EO innovators. It will explore how EuroGEO, as a forum for coordinating policy and programme activity at national and European level, can serve as a strategic enabler, facilitating the growth, scaling, and sustainability of youth- and startup-driven EO initiatives.

The discussion will highlight successes, key challenges and unmet needs faced by emerging EO actors, with the aim of identifying actionable measures that can be integrated into the EuroGEO Implementation Plan to better support future innovation, collaboration, and impact.

2.2.1 Facilitator

- Graham Turnock, Eurisy

2.2.2 Speakers

- Jakko de Jong, Spheer
- Andrei Bocin-Dumitriu, DotSpace
- Stanisław Lewiński, Space Research Centre of The Polish Academy of Sciences
- Kim Regnery, Space Generation Advisory Council

2.2.3 Guests

- Renata Michalczyk, teacher,
- Sławomir Filipiuk, teacher,
- Martyna Michałowska, student,
- Michał Bednarek, student.

2.2.4 Session overview

Integrating Earth Observation (EO) into policy and society requires novel perspectives, bold approaches, and the development of inclusive innovation ecosystems. Across Europe, a growing community of young professionals, early-stage entrepreneurs, and dynamic innovation networks is actively developing EO-based solutions that address pressing societal and environmental challenges. However, the question remains: how can we fully harness their potential?

“Engage youth and startups, showcase next-generation EO innovation, and identify how EuroGEO can better support emerging actors in the EO ecosystem.”

This focus aligns seamlessly with the GEO post-2025 strategy, which emphasizes the need to increase participation of young people in the development of Earth Intelligence.

Continuing its commitment from previous years, Eurisy was invited to design and moderate a dedicated session exploring how emerging actors can shape the future of Earth Observation (EO). The session centred around three key questions:

- How can students, young professionals, and innovation networks actively contribute to advancing the EO sector?
- How can EuroGEO scale up these initiatives to maximise their impact?
- How can these efforts be integrated into a broader vision for a new era of Earth Intelligence—one that prioritises inclusion, cooperation, and equity?

2.2.5 Discussions

The panel was divided in two parts: the first one, bringing voices from diverse backgrounds and areas of expertise to identify challenges, share insights, and spark meaningful discussions with the audience.

Graham Turnock, Secretary General of Eurisy, opened the session by emphasising the strategic importance of engaging the next generation in Earth Observation (EO). He reaffirmed Eurisy's commitment to this mission through its outreach activities and projects such as SpaceSUITE and the GEO Academy.

Kim Regnery (Netherlands), national contact for the Space Generation Advisory Council, highlighted the value of youth communities and networks in guiding students and young professionals toward EO careers. She stressed the role of hackathons and competitions in gamifying education and skill development.

Jakko de Jong, from the Dutch startup Spheer, addressed the existing skills gaps in the EO sector and discussed the transformative potential of artificial intelligence in broadening access to space data and empowering EO professionals and users alike.

Andrei-Bocin Dimitru, dotSPACE representative, presented the organisation's latest activities, focusing on innovative projects training and empowering students and young professionals. Working across three key areas—innovation, capacity building, and technology transfer—he emphasized the importance of developing a common language between research and policymakers. He highlighted how SpaceSUITE is helping to bridge gaps in curricula within the downstream space sector and stressed the need to move from data to meaning—transforming information into intelligence. He also underlined EuroGEO's potential role as an innovation ecosystem supporting this vision.

Stanisław Lewinski from the Space Research Centre of the Polish Academy of Sciences introduced the Local Earth Observation Observatory (LEOO) of Poland, a scientific group founded in 2024 by students from Emilia Plater High School in Biała Podlaska, following their concept presentation at EuroGEO 2024 in Kraków. Deeply engaged in EuroGEO, Stanisław supports and collaborates with the EuroGEO Action Groups. The LEEO students began their work by creating a local environmental database, using EO to address real-world challenges while developing AI skills in their daily activities.

Stanisław noted that while EO already tackles many societal challenges, the key barrier remains competence. He highlighted the need to help local governments use EO data without requiring AI expertise, stressing that trust, accessibility, and exposure are essential to ensure EO tools are adopted in practice. He argued that if EO remains too technically complex, its societal uptake will remain limited, and that initiatives like EuroGEO and EGW can play a crucial role in developing the necessary skills and supporting creative policy innovation.

The second part of the panel featured the LEOO team on stage, including professors Renata Michalczuk and Sławomir Filipiuk, along with students Martyna Michałowska and Michał Bednarek. They shared their journey, key milestones from the past year, and the wide range of activities and events they have taken part in.

2.2.6 Specific recommendations to EuroGEO

- The development of a creation of schools-based citizen science observatories as pioneered by LEOO.
- Integrate citizen science and youth engagement as key pillars.
- Engage young people through proposal participation, hackathons, and “innovation sandboxes” — safe spaces for public bodies and startups to co-test EO/AI solutions under harmonised procurement and data-sharing rules.
- Provide innovation support to embed EO skills within EuroGEO, focusing on data platforms, early-stage entrepreneurs, policy, and procurement. For example, the need to integrate the outputs of Erasmus initiatives such as spacesuite into the educational ecosystem.
- Build an ecosystem that nurtures youth, talent, and imagination.



2.3 Prospective R&I – Copernicus SRIA

This session invited participants to engage in parallel discussions aligned with the Copernicus Strategic Research and Innovation Agenda (SRIA). Each Parallel session explored how the EuroGEO community can contribute to advancing R&I priorities. The objective was to identify concrete community contributions, strategic partnerships, and synergies with EU and national initiatives. Outcomes would feed into the EuroGEO Implementation Plan, guiding future coordination, investment, and operational efforts across the EO value chain.

- What concrete contributions can the EuroGEO community make to support the Copernicus SRIA priorities?
- What partnerships, initiatives, or projects should be mobilised or created?
- What synergies are possible between national, European, and global efforts? What operational and governance mechanisms are needed to scale and mainstream innovations?

2.3.1 AI for Earth Intelligence

The session focused on the topic of AI for Earth Intelligence and brought together four speakers working in Earth Observation and AI, with a slant towards Earth system and climate modelling as examples of front-runner application domains.

The speakers covered international organisations, the private sector, NGOs and research, and link to European projects and programmes such as Horizon Europe and Destination Earth. The session was moderated by Vincent-Henri Peuch (ECMWF) and included presentations followed by a panel discussion and audience interaction.

2.3.1.1 Moderator

- Vincent-Henri Peuch, European Centre for Medium-Range Weather Forecasts (ECMWF)

2.3.1.2 Speakers

- Mihajela Črnko, International Research Centre on Artificial Intelligence (IRCAI, under the auspices of UNESCO)
- Sara Hahner, European Centre for Medium-Range Weather Forecasts (ECMWF)
- Lisa Broekhuizen, Arthur van der Meer, Space4Good
- Tomislav Hengl, OpenGeoHub Foundation, Open Earth Monitor project

2.3.1.3 Session overview

The session aimed to highlight how AI is advancing Earth system modelling, climate intelligence, and sustainable development applications. It linked key initiatives such as Horizon Europe, Destination Earth, and Open Earth Monitor, showing the cross-sector collaboration needed to scale AI-based EO services for societal and environmental benefit.

Mihajela Črnko (IRCAI) presented the mission of IRCAI as a UNESCO Category 2 Centre focused on AI for Sustainable Development. She highlighted the role of AI in governance, ethics, and global cooperation

frameworks such as the EU-LAC Digital Alliance (2025–2027). Projects included the SDG Observatory, the AI for Equity Challenge, and the NAIXUS network connecting AI and the Sustainable Development Goals.

Sara Hahner (ECMWF) introduced ECMWF's AI-based Earth system modelling efforts within Destination Earth. She discussed the Artificial Intelligence Forecasting System (AIFS), which delivers data-driven deterministic and ensemble forecasts in minutes, and the ANEMOI open-source framework for AI models. Results showed improved skill compared to traditional physics-based models for variables like surface temperature and tropical cyclone tracks.

Lisa Broekhuizen (Space4Good) showcased the company's use of AI and EO data for real-world environmental and humanitarian impact. Projects included carbon farming (EU Inno4CFIs), biodiversity monitoring in rainforest ecosystems, forest classification in the Western Balkans, and food insecurity prediction through AI-driven early warning systems. Their approach bridges research innovation with practical applications in forestry, agriculture, and ESG monitoring.

Tomislav Hengl (OpenGeoHub Foundation) presented the Open-Earth-Monitor, an EU Horizon project developing open-source, pan-European and global EO data services. This monitor integrates datasets such as the Landsat archive (1997–2024), global ensemble digital terrain and land cover maps, and drought and reforestation monitoring products. The project emphasizes open data, reproducibility, and integration with the Copernicus Data Space Ecosystem.

2.3.1.4 Discussions

Limited discussion took place, only a few questions were asked, mainly about technical developments.

2.3.1.5 Specific recommendations to EuroGEO

No specific recommendations were made, as limited discussion took place.



2.3.2 Empowering Europe's competitiveness through in-situ data

This session explored the pivotal role of in-situ data in enhancing Europe's competitiveness, with a focus on its strategic application across research, innovation, and operational Earth observation (EO) programmes such as Copernicus. Following an introduction by the European Environment Agency (EEA), three key dimensions were presented: an overview of research and innovation projects developing in-situ technologies for hard-to-reach or under-sampled areas; the long-term perspective of Research Infrastructures (RIs); and the implementation of the EU High-Value Datasets Regulation by the European public sectors, which is expected to significantly expand the open availability of essential in-situ observations and data. Speakers from the research, academic, and public sectors illustrated how in-situ data is being applied in practice and its potential for broader, scalable impact.

The session concluded with a panel discussion bringing together project leaders, industry experts, and Member State representatives to consider how coordinated in-situ data efforts can drive innovation and economic growth in an increasingly complex and competitive global landscape. The discussion was aimed at producing actionable recommendations to guide the planning of future EO activities, including within the next Multiannual Financial Framework (MFF), and to support the development of effective routes to market. These outcomes are also intended to contribute to strengthening the in-situ components of key European and international initiatives, including the Group on Earth Observations (GEO), the Copernicus programme, and the EC-ESA Earth System Science Initiative—acknowledging the critical need for robust in-situ observation networks as a complement to space-based systems. Together, these insights aim to shape a unified European strategy to fully leverage in-situ data for digital transformation, environmental sustainability, and long-term competitiveness.

2.3.2.1 Moderator

- Jose Miguel Rubio and Jean-Philippe Aurnambout, European Environment Agency (EEA)

Presentations from the research, academic, and public sectors will illustrate how in-situ data is being applied in practice and its potential for broader, scalable impact.

2.3.2.2 Speakers

- Jose Miguel Rubio, European Environment Agency (EEA)
- Mikhail Sofiev, Finnish Meteorological Institute (FMI)
- Marlies van der Schee, Royal Netherlands Meteorological Institute (KNMI)
- Eija Juurola, Aerosols, Clouds, and Trace gases Research Infrastructure (ACTRIS)

2.3.2.2.1 Jose Miguel Rubio Iglesias (EEA)

Competitiveness has become the driving force behind today's European strategy, particularly in the context of fostering innovative technologies and ensuring effective regulation of high-value EU datasets. Within this framework, in-situ data play a crucial role, serving as indispensable inputs for satellite calibration and validation (CalVal) and for the continuous improvement of environmental models and algorithms. These data are collected from a wide variety of sources, including international and European networks, national monitoring systems, as well as contributions from research institutions and private companies. The governance of in-situ data in Europe is entrusted to designated entities that ensure coherence, reliability, and interoperability across these multiple contributors. At the center of this system, the European Environment Agency (EEA) holds a pivotal coordinating role, overseeing the Copernicus in-

situ component to guarantee that the data infrastructure effectively supports the broader objectives of the Copernicus Programme and the European data strategy.

2.3.2.2.1.1 Key points

- In-situ data are facing several well identified issues ranging from access condition, spatial and time coverage, network sustainability, long term historical time-series, fragmentation and heterogeneity, citation and fast and increasing demands

2.3.2.2.1.2 Key message

- Need of a Copernicus in-situ strategy beyond 2027 to strength in-situ data provision supported by a high-level framework to ensure long-term EU strategy for in-situ data

2.3.2.2.2 *Mikhail Sofiev, Finnish Meteorological Institute (FMI)*

Focus on lowering the cost of in-situ measurements from capital cost, deployment up to maintenance to improve time and space coverage for hard-to reach under-sampled areas.

Challenges address new instruments such as drones and in-situ measurements such as lidars regarding low-cost sensors system integration strategy supported by machine learning for operationalization, and sustainability. The 2024 GAW WMO UN report n° 293 (<https://lnkd.in/dq3MeGPY>) points out the potential of low-cost sensor systems as a technical trade off to fill the gap of enhancing the density of the networks in support of effective decision making. The report underpins the importance of quality control as well as operation and maintenance for such low-cost sensors. The EC funded project SYLVA exemplifies such challenges for bioaerosol measurements by lidars vertical bioaerosol profile real time data bringing attention to European research infrastructures including Actris, Eumetnet or CAMS. Validation, interoperability and synchronization with satellite data for operationalization and sustainability are key challenges as well.

2.3.2.2.3 *Marlies van der Schee, Royal Netherlands Meteorological Institute (KNMI)*

This presentation introduced the impact of the high value datasets from the open data directive from a national and international perspective and how it could impact users or the private sector.

Since 1951, the World Meteorological Organization (WMO) has provided essential regulatory guidance and global telecommunication services that facilitate the sharing of meteorological data worldwide, even though these activities operate without a formal legal framework. In parallel, the European Open Data Directive seeks to strengthen the EU data economy by promoting the re-use of public sector information for both commercial and non-commercial purposes. This is achieved through policies that encourage open access via APIs and machine-readable formats, ensuring greater interoperability and innovation potential across sectors. Within this evolving landscape, high-value datasets—such as numerical weather prediction (NWP) outputs, early warnings, near real-time observations, as well as radar and climate data—are recognized as critical assets that underpin scientific progress, public safety, and economic development throughout Europe and beyond.

2.3.2.2.3.1 Challenges

- No standards or interoperable formats were initially defined

2.3.2.2.3.2 Mitigation

- KNMI was a precursor by sharing 47 datasets available via API on the KNMI Data platform supported by standard and interoperable procedure including
 - Notification via MQTT protocol



- OGC API EDR with CC-BY license
- Available in the National GeoRegister platform
- The EC/EUMETNE funded project RODEO as developed user interface with various APIs running in the ECMWF European Weather Cloud

2.3.2.2.3.3 Impact for users

- Enabling higher availability increases the value and the re-use of weather data and products like in European Meteogate and Meteoalarm initiatives supporting weather warnings available as well in Google Search.

2.3.2.2.3.4 Key messages

- The EU Open Data Directive gave a legal framework to for National Meteorological Services to provide open access to meteorological data
- The RODEO project gave the opportunity for National Meteorological Services to develop interoperable products between partners

2.3.2.2.4 *Eija Juurola, Aerosols, Clouds, and Trace gases Research Infrastructure (ACTRIS)*

ACTRIS (Aerosol, Clouds and Trace Gases Research Infrastructure) is a European Research Infrastructure that provides the scientific community with access to high-quality remote sensing and in-situ data, as well as a range of services and specialized facilities dedicated to atmospheric research. It plays a central role within the ENVRI Community, a broader cluster that brings together 26 research infrastructures or communities across four major environmental domains, fostering collaboration and coherence among Europe's environmental observation systems. Beyond its European dimension, ACTRIS operates as an international collaborative network, contributing to the development of an integrated global observing strategy that supports improved understanding of atmospheric processes and strengthens the collective capacity to address environmental and climate challenges worldwide.

2.3.2.2.4.1 Challenges

- Preserving scientific data is a shared responsibility to ensure that scientific data are supported by sustained investments and coordinated protections involving the scientific community, policy makers and funders
- Example of such challenges arise in the EC funded KADI project aiming at addressing Africa climate change issues

2.3.2.2.4.2 Key recommendations from KADI project

- Strengthen observation networks and link in-situ, satellite and model data
- Empower local actors in data collection and service design with a focus on youth and local institutions
- Capacity building on data management and analysis
- Promote FAIR principles and open science
- Ensure sustainable funding with long-term investment models



Panel discussion bringing together project leaders, industry experts, and Member State representatives to consider how coordinated in-situ data efforts can drive innovation and economic growth in an increasingly complex and competitive global landscape.

2.3.2.3 Panel discussion

- Usue Donezar, European Environment Agency (EEA)
- Mark Noort, HCP International
- Jeroen Degerickx, Flemish Institute for Technological Research (VITO)
- Steven Allen, ICEYE Oy

The discussion addressed the European landscape and international context:

- How do you see the in-situ data landscape for Earth Observation evolve in Europe?
- What are the current opportunities from new developments and political priorities?
- In light of the current geopolitical situation, do you see or expect any change in the trend towards open data?
- Regarding in-situ, we build a Ferrari but use it for shopping. There is a need to go one step beyond by developing capacity to do prediction and to look back in time and ensure in-situ data are fit for purpose. It is key to prepare an in-situ data strategy.
- Continue the work on low-cost weather stations and try to generate revenues for some use-cases.
- The production of operational services in Copernicus Agriculture need in-situ curation and integration with satellite data.
- Derived products from SAR radar constellation of the ICEYE Finish company use in-situ data.
- Research Infrastructures are increasingly engaged with the whole EO landscape. Gaps can be addressed with in-situ data. Need for data security and more FAIR alignment.

2.3.2.4 Specific recommendations to EuroGEO

What role could EuroGEO and its community play in participating to ensure in-situ long term sustainability and empower Europe's competitiveness?

- Africa Met agency aims at cooperating while working with MOU and restricted policies. Progress should be made to overcome such barriers. African countries follow EU regulations and EuroGEO could help to advocate in that respect. There is a need to bring more African colleagues to events such as the EuroGEO workshop.
- In-situ data is the wild west. No harmonization is formally built on the top of such activity. There could be a role played by EuroGEO to help adopt a more top-down approach enforcing standards, interoperable and quality aspects.
- Working with Public Private Partnership (PPP) has proven to drive any kind of innovation. Frequently, innovation started with graduate projects. EO domains relies extensively on in-situ data in support for example to SNS (Social Network Services) providing support to the end-users e.g. first responders in flooding emergency management. Funding mechanisms are key to develop innovation projects to push the technology.

- Standards help communities, but they are not perceived as the core of their contribution.
- From a Research Innovation perspective there is a need to create forums to reach out to the community and get impactful discussion.
- The biggest challenge is machine learning / AI. “Lack of information is not a reason for not distributing it”. Open data opens very interesting possibilities but a better and clear separation from open data vs privately owned company data is desirable. EuroGEO could help bring underneath data to the surface.
- Under-represented regions are tackled by ICOS. OEM project provides cyberinfrastructure to in-situ with catalogue.
- Continuous reoccurring question about densifying African/European networks. We should think of more creative ways to address it as a lot of investment has already been spent. Could we provide a Copernicus long-term mechanism in collaboration with the countries? Could we provide incentives for companies to release their measurements?

2.3.3 Infrastructure, Standards & Interoperability

Europe is deploying several infrastructures such as GDDS, EOSC, DestinE, etc. EuroGEO should promote the adoption of common standards to facilitate data sharing, discovery, reuse, and integration across various European Earth Observation initiatives. Standardization efforts address metadata, data formats, quality requirements, and data curation processes to ensure that in-situ and remote sensing data are interoperable and conform to user needs aligned with environmental and climate policy goals.

In addition EuroGEO should include in its mission the promotion of technical, semantic, and organizational interoperability to enable seamless data exchange and integration across multiple platforms and stakeholders. EuroGEO supports the GEO DS-DMP principles and stimulates action groups to harmonize efforts and encourage interoperability to maximize the use of Earth observation data across Europe and within GEO global networks.

2.3.3.1 Moderator

- Joan Maso Pau, Research Centre on Ecological and Forestry Applications (CREAF)

2.3.3.2 Speakers

- Piotr Zaborowski, Open Geospatial Consortium Europe (OGCE)
- Tom Hengl, OpenGeoHub
- Mark Dietrich, Bloodstone Consulting
- Danae Puechmaille, European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)
- Kaori Otsu, Centre for Ecological Research and Forestry Applications (CREAF)
- Paola de Salvo, GEO Secretariat

2.3.3.3 Discussions

As an introduction, the Chair raised the issue of some platforms or components disappearing (namely, the GEO portal) from the ecosystem. With the GEO shift to the GEO Knowledge hub, the question remains if interoperability is a concern for the knowledge packages. Also, with great investments in the EO platforms, they tend to be satellite focused, and little has been done for the in-situ data interoperability.

OGC presented the vision that the interoperability standards are based on the core; community standards and their extensions should be complementary as long as they share common elements from the nucleus ones. It also raised the issue of trust in the high attention in the industry on machine learning and wider 'artificial intelligence', and the great responsibility of the community for reliable and verifiable data/information.

OEP presented the OpenEarthPlatform and the OpenLandMap foundation contribution to the shared open EO data portfolio. The use of the openly available tools and standards exploiting mostly cloud friendly data formats were presented as the ready-to-use resources compatible with the ideas of a federated ecosystem. An interest in the DGGS standards and processing was also raised as an emerging solution. He underlined the importance of storytelling around the use cases as an important and not sufficiently covered area.

Sage (Mark) and the Green Deal Data Space embrace open and non-open data, while the stronger focus is on the solutions that could unlock the potential of the non-open data. The idea of connectors was presented as portable and interoperable components that enable data exchange between trusted entities and groups. An important horizontal activity of Sage is the integration to named cloud infrastructures like EOSC, AI factories, and data hubs like EMODNet, INSPIRE portal, and EEA.

EUMETSAT(Danaele) presented the Destination Earth Data lake (DEDL) as the flagship of the DestinE with a growing number of data sets available from Copernicus Services, onboarded projects, JRC, ISIMIP, and computing capabilities, including virtual environments with GPUs. The audience was interested in the presented concept of the 'AI-ready' data, which is now implemented as the programmatic framework.

The integration with the federated cloud of EOSC nodes was also extended with the CREAM (Kaori) talk, which presented both interoperability frameworks on data and governance. It mentioned several projects that shall contribute to the EOSC portfolio as thematic nodes with data, workflows, and infrastructures. Interest in both specific initiatives like ENVRI and EOSC in general, was mentioned by the other speakers and audience as the potential follow-up.

Finally, GEO (Paola) presented the proposal of the GIDTT architecture of the GEO infrastructure that would be based on the GEO Data Access Broker and GEO KnowledgeHub, with the additional components like GEOGPT that will use recent AI tools (namely Language Models) to leverage the potential of the collected data and knowledge. Discussion circled around the governance model, and the EuroGEO community was suggested as a relevant contributor to the framework with the help of the GEO Sec.

2.3.3.4 Specific recommendations to EuroGEO

In general, the session brought quite a wide picture of the multiple initiatives providing platforms for data and services, as well as integration activities. Both the hubs and their extensions were presented. Most of the connections are based on interoperability frameworks, with standards as a common reference and not one overarching architecture.

The workshop has shown interest in the European platforms development while also showing several overlaps in the platform-to-platform integrations. To facilitate effective results, it is important to continue not only the dialogues on the roadmaps and synergies but also technical work on the cross-platform interoperability, enabling exploitation of the commons.

EuroGEO is in a position to support the promotion of the technical, semantic, and organizational interoperability to enable seamless data exchange and integration across multiple platforms and stakeholders. EuroGEO, in the past, supported the GEO DS-DMP principles and stimulated the action groups' work to harmonize efforts and encourage interoperability to maximize the use of Earth observation data across Europe and within GEO global networks. While the recommendations seem valid in most of the presented approaches, they can be widely adopted at a high level. On the platforms-to-

platform integrations, it is a project-based effort that needs continuity. On the other hand, many of the platforms presented similar standards used on the technical level, while not many common semantic references were mentioned explicitly. Therefore, more work on interoperability is expected to bring benefits to the synergies of the progression of the integrations that could be scaled beyond systems.



2.3.4 Beyond EO: driving action and delivering value with integrated Earth Intelligence

Understanding the value and socio-economic benefits of Earth Intelligence and EO-based solutions is not necessarily easy, but crucial in order to ensure the societal relevance and long-term continuity of these solutions. Through different projects and initiatives, this session will aim to explore how EO is creating impact, supporting policy and sustainable development. It will also explore a set of tools designed to support impact assessment and discuss needs in this area.

2.3.4.1 Moderator

- Geoff Sawyer, European Association of Remote Sensing Companies (EARSC), GEO VALUE

2.3.4.2 Speakers

- Geoff Sawyer, European Association of Remote Sensing Companies (EARSC), GEO VALUE
- Thomas Kemper, European Commission's Joint Research Center, GEO Human Planet
- Sry Handini Puteri, United Nations Food and Agriculture Organisation (FAO)
- Antonella Passani, T6 ecosystems

2.3.4.3 Discussions

2.3.4.3.1 *Thomas Kemper, European Commission's Joint Research Centre, GEO Human Planet*

The GEO Human Planet initiative aims to understand the human presence on the planet with open geospatial data. Turning them into actionable intelligence to inform climate action, disaster risk reduction and the SDGs.

It is a global partnership leveraging advanced Earth observation, geospatial data and statistics to deliver policy-relevant insights across multi-sectoral thematic areas. For example, it combines a satellite image, with built-up area information and census data to provide population grids, degrees of urbanisation and settlement dynamics.

This type of initiative informs SDG monitoring, the Copernicus Emergency Management Service, international policy frameworks and others.

The GEO Human Planet is:

- Global collaboration
- Co-designing open and actionable data on human settlements globally
- Focus on data integration of EO and non-EO data
- Driving global policy and sustainable development

Beyond EO? On one hand, looking at population dynamics and on the other hand, combining EO with census data and other types of data.

2.3.4.3.2 Sry Handini Puteri, United Nations Food and Agriculture Organisation (FAO)

FAO uses geospatial information too for: land cover and crop monitoring, agroecological zoning and land evaluation, ecosystem restoration and land degradation monitoring, emergency and resilience (e.g. GAEZ, WaPOR).

Projects/programmes are evaluated at the FAO according to a set of pre-defined criteria (which projects are evaluated?) and steps (how do they evaluate). The latter includes internal and external stakeholders, identifying the levels of intervention and beneficiaries, desk research and interviews, a SWOT analysis and the TOC framework.

From their projects they see different levels of users and therefore beneficiaries, from the policymakers to the farmers/end users, passing through managers/thematic authorities.

Beyond EO? Providing benefits to local population (different level of users)

2.3.4.3.3 Antonella Passani, T6 ecosystems

The SDGs-EYEs project has built a portfolio of decision-making tools that monitor SDG indicators based on Copernicus data and services for a variety of pilots in Europe and beyond.

The use of EO has an impact on several levels including: improved indicators to help develop better policies that have a positive impact on citizens and the environment; more timely, accurate and efficient data; direct and indirect cost saving.

To maximise uptake and impact, the project recommends: promoting open standards, adopting co-design, developing user-friendly cloud platforms, strengthening collaboration with local agencies and research bodies, pursuing open-source/open-data approaches.

2.3.4.3.4 Geoff Sawyer, European Association of Remote Sensing Companies (EARSC), GEO VALUE

GEOValue is an enabling mechanism within the GEO WP, which aims to establish a widely accepted and broadly adopted capacity for the assessment of Earth observations impacts, based on technically valid methods and resources.

A GEO Impact Assessment Toolkit (GIAT) has been developed which supports the GEO community to provide evidence about the impact/success of the initiative, stimulate a reflection on the value of EO in GEO initiatives and increase awareness of GEO benefits for funders.

The next steps for GEOValue are to validate GIAT with GEO experts and test/refine the toolkit with GEO initiatives. For 2026/2027, publish the fully functional GIAT and promote its uptake.

2.3.4.4 Audience discussion

2.3.4.4.1 Issue of users/policymakers trusting data

The influence of AI can raise even further questions of trust and transparency (quality check of in public procurement). This is difficult to tackle: how far can we go with AI explainability? Methods are so complex, it remains superficial.

- For the GEO Human Planet, the users are policymakers, so they deliver products/Earth Intel that can be easily explained (perhaps lower accuracy, but higher trust and buy-in)
- In SDGs-EYEs, and T-6's work in general, they see that sometimes it's worth "sacrificing" the complexity/resolution of the solutions to ensure buy-in, to have something that is more easily explainable.

2.3.4.4.2 Evaluating impact at GEO level:

Some participants expressed the view that using the GEOVALUE methodology should be mandatory within the projects – stakeholders always ask what's the value of GEO (also applicable to Horizon projects).

Already foreseen somehow in the Post25 programme but could perhaps be somehow promoted or even made mandatory.

Where should discussion be in 2026?

- The results of the GIAT test analyses
- Understanding the impact of the GEO Human Planet initiative

2.3.4.4.3 Evaluating impact of EU-funded projects

The three project presentations were very complementary covering different types of projects, public and private stakeholders and drivers. Each discussed the impacts of their projects although none has so far undertaken any structured impact assessments. All expressed interest to undertake such an assessment, possibly using the GIAT presented by Geoff Sawyer in the fourth presentation.

- Evaluation of impact should be in the concept of a project, but it is difficult to implement because of the different ways of financing.
- Impact assessment at EU level is done on the programme level, not project level -room for improvement (timing, methodology, etc.), to better capture impact.

2.3.4.5 Specific recommendations to EuroGEO

- EuroGEO can act as a community to build trust and “social capital” for different Horizon/EU-funded projects.
- EuroGEO has potential for transversal activities (impact, exploitation), where we can build synergies across projects, which could be a role for the Action Groups (e.g., capacity building – inspired by GEOVALUE)

2.4 Technical sessions

2.4.1 Communication at the Heart of EuroGEO: Shaping a Connected and Collaborative EO Ecosystem

Communication is not just a support function — it is a catalyst for connection, collaboration, and impact. At its core, the Earth Observation community is a diverse and multidisciplinary network, encompassing scientists, data providers, technologists, policymakers, private sector innovators, educators, media and civil society. However, this diversity can also lead to fragmentation: different actors may operate separately, speak different "languages" (scientific, technical, policy), or be unaware of each other's efforts and breakthroughs.

2.4.1.1 Moderator

- Aspasia Trevlaki, Head of EuroGEO Communication, National Observatory of Athens

2.4.1.2 Speakers

- Marina Guillen, Policy Officer, European Commission, DG RTD
- Jasper Wamsteker, Head of Communication and Education, Netherlands Space Office (NSO)
- Alexandre Brecher, Action Creative Content Lead, iClimateAction Project
- Hans van Leeuwen, Scientific & Strategic Project Leader, PCP-WISE project
- Alan Mandrillon, Space Projects Manager, SPACE4Cities & VALORADA projects

2.4.1.3 Session overview

This session aimed to explore the central role of strategic communication in building a vibrant, inclusive and collaborative EO community by uniting this ecosystem and creating shared understanding, common goals, and a sense of collective identity and purpose.

It also showcased how an open EuroGEO connects and unites, helping to amplify the visibility of Europeans' EO's contributions to solving pressing societal challenges - from climate resilience to sustainable development.

2.4.1.3.1 Perspective of Aspasia Trevlaki, Head of EuroGEO Communication, National Observatory of Athens

Aspasia Trevlaki's presentation highlighted the central role of communication as the driving force connecting the EuroGEO ecosystem. Emphasising that communication is not a support function but the engine that unites the Earth Observation (EO) community, she showcased how strategic storytelling, engagement, and shared purpose can foster an open, inclusive, and impactful network under the vision of *OneEuroGEO* avoiding fragmentation, bridging diverse "languages" (scientific, technical, policy), and ensuring awareness of each other's efforts and breakthroughs.

Drawing on data from recent European media and science communication studies, she underlined both opportunities and challenges in conveying EO achievements to wider audiences. While television remains Europe's main news source, social media is gaining traction — offering new spaces for visibility and engagement. At the same time, the need for clarity, simplification, and effective translation of scientific content was stressed as essential for meaningful outreach.



Aspasia illustrated how the EuroGEO communication strategy embodies the principles of the 3Cs — *Combine, Coordinate, Cooperate* — bridging disciplines, connecting initiatives, and amplifying Europe's EO voice. She presented EuroGEO's growing communication ecosystem, featuring over 40 success stories, an active newsletter community, and impactful audiovisual storytelling that brings science closer to citizens.

Her concluding message reinforced the importance of moving from individual messages to a shared EuroGEO story, activating the Action Groups as ambassadors, and turning communication into collective intelligence — transforming coordination into collaboration, and collaboration into lasting impact through an established network of European project communicators, ensuring consistent reporting on EuroGEO and, subsequently, formulating the European communication contribution to GEO.

2.4.1.3.2 Perspective of Marina Guillen, Policy Officer, European Commission, DG RTD

Marina Guillen emphasised the essential role of communication in demonstrating impact. She highlighted the need to convey tangible results and practical solutions not only to researchers but to society at large. EO should be communicated as a tool for monitoring and protecting society and the environment, rather than merely observing the stars. She called for a stronger effort to tell this story effectively.

2.4.1.3.3 Perspective of Jasper Wamsteker, Head of Communication and Education, Netherlands Space Office (NSO)

Jasper Wamsteker highlighted that the narrative of space has evolved significantly over the last two decades. He stressed the need to explain the entire space landscape to different audiences, including children, scientists, policymakers, students, and the media. The growing focus on the end-users raises critical questions: Who is the end-user? What defines them, and how can they be effectively reached? He noted that if user demand drives EO uptake, there is a significant communication challenge ahead. Jasper emphasised that communication should not focus solely on showcasing data capabilities but on understanding and engaging with the audience. His favourite quote, *"Writing is thinking with the mind of the other person,"* captures this principle: knowing the audience, their challenges, and the language they speak is key, alongside active listening.

2.4.1.3.4 Perspective of Alexandre Brecher, Action Creative Content Lead, iClimateAction Project

Alexandre Brecher observed that funding cuts often affect communication first, which hampers the dissemination of good news stories. He noted audience fatigue regarding climate change and the fragmentation of communication efforts, which reduces collective impact. He proposed strategies for more effective communication:

- **Collaboration:** Pool limited capacities by working together.
- **Simplification:** Present narratives in a clear and understandable way.
- **Identification:** Make the audience relate to the people and work in the field.
- **Amplification:** Coordinate outreach to media to maximise visibility and impact.

2.4.1.3.5 Perspective of Hans van Leeuwen, Scientific & Strategic Project Leader, PCP-WISE project

Hans van Leeuwen shared PCP-WISE's communication strategy, built over eight months of intensive sessions and one-to-one meetings. The project focused on building buyer and user communities and constructing storylines from their daily situations, which were then used to build business cases and evaluations. He highlighted the need to integrate and tailor communication to different audiences to address their specific needs.



2.4.1.3.6 *Perspective of Alan Mandrillon, Space Projects Manager, SPACE4Cities & VALORADA projects*

Alan Mandrillon presented communication strategies for both projects:

- **SPACE4Cities** (national level): Collaboration with NSO, France Space Agency, relevant ministries, and national Horizon contact points; translation of tenders into national languages; publication of an 'Innovation Catalogue.'
- **VALORADA** (climate adaptation): EO provides a powerful means to visualise and analyse complex data. However, perception of risk and understanding economic impacts are more effective in driving municipal action. Clusters play a crucial role in enabling targeted and effective communication.

2.4.1.4 Discussions

2.4.1.4.1 *Is it possible to have a single communication strategy for all end-users, or are tailored strategies needed for each group?*

- **Aspasia Trevlaki:** One size does not fit all. Strategies must be tailored for each audience group, but an overarching umbrella vision is essential to avoid fragmentation.
- **Alexandre Brecher:** Emphasised that one organisation should take the lead in defining the overall framework. He highlighted the importance of having a structured conversation, a clear roadmap, and accountability. EuroGEO successfully applied this approach, demonstrating its effectiveness.
- **Jasper Wamsteker:** Strategies should remain simple and relatable. Storytelling is key: stories should be recognisable and easy to understand. Collaboration is crucial to achieve this.
- **Marina Guillen:** Effective communication starts with defining the story. Only then should the audience be considered, and the language adapted accordingly.

2.4.1.4.2 *Are there educational programmes aimed at children that tell these stories in a simple, engaging way?*

- **Aspasia Trevlaki:** Training young people in schools is critical, including teaching media literacy, understanding fake news, and evaluating content critically.
- **Jasper Wamsteker:** Highlighted the "Space Goes to School" project in Netherlands, in which professionals visit schools to deliver short lessons on space topics. The project also develops materials for primary and secondary schools to support teachers.

2.4.1.4.3 *How can we reach individuals who are sceptical about climate change?*

- **Aspasia Trevlaki:** Emphasised the importance of authenticity, using science and data, and providing clear overviews of ongoing phenomena.
- **Alexandre Brecher:** Stressed the importance of combating disinformation and providing accessible tools to educate audiences with facts and data. Simplification is key, e.g., through websites and educational infrastructures.

2.4.1.5 Specific recommendations to EuroGEO

The session concluded with a series of concrete recommendations to further strengthen EuroGEO's communication strategy and its role within the global GEO framework:

- Move from individual messages to a shared One EuroGEO voice, activating the Action Groups as ambassadors avoiding fragmentation and bridging diverse “languages” (scientific, technical, policy).
- Turning communication into collective intelligence — transforming coordination into collaboration, and collaboration into lasting impact through an established network of European EO projects' communicators with REA's support, facilitating exchange and networking, ensuring the visibility of shared achievements and subsequently formulating the European communication contribution to GEO.
- EuroGEO should continue serving as a platform to share success stories and positive narratives of all Key actors of the European EO community, showcasing Europe's collective impact in Earth Observation through its main communication channels (website, social media, E-News).
- EuroGEO should continue strengthening collaboration with the GEO Communication Team through joint communication actions, shared content, and coordinated participation in international events.
- The EuroGEO communication team expressed its hope that this first dedicated communication session will become a recurring feature in future EuroGEO Workshops and GEO Forums, providing a platform where communicators' voices can be heard showcasing their expertise and exchanging best practices on the science communication field.



2.4.2 EuroGEO as a Bridge: Connecting Research, Private Sector, and Policy for Sustainable Impact

This session examined the importance of EuroGEO as a platform to bridge scientific and EO private sector communities, ensuring that EO private sector data and services are accessible to and supporting European research, and that research outcomes are transformed into operational solutions supporting European and global policy priorities, including the Sustainable Development Goals. The discussion focused on:

- Bridging communities: Facilitating collaboration between research/ academia and the private sector, highlighting different perspectives and aligning with the SRIA.
- Operationalisation challenges: Moving from research outcomes to integrated, usable solutions for end users and policymakers.
- Integration of research outcomes: Ensuring scientific solutions are effectively embedded into policy and societal applications.
- Mutual benefits and reuse: Exploring how both communities can generate shared benefits, including commercial opportunities and contributions to sustainable development (e.g., SDGs-Eyes).
- Role of the private sector: Identifying who provides information to reporting parties and how research and services can contribute.
- Access to data: Addressing the need to facilitate data access for research applications, including the relevance of high-resolution data for SDG monitoring.

2.4.2.1 Moderators

- Tanya Walker, European Association of Remote Sensing Companies (EARSC)

2.4.2.2 Speakers

- Anica Huck, European Space Imaging
- Luis Filipe Lages, NOVA School of Business & Economics
- Fiona Smith, Statistics Netherlands
- Maude Perier-Camby, vortEX-io

2.4.2.3 Discussions

2.4.2.3.1 *Fiona Smith, Statistics Netherlands*

Fiona explained that at CBS, the production pipeline for EO-based insights is primarily developed in-house, with models created mainly to ensure data quality/quality control. These insights integrate data from Copernicus, ESA, and National Statistical Office (NSO) data portals. CBS' work builds on initiatives such as the **AIML4OS** project, which develops reusable AI/ML pipelines for official statistics across eight countries using the Copernicus Data Space Ecosystem, and the GEOS 2023–2025 series, focusing on land use, biodiversity, and air quality. Through these projects, CBS not only produces operational EO-based statistics but also contributes to developing common European methodologies, promoting cross-border collaboration, and advancing the use of Earth Observation in official statistics.

2.4.2.3.2 Anica Huck, EUSI

VHR data were initially used mainly for verification purposes but have now become a key topic in research. EUSI has a 23-year archive with 30 cm resolution coverage of Europe available for multiple thematic applications. DLR and GEO are focusing on settlement projects using these data, which are interoperable and can support missions such as Sentinel-2. Access is possible through Copernicus, offering high temporal resolution. While the main limitation remains the high cost, VHR data are increasingly important for research and innovation projects under Copernicus, ESA third-party missions, and pre-operational services. EUSI is raising awareness on this, with potential interest and support expected from the European Commission.

2.4.2.3.3 Maude Perrier, Vortex-io

In situ data can significantly enhance the use of Earth Observation by providing ground-based validation and complementary information. A network of sensors monitoring water types across Europe supports several projects, including **FloodCare** and a **Digital Twin with ESA** focused on hydrological services. In situ data also supply historical records for research and help validate parameters such as river water temperature, which are crucial for addressing emerging environmental issues. However, greater public involvement is needed, as engagement at the local level particularly in flood management remains limited compared to the broader initiatives.

2.4.2.3.4 Luis Filipe Lages, NOVA School of Business & Economics

First, innovation only creates value when it is recognised and, whenever applicable, paid for by the market; second, bridging research and business should not be the final step of a project—it should be the entire journey from day one. If Europe wants to maintain its innovation momentum and competitiveness, it must invest in connecting science, business, and policy, ensuring R&D impacts both society and the market.

Despite strong EU support, too many EO projects stop where they should start, often because proposals allocate limited attention and budget to go-to-market activities, commercialisation, stakeholder engagement, and business modeling. To change this, we need to balance tech-push with market-pull from day one, ensuring research meets real user needs, private firms are involved in co-creation, and business and policy expertise is integrated alongside R&D.

To foster stronger partnerships, Europe needs a shared vision and governance among consortium partners, institutionalized co-creation and interdisciplinary teams, market- and commercialization-oriented research incentives, and structured frameworks like the Value Creation Wheel (VCW) to align diverse stakeholders.

2.4.2.4 Audience discussion

Luis mentioned the concept of “coopetition” — a blend of cooperation and competition — highlighting how research institutions and the private sector often work on similar initiatives. This overlap can create both synergies and challenges, as collaboration is needed to advance innovation, yet competition naturally arises when both sides pursue comparable goals. He also noted that policy tends to lag behind these dynamics, struggling to keep pace with the evolving landscape of collaboration and competition in the sector.

2.4.2.5 Specific recommendations to EuroGEO

EuroGEO should be a platform that bridges the communities together, especially the private sector that it's the most difficult to reach to make the step from research to market. A clear example of how the private sector is engaging with EuroGEO to enhance this cooperation is EUSI that is working with the EuroGEO Action Group to share HR data for their members.

3 National GEOs & Implementation

The final day turns to national coordination and implementation. Starting with an official segment from the Netherlands, the sessions explore how EuroGEO can support countries in organizing their contributions to GEO and increasing the uptake of Earth Intelligence, through enhance coordination, governance structures, joint action plans, and stakeholder engagement. Examples from across Europe shed light on best practices and potential improvements. The National GEO session features national space capabilities in the Netherlands, strong partnerships and real-world applications. In the afternoon, a closing session brings together insights from Action Groups and Member States, helping shape the next steps of the EuroGEO Implementation Plan and reaffirming Europe's role in the global GEO community.

Welcome statement by Afke van Rijn, Ministry of Infrastructure and Water Management

Ladies and gentlemen, esteemed colleagues, and valued guests,

As Director General for Environment and International Affairs at the Ministry of Infrastructure and Water Management, it is both an honour and a pleasure to welcome you to the third day of the EuroGEO Workshop 2025. I would like to extend an extra warm welcome to all of whom have travelled from far to join us here. I am inspired to see such a committed and diverse group gathered here, all striving to advance the field of Earth intelligence.



I would also like to thank EuroGEO and the Netherlands Space Office for organizing this three-day workshop. It is greatly appreciated that the Netherlands is seen as a valuable partner in this field, and it underscores the important role of the Netherlands Space Office in the Dutch space sector.

The theme of this year's workshop, "Earth Intelligence," resonates strongly with the work and ambitions of my ministry. Smart mobility, climate adaptation, and building a sustainable and healthy living environment are at the forefront of our agenda. Earth observation and satellite data are indispensable tools in meeting these challenges. They provide us with the necessary information to keep our infrastructure resilient, and to safeguard the livability and adaptability of the Netherlands.

To illustrate our commitment, let me share two examples of two Dutch earth observation initiatives:

We are a pioneer in developing satellite instruments that monitor atmospheric emissions. A prime example is TROPOMI, which has been delivering critical data on global air quality for years. In the near future, TANGO will succeed this instrument, enabling us to map emissions with far greater precision.

We also use satellite data for both immediate crisis response and long-term predictive water management. For example, we monitor the stability of our flood defenses against subsidence by integrating satellite technology with locally derived data. Additionally, we track the sargassum blooms in the Dutch Caribbean to protect our overseas coasts.

These examples highlight how earth observation is driving innovation and supporting societal needs in the Netherlands. But we know that the challenges we face are not confined by borders. Whether we are addressing climate change, securing food supplies, or preserving biodiversity, our societies encounter similar hurdles. This is why international collaboration is so crucial. Therefore I want to emphasize the

importance of this EuroGEO event. Only by joining forces—sharing expertise, resources, and data—we empower each other to find innovative solutions that benefit all.

The Netherlands is deeply committed to harnessing the power of satellite data for societal good. In this spirit, the Ministry of Infrastructure and Water Management and the Netherlands Space Office, have initiated the establishment of a Dutch Secretariat for EuroGEO. This initiative underscores our dedication to both national progress and international partnership.

Hosting the EuroGEO Workshop this year is a true honour for the Netherlands and I would also like to thank the Netherlands Space Office for hosting this event. It provides a welcome opportunity to bring together the Dutch earth observation community with our European colleagues, fostering new connections and inspiring fresh perspectives.

I encourage you all to make the most of today's program. Share your experiences, and seek out new collaborations and I am confident that today will be filled with meaningful exchanges and innovative ideas.

Thank you for being here, and I wish you all an inspiring and productive day ahead.



3.1 National Engagement in EuroGEO

This session explored how national initiatives are shaping the coordination and uptake of Earth Observation first within the EuroGEO framework and then in the broader context of GEO. The discussion highlighted the role of Member State representatives, such as those from Germany and the Netherlands, also actively contributing to the coordination of Earth Observation at national, European and global levels. The discussion examined how European initiatives such as Copernicus and Horizon Europe are driving national level EO coordination and uptake. Using examples such as ECMWF's uptake strategy, the session addressed the role of national governance structures, including National Contact Points, in aligning national efforts with EuroGEO. Representatives from National GEO shared experiences and good practices in organizing their GEO efforts, engaging stakeholders, and aligning priorities with both European and global GEO agendas.

3.1.1 Moderators

- Emmanuel Pajot, European Association of Remote Sensing Companies (EARSC)

3.1.2 Speakers

- Cristina Ananasso, European Centre for Medium-Range Weather Forecasts (ECMWF)
- Jens Danzeglocke, German Aerospace Center (DLR)
- Coco Antonissen, Netherland Space Office (NSO)
- Sara Venturini, GEO Secretariat

3.1.3 Discussions

From the first part of the panel, addressing how national initiatives are shaping the coordination and uptake of Earth Observation.

3.1.3.1 Cristina Ananasso, European Centre for Medium-Range Weather Forecasts (ECMWF)

ECMWF's uptake strategy focuses on enhancing user intelligence by increasing understanding of users at the national level, listening to their needs, and providing concrete responses whenever possible. National user events, co-organised with local institutions, serve as a key mechanism to engage with stakeholders and collect user needs and requirements, which can be both technical or scientific, as well as related to processes and actions to be implemented. These strong needs have driven ECMWF to strengthen its dedicated actions for training and to develop the National Collaboration Programme, supporting cooperation with Member States to ensure broader adoption of Copernicus-based assets.

The Copernicus User Forum (CUF) and the network of National Collaboration Programme (NCP) contact points play a key role in aligning national and European priorities. For the Copernicus Atmosphere Monitoring Service (CAMS) and the Copernicus Climate Change Service (C3S), CUF representatives have served as important entry points at the national level, facilitating communication and coordination. The NCPs contact points act as national references for specific thematic areas, such as in Italy and Spain, helping to bridge local initiatives with the broader European framework. In this context, EuroGEO could

serve as a collaborative platform that further connects national efforts, fostering coherence and shared objectives across Europe.

3.1.3.2 Jens Danzeglocke, German Aerospace Center (DLR)

Germany has been a GEO member since the beginning and has leveraged the “GEO push” to advance data sharing and the use of geoinformation and Earth Observation at the national level. Today, GEO is seen as adding an international dimension to what Copernicus represents for Europe, highlighting the importance of international cooperation in addressing global challenges and supporting multilateral goals such as the SDGs. The Framework Partnership Agreement on Copernicus User Uptake (FPCUP) is cited as a success story—providing EU funding to support bottom-up initiatives for Copernicus user uptake.

However, with the end of FPCUP there remain gaps that EuroGEO could help fill: taking into account new satellite missions to come and the growing need of national and local authorities for efficient solutions to problems such as climate adaptation, environmental reporting obligations etc., support to national user uptake is key. Since GEO can be complex to communicate to national users, who often struggle to see how to engage, EuroGEO could also serve as an effective bridge between the national and global GEO levels, facilitating alignment and cooperation across scales.

3.1.3.3 Coco Antonissen, Netherland Space Office (NSO)

GEO Netherlands Secretariat connects different activities that the NSO is already doing in the Netherlands in terms of innovation projects, knowledge networks (industry, governments, research), satellites/data & users. Value in GEO/EuroGEO is to connect the different levels. There are lots of activities happening, which can be put under the umbrella of GEO Netherlands to connect to European level. Currently, NSO works under the ministries of Economic affairs, infrastructure and water management and education, culture and science. However, the ministries of defence and foreign affairs got involved more actively in recent years. All of these ministries together wrote a long-term space agenda back in 2023, for the first time in history. This has now also led to a high-level steering committee in which all these ministries are involved. Although this is not only for EO uptake but for the national space strategy as a whole, this high-level involvement of 5 ministries (for now) will ensure EO intelligence across a wide range of government organizations.

3.1.3.4 Sara Venturini, GEO Secretariat

Across the GEO community, National GEOs are rapidly emerging as central drivers of Earth intelligence, evolving from simple data coordination mechanisms into service-oriented ecosystems that transform Earth observation data into actionable insights for policy and planning. Their diversity and adaptability illustrate the added value of GEO as a flexible, country-led framework, supporting national priorities while connecting them to regional and global systems. National GEOs are increasingly fostering cross-ministerial collaboration, ensuring that EO data informs decisions across key sectors such as climate adaptation, biodiversity protection, agriculture, and disaster resilience. They are also developing operational interfaces that align with both national and thematic priorities, drawing on GEO methodologies and standards to bridge science, technology, and policy.

Examples from countries such as Germany, the Netherlands, the UK, Greece, Italy, and beyond Europe, e.g. Canada, China, the United States, South Africa, and Japan, demonstrate how well-structured National GEOs can align policy, data infrastructure, and stakeholder engagement. The most effective ones embed Earth observation within national policy frameworks, establish governance mechanisms that link ministries and agencies, and connect national systems to regional and global initiatives such as Copernicus and the GEO Knowledge Hub. These models show how National GEOs can serve as platforms for innovation and coordination, providing a shared foundation for translating Earth observation data into tangible national outcomes.

Within this context, Europe is particularly well positioned to lead this transformation, leveraging its strong national GEO networks, the EuroGEO framework, and flagship programmes such as Copernicus, Destination Earth, and Horizon Europe. These programmes already embody GEO's principles of openness, co-production, and collaboration, making Europe a natural demonstration region for the integrated Earth intelligence ecosystem envisioned in GEO's Post-2025 Strategy. Strengthening vertical integration between Member States, EuroGEO, and the global GEO agenda, while promoting cross-regional learning with AfriGEO, AmeriGEO, and AOGEO, would further solidify Europe's leadership in translating scientific excellence into practical benefits for people and the planet.

From the GEO Secretariat's perspective, strengthening collaboration requires both institutional mechanisms and practical enablers that sustain dialogue, capacity, and co-design across all levels. This includes institutionalising joint planning and coordination, expanding peer exchange through communities of practice linking regions, and improving stakeholder engagement through tailored policy dialogues and communication tools. Investing in user-driven pilot projects will also be key to demonstrating impact and fostering ownership. Taken together, these actions will help build a more connected, co-owned GEO ecosystem, where national experience informs regional collaboration, regional action advances global priorities, and the entire GEO community works collectively toward a sustainable, inclusive, and data-driven future.

3.1.4 Inputs from audience

Key discussion from the voice includes the fragmentation across regional GEOs and EuroGEO, among who will reuse the outcomes at the end of the EuroGEO initiative. EuroGEO vertical and horizontal integration brings interregional learning with other regional GEOs.

The discussion highlighted fragmentation among regional GEOs and EuroGEO, particularly regarding how outcomes will be reused after the EuroGEO initiative ends. The GEO Secretariat stressed that EuroGEO's vertical and horizontal integration fosters interregional learning, while Jens noted that EuroGEO, like Copernicus, mirrors national structures and must maintain dialogue with Member States.

National perspectives, such as from the Netherlands and Germany, underlined that GEO, EuroGEO, and Copernicus are tools to meet national priorities, though overlaps exist due to differing mandates. A concrete example is that Germany noted challenges in linking space-oriented policies with institutional and local users' needs. Germany has two parallel coordination streams for historical reasons, leading to overlaps between GEO and Copernicus activities. At the European Commission level, Earth Observation is currently linked to the space economy and space uptake, which does not always align with Copernicus's core users, which are institutional users, for whom the space economy is less relevant. End users, particularly at the local level, face specific challenges that cannot be addressed starting from a "space-first" perspective; instead, engagement should begin by understanding their needs and demonstrating practical applications of Copernicus and Earth Observation. This remains a significant task, especially at the local scale.

The GEO Secretariat also mentioned that a GEO Innovation Fund is being discussed as a proposed new funding mechanism within GEO, supporting to accelerate new initiatives or scale up existing initiatives, such as the Global Ecosystems Atlas, GEOGLAM, etc. Participants agreed there is no need for separate tracks for Copernicus and GEO user uptake; instead, a co-developed, common approach should connect European, national, and local levels.

Finally, ECMWF emphasized the value of a common strategy but stressed the importance of maintaining flexibility to adapt to diverse national contexts—something currently enabled by the National Contact Points.

3.1.5 Specific recommendations to EuroGEO

Many countries are currently “reinventing the wheel,” and EuroGEO could play a key role in scaling up successful practices. Its top-down approach, covering funding, visibility, and user uptake from the national to the European level, can complement the bottom-up initiatives already underway.

EuroGEO could strengthen cross-regional collaboration and capacity building by establishing structured exchanges with AfriGEO, AmeriGEO, and AOGEO to share methodologies, best practices, and lessons learned. This could include joint training programmes, communities of practice, and peer-to-peer learning platforms connecting European experts with counterparts in other regions, thereby reinforcing GEO’s global cohesion and Europe’s leadership in advancing inclusive, capacity-driven Earth intelligence.



3.2 National GEO for the Netherlands

The session “National GEO for the Netherlands” focused on the development of GEO Netherlands and how it connects the Dutch Earth Observation (EO) community to EuroGEO. Moderator Mark Noort (HCP international) introduced the session and explained that while EO technology is rapidly advancing, the real challenge lies in translating data into informed decision-making and actionable advice. The discussion aimed to explore expectations and priorities of both public and private stakeholders, identify challenges, and discuss solutions for stimulating EO adoption in the Netherlands.

3.2.1 Moderator

- Mark Noort, HCP international

3.2.2 Speakers

- Elena Spolidoro, Policy Advisor Digital Agriculture, Ministry of Agriculture, Fisheries, Food Security and Nature
- Lianne Wilmink, Strategic Information and Innovations Advisor, Ministry of Infrastructure and Water Management
- Eric van Valkengoed, CEO, Terrasphere
- Kees van Duijvendijk, Netherlands Space Office (NSO)

The session was structured as a moderated panel discussion with alternating questions for public-sector representatives (Elena and Lianne), private sector representative (Eric), and a national space agency representative (Kees), followed by questions from the audience.

3.2.3 Discussions

3.2.3.1 Adoption of EO and digital tools remains difficult in policy and operational contexts

- *Elena Spolidoro* noted that the Ministry of Agriculture will invest in showing the relevance of digital and EO solutions to improve uptake.
- *Lianne Wilmink* highlighted that EO data is often not trusted because it lacks integration with in-situ data, which policymakers consider essential for verification and reliability.
- Trust and user engagement were recurring themes. Both ministries emphasized that policy makers need to trust EO-based products before using them in official monitoring or reporting processes.

3.2.3.2 GEO Netherlands as a connector

- *Kees van Duijvendijk* explained that GEO Netherlands exists to address the diverse needs of stakeholders. It is a co-creation platform aiming to build a national EO community that connects public, private, and research actors.



3.2.3.3 Practical experiences and success stories

- *Eric van Valkengoed* shared insights from the G4AW programme: one example in Bangladesh became a successful operational EO-based service. However, he stressed that success depends on starting from a real user question rather than pushing technology-driven solutions.

3.2.3.4 Audience contributions

- *Ellis Nijhuis (ITC)* questioned how Dutch ministries plan to leverage strong EO capacities at institutes like ITC and Wageningen. *Kees* responded that collaboration will happen through co-creation and events such as EO4Impact, and there is a clear need for more regional activities across the Netherlands.
- *Frank Helmink (KNMI)* emphasized the importance of “early warning” applications for resilience, noting that this topic should remain central in GEO Netherlands discussions.
- *Nick van der Giessen (TU Delft)* asked whether GEO Netherlands includes in situ data. *Kees* confirmed it does, with *Eric*, *Lianne*, and *Elena* agreeing that combining EO and in situ data is essential for accuracy and policy relevance.
- *Hans van Leeuwen* stressed the importance of involving users from the start to ensure long-term commitment.
- *Tamme van der Wal (Aerovision)* remarked that EO networks can seem like “old boys’ networks” and asked how GEO Netherlands connects to other communities. *Elena* and *Lianne* explained that ministries are building thematic communities (e.g., around water management and digital agriculture) that can be linked to GEO Netherlands.
- *Andy McGarry (SES)* raised the issue of reluctance to share in situ data. *Lianne* and *Elena* explained the challenges surrounding data confidentiality, ownership, and the new EU Data Act, which creates uncertainty on what data can legally be shared and used. *Eric* confirmed that farmers are often resistant to external data use without clear agreements.
- *Pieter van Beekhuizen* asked whether GEO Netherlands is engaging with banks and insurance companies. *Kees* replied that this outreach is planned for the near future.
- *Floor Crispijn* suggested reflecting on how other networks progress and using them as mirrors to guide GEO Netherlands’ development.

3.2.3.5 Specific recommendations to EuroGEO

3.2.3.5.1 Continue the EuroGEO annual workshop

- Maintain this event as a key platform for exchange and collaboration. Dedicate time in each edition to clearly explain what GEO, EuroGEO, and national GEO secretariats are and how they relate to each other. This helps new participants understand where they fit and how to engage.

3.2.3.5.2 Strengthen co-creation and community building

- Encourage national GEOs to facilitate regular events (like EO4Impact) throughout their countries to involve diverse user groups and link public, private, and academic actors.



3.2.3.5.3 Integrate in situ and EO data efforts

- EuroGEO should promote best practices and tools for combining EO and in situ data, helping to build trust and enhance data reliability for policy applications.

3.2.3.5.4 Enhance communication and trust-building

- Support initiatives that demonstrate EO's added value through clear, user-oriented examples that resonate with policy makers and local users.

3.2.3.5.5 Support cross-sectoral collaboration

- Facilitate dialogue between ministries, research institutes, and private stakeholders to leverage national expertise and capacities in EO applications.



3.3 Space Applications: from research to operations

3.3.1 Water management

There are many challenges pertaining to water management, including increasing demand, climate change, deteriorating environmental conditions, decreasing water availability, decreasing water quality and increased risks, such as floods, droughts and salinisation. The Netherlands has always been strong in knowledge and innovation in relation to water resources management. This session focuses on how Earth observation, ranging from in situ measurements to satellite data, helps improve water management, with examples from the Netherlands.

3.3.1.1 Moderator

- Nick van de Giesen, Delft University of Technology

3.3.1.2 Speakers

- Marit Van Oostende , VU
- Annelies Hommersom, WaterInsight
- Han Qianqian, University Twente
- Evelyn Aparicio Medrano, FutureWater
- Bram Schnitzler, HydroLogic
- Lianne Wilmink , Ministry of Infrastructure & Water Management
- Ype van der Velde, VU
- Zeng, Yijian, University Twente

3.3.1.3 Session overview

The organiser of this session was the Knowledge Network Water (KNW, <https://kennisnetwerkwater.nl/>), which is sponsored by the National Space Office. KNW brings together companies, academia, and water managers in the Netherlands around remote sensing of droughts, water quality, and floods.

- The chairman of the KNW, Nick van de Giesen (Delft University of Technology), gave a general introduction on the topic.
- Marit van Oostende (Free University) and Annelies Hommersom (Water Insight) gave presentations on water quality.
- Han, Qianqian (University Twente), Evelyn Aparicio Medrano (FutureWater) and Bram Schnitzler (HydroLogic) presented on drought.
- Lianne Wilmink (Ministry of Infrastructure and Water Management) presented on Earth observation for water management and uptake by user groups.



The recommendations and possible topics for further research and innovation of the presenters can be found in the last section of these notes.

3.3.1.4 Discussions

There was room for some technical questions, here are the main points.

- On uptake by users: some applications are difficult to use (complexity, specific skills required), it is better to have dummy demonstrations that have a low threshold.
- Exchange at municipality level is needed e.g. for digital twins.
- Exchange at the level of water boards is also useful.
- The point was made that this is similar to activities that JRC does for the EC DGs in terms of use of Earth observation.
- Bring together users and let them talk to each other, complementary to connecting researchers and users.
- Technology push is not a dirty word, but should be balanced with a pull from the market / potential users.

3.3.1.5 Specific recommendations to EuroGEO

Marit's presentation on Earth observation for water quality highlighted methods to determine water quality in the Netherlands, which is below the WFD ecological target. Her recommendations are:

- Work together with waterboards.
- High revisit, with high resolution is useful, e.g. PlanetScope SuperDove enables daily, ~4 m data.
- Earth observation must be validated and calibrated with in situ data.

Annelies highlighted the importance of combining satellite data with in-situ observations for water quality, with examples related to chlorophyll monitoring, harmful algal blooms, dredging plumes and phytoplankton monitoring for shellfish.

Qianqian discussed the application of two drought monitoring indices and stressed the importance of Earth observation for drought research in his presentation on drought analysis for the Netherlands.

Evelyn presented on Earth observation for sustainable water management, with an example on drought monitoring. Her challenges / recommendations were:

- Coupling Earth observation Indicators to policy and regulations.
- Make Earth observation interpretation accessible for a wider audience.
- Provide incentives to the public and private sector to apply EO services operationally.

Bram presented the National Information Service Soil Moisture and Evaporation (LBIV) that integrates various information products, including satellite-based ones, resulting in applications for e.g. water extraction compliance, dike monitoring and flooding.



Lianne demonstrated how Earth observation data and policy for water management can be connected, with use cases on e.g. water quality, drought and low flow models, water bodies and reporting. Her recommendations for bridging science and policy are:

- Integration – Combination is key for success.
- Usability is important – Data alone is not enough!
- Ask the right questions.
- Enhance and improve continuously.
- Collaboration is crucial.



3.3.2 Soil management

Earth Observation is playing an increasingly important role for the monitoring of soil degradation, soil health, planning better soil management but also for monitoring soil ecosystem services including soil carbon sequestration. Some key indicators of soil health include: (1) Presence of soil pollutants, excess nutrients and salts; (2) Soil organic carbon stock; (3) Soil structure including soil bulk density and absence of soil sealing and erosion; (4) Soil biodiversity; (5) Soil nutrients and acidity (pH); (6) Vegetation cover; (7) Landscape heterogeneity, and (8) Forest cover. Sentinel 1/2 satellite images, Landsat and similar can be used to quantify bare surface soil, tillage intensity, even bare surface spectra, and then used to predict key dynamic soil properties such as soil carbon, soil nutrients, soil pH, water content and salinity. Digital Terrain modeling is used to simulate hydrological and soil forming processes. The speakers are world leaders in producing and distributing soil information and making sure soil information is used across borders. The discussion panel will focus on how to turn EO products into operational soil management monitoring systems.

- Introduction to the session and objectives
- SoilSuite: pan-EU and global soil monitoring products based on Copernicus Sentinel
- Dynamic soil property mapping 2000–2024 using spacetime Machine Learning vs process-based modeling
- GeoLDN national and regional projects
- How can EO data directly help improve soil management?

3.3.2.1 Moderator

- Tom Hengl, OpenGeoHub

3.3.2.2 Speakers

- Paul Karlshöfer, DLR
- Xuemeng Tian, OpenGeoHub
- Davide Consoli, OpenGeoHub
- Antje Hechteljen, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- Ingrid Stob-Jansen, Rijkswaterstaat

3.3.2.3 Session overview

The speakers were world leaders in producing and distributing soil information and making sure soil information is used across borders.

- Paul Karlshöfer (DLR) presented the SoilSuite (https://geoservice.dlr.de/web/datasets/soilsuite_eur_5y).
- Xuemeng Tian and Davide Consoli (OpenGeoHub) presented the Soil Health Data cube (<https://shdc.ai4soilhealth.eu>) and the global soil data (<https://world.soils.app>);
- Antje Hechteljen (GeoLDN, GIZ) reviewed the GeoLDN national and regional projects.

The discussion panel focused on how to turn EO products into operational soil management monitoring systems. Slido was used to collect feedback from participants (anonymously). Summary results of the discussion panel are given below. There were about 70 participants at the session.

3.3.2.4 Discussions

Participants believe that only a minority of landowners or farmers actually use Copernicus Sentinel data for managing soils / making decisions. Out of 28 votes, 57% believed that less than 1% of European farmers use open Copernicus Sentinel Data to manage their soils. Only 18% of respondents believed that this proportion could exceed 5% of European farmers.

The discussion went around who is to blame for such limited uptake — is the technology too complex or still unfit? Are EO data companies too pricey? Are farmers aware of the potentials of technology at all? Most participants were interested in “Best practices guidelines for using EO data for soil management” and to receive a review of current and cutting-edge tools and data to support soil management. When asked to rank Which EO/geospatial data types should be listed as high priority for soil monitoring and management? The respondents put soil spectroscopy (in-situ) and soil moisture / above- below-ground biomass annual fluxes the highest.

Although SoilSuite, Soil Health Data Cube and World.Soils.app are already advanced soil data products (fine spatial resolution 10–30 m, global to pan-EU coverage, high Analysis-Ready level), there is still a lot of work to enable millions of users (farmers, land owners, forest managers, spatial planners, civil engineering companies) to use such soil data in daily decisions. Most importantly, the European Commission through the [Mission Soil platform](#) is investing significantly (around 1 billion EUR) into making better and more usable soil data and soil monitoring technologies. This investment in soil research could practically revolutionize how we measure, use and make decisions using soil data.

3.3.2.4.1 Data Usage and Requirements

- Frequently Used Geospatial Data includes Sentinel 2 (from GEE, S2, PDOK), Sentinel 1, SAR, VHR, PlanetScope, EnMAP, aerial photos, and Ground truthing photos.
- Preferred Methods for Interacting with Large Geospatial Datasets:
 - Download data, open in QGIS (44%).
 - Using on-line map viewers (40%).
 - Google Earth Engine (36%).
- Finest Temporal Resolution Required: The most common requirement is Weekly (38%). The next highest is 1-7 days (17%).
- Minimum Spatial Resolution (Ground Sampling Distance) Required: The most frequent requirements are 10-30 m (36%) and 1-5 m (28%), tied with 5-10 m (28%).

3.3.2.4.2 High Priority Data for Soil Monitoring (Ranked)

1. Soil spectroscopy (in-field) (Score: 2.13).
2. Above- below-ground biomass annual fluxes (Score: 1.46).
3. Soil moisture from Sentinel 1 or similar (Score: 1.42).

3.3.2.4.3 Policy and Perception (Rating Polls on a 1=Strongly Disagree to 5=Strongly Agree scale)

- Need for a single harmonized public cadaster: Strong agreement (Score: 4.5). 79% of respondents chose '5' (Strongly agree).
- Land ownership and management should be private and confidential: Mild disagreement/neutrality (Score: 2.8). The highest percentage of votes were for '1' (Strongly disagree) and '3' (Neutral), both at 25%.

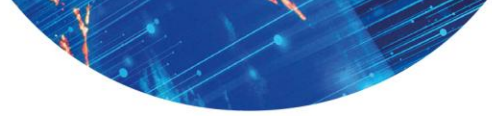
- Public interest is more important than land owners' interest: Agreement (Score: 3.7). The highest vote was '5' (Strongly agree) at 34%.
- Farmers should be financially rewarded for SOC increase/decreasing degradation: Strong agreement (Score: 4.2). 58% of respondents chose '5' (Strongly agree).

3.3.2.4.4 Farmer Use of Open Copernicus Data

- Respondents estimate that a very small percentage of the 9 million farmers in Europe use open Copernicus Sentinel data for soil management.
- The largest single group of responses (39%) estimated the usage to be <0.2%.
- A majority (77%) estimated usage to be <5% (39% for <0.2%, 18% for 0.2-1%, 11% for 1-2%, 9% for 2-5% - based on the numbers provided).

3.3.2.5 Specific recommendations to EuroGEO

1. **High Need for In-Situ and Advanced EO Data:** Soil spectroscopy (in-field) is ranked as the single highest priority data type for soil monitoring, surpassing other remote sensing data like Sentinel-1 moisture. This highlights a perceived critical need for high-fidelity, ground-level information to complement satellite observations.
2. **Broad Geospatial Data Adoption but Preference for Desktop GIS:** While a variety of remote sensing sources are frequently used (Sentinel-1/2, VHR, SAR), the most popular way to interact with large datasets remains the traditional method of downloading and using local GIS software (QGIS), slightly ahead of cloud platforms like Google Earth Engine and online map viewers.
3. **Demand for High Spatial and Temporal Resolution:** The community requires frequent updates, with weekly temporal resolution being the most common need. The need for high spatial detail is also clear, with 1-5m, 5-10m, and 10-30m resolutions dominating the requirements.
4. **Strong Public Interest and Policy Support:** There is overwhelming support for a single, harmonized, public cadaster (Score: 4.5). Furthermore, the community generally believes the public interest is more important than that of landowners (Score: 3.7), and strongly supports financial rewards for farmers engaging in beneficial soil practices (Score: 4.2).
5. **Minimal Farmer Uptake of Open Data:** The poll reflects a perception that the direct use of open Copernicus Sentinel data by European farmers is extremely low (majority estimate <0.2%). This suggests a significant gap in translating open EO data into direct, end-user applications for the farming community.



3.3.3 Sustainable agriculture and food security

Feeding a growing population, doing so sustainably while taking into account the effects of climate change is an enormous challenge. This session focusses on the achievements of two initiatives that address this issue at different scales. The first is the GEO Global Agricultural Monitoring flagship (GEOGLAM), which monitors agricultural conditions and provides global yield estimations for four major crops. The second is the Geodata for Agriculture and Water programme (G4A), which facilitated the provision of satellite-based information for smallholder farmers to increase income, reduce costs and make them more risk-resilient.

3.3.3.1 Moderator

- Parya Pasha, ITC, University of Twente

3.3.3.2 Speakers

- Jens Danzeglocke, DLR, Program Manager Copernicus Applications and GEO in Germany
- Andy Nelson, ITC, University of Twente, GEOGLAM Capacity Development
- Usue Donezar Hoyos, EEA, Copernicus Land Monitoring
- Anne-Sophie Doerfel, BMV, Federal Ministry for Digital and Transport Germany
- Peter Hoefsloot, Hoefsloot Spatial Solutions
- Steven Wonink, eLeaf
- Evelyn Aparicio Medrano, Future Water

3.3.3.3 Session overview

This session explored how Earth Observation (EO) applications are contributing to sustainable agriculture and food security, addressing the dual challenge of feeding a growing population while adapting to climate change. It brings together national and international perspectives to demonstrate the value of coordinated GEO initiatives and EO-based services.

3.3.3.4 Session objective

Highlighting the strategic value of investing in a National GEO initiative for policymakers and stakeholders, using proven models and successful collaborations as evidence. The session also positioned Dutch partners—as key enablers of Earth Intelligence in support of national priorities such as food security, climate resilience, and innovation.

3.3.3.5 Session summary

- Parya Pasha (Faculty ITC, University of Twente) was the moderator and provided the Introduction and presentation of the objectives for the session.
- Anne-Sophie Doerfel (BMV, Federal Ministry for Digital and Transport Germany) and Jens Danzeglocke, Program Manager Copernicus Applications and GEO in Germany (DLR) showcased Germany's implementation model for its National GEO initiative.
- Andy Nelson, (Faculty ITC, University of Twente), presented ITC's contributions to initiatives like GEOGLAM and G4AW, and its strategic position as a neutral intermediary between government and industry. He has also proposed similar role and structure for the GEO Netherlands initiative.



- Usue Donezar Hoyos, Copernicus Land Monitoring (EEA) presented the Copernicus Land Monitoring Service (CLMS) and how they contribute to preparing products and services for the sustainable agriculture and food security.
- Peter Hoefsloot (Hoefsloot Spatial Solutions) presented Earth observation-based grazing opportunities and water information services to pastoralists in the Sahel region and highlighted the legacy from their engagement in G4AW.
- Steven Wonink (eLEAF) on EO-based agriculture and water management, including global water productivity data (WaPOR) and monitoring.
- Evelyn Aparicio Medrano (FutureWater) presented integrated solutions for innovative water management, including mapping, modelling, early warning, etc. for decision support.

3.3.3.6 Discussions

Anne-Sophie and Jens provided an extensive overview of how the German national GEO is structured, highlighting national strategies (based on the German GEO implementation plan, the Copernicus strategy of the Federal Government and the National User Uptake strategy of the Federal Government), the GEO working group and the Copernicus coordination mechanism. The contribution of Germany to GEO is quite substantial and goes back a long time. The presentation showed that there is no one-size-fits-all approach to success and that organisational arrangements are also determined by historical developments.

Andy highlighted the contribution of ITC to GEO (which is also substantial) and expressed ITC's support for a GEO for the Netherlands, expressing the need for coordination at national and European level. An overview of ITC's contribution to food security was provided, focussing on making nutritious food more available & accessible, reducing risks in production, increasing resilience of food networks, protecting and securing land rights, reducing losses and waste, managing and protecting natural resources and increasing access to digital technology. An important topic is integration for policy implementation, with integration of Earth observation and in situ data, the role of the Copernicus services, FAIR data sharing and leadership and collaboration as essential elements.

Usue presented the latest developments in the Copernicus Land Monitoring Service and its National Collaboration Programme. The aim of this programme is to establish a national-level dialogue and support user uptake and it focuses on ensuring user involvement in developing the service, collecting user requirements down to sub-national level and validating the quality of CLMS products.

Peter presented the successful Garbal Sahel initiative that helps livestock farmers to find grazing opportunities in Niger, Burkina Faso and Mali. There are quite a number of success factors: the demand by farmers is very high demand (millions of calls), the service is potentially viable service through micro-payments of farmers to mobile network operators, services are offered to the most vulnerable people, discouraging migration, there is a low-cost, almost completely automated back-office for service provision, innovation such as Image-to-Text capability for call centres is applied, mobile network operators are in it for the long run and are taking over the services, local farmer organisations participate (they provide cattle prices on markets), there is a willingness to maintain the service by all stakeholders, and the technology is being transferred to the region.

Steven dealt with the topic of water scarcity, providing practical examples of the FAO WaPOR initiative (on global water productivity data), mapping irrigated agriculture in Australia and water productivity monitoring for sustainable cotton (also in Australia). Earth observation provides great opportunities, but adoption is still slow. Steven's recommendations are summarised in the next section.

Evelyn presented on Earth observation for sustainable water management, highlighting EO-based services, e.g. water resources baseline studies (water accounting), ecosystem services mapping, irrigation performance, drought early warning and services that combine Earth observation with hydrological modelling.

3.3.3.7 Specific recommendations to EuroGEO

Examples of how national GEOs are organized and exchange of experiences can help countries establish their own national GEO in a more effective, efficient and impactful way, while choosing the organizational and operational structure that is best tailored to their needs.

The following recommendations were formulated by Andy:

- A mandate for the Agriculture Action Group: Mandate the AAG to create blueprints showing research outputs can move into operational services, Practical guidelines for the R2O pipeline.
- Outsourced market support: Bring in small, lightweight support to help turn prototypes into real services. Convene researchers, SMEs, and end users in R2O pipeline sprints.
- Develop integration templates for interoperability: Develop reusable in-situ and EO blueprints for irrigation and drought monitoring. Document and disseminate tried and tested integrated solutions.
- An agriculture advocacy pack: Create materials showcasing agriculture success stories for policy audiences. #OneEuroGEO success stories to drive sustainable agriculture policy change.

For GEO Netherlands and food security the following arrangement was proposed:

- NSO provides coordination and policy alignment.
- Research institutes like ITC innovate, partner, and build capacity.
- Dutch SMEs deliver scalable and sustainable services.
- Showcasing Dutch leadership and impact in EuroGEO and GEO.

Recommendations for uptake of Earth observation by the water sector by Steven:

- Key drivers for adoption of EO-technology are outside the EO-domain: Sustainable water management policies and regulations are the main driver for stakeholders.
- Earth Observation alone doesn't create meaningful solutions for water management: A multidisciplinary approach and the integration of sectoral knowledge is essential.
- Most EO-based water management solutions are still in the R&D phase: Structural funding for water related EO-services is necessary for private sector involvement.
- Creating trust in the EO-technology will increase the rate of adoption: Earth observation-community and policies should give more attention to validation and standardization.

Evelyn's challenges / recommendations for sustainable water management are:

- Coupling Earth observation Indicators to policy and regulations.



- Make Earth observation interpretation accessible for a wider audience.
- Provide incentives to the public and private sector to apply Earth observation services operationally.



3.3.4 Urban management

Earth observation is widely used for urban management in the form of mapping, establishing data infrastructures and digital twins. This session explores how relevant EO applications can be integrated into operational services, with insights from research, industry and government perspectives. Focus will be on monitoring and managing subsidence in an urban environment, initiatives towards open data and algorithms and the establishment of urban digital twins for operational services.

3.3.4.1 Moderator

- Coco Antonissen, Netherlands Space Office

3.3.4.2 Speakers

- Joris Franssen, VRO
- Georgia Giardina, Delft University of Technology
- Reinier Oost, Sensor
- Niek Hendrik, Municipality of Alkmaar

3.3.4.3 Session overview

Joris Franssen (VRO) highlighted that digital twins must be policy-aligned and data-interoperable across sectors, with satellite data still missing to achieve full operational maturity. Integrating Earth Observation (EO) data, particularly for change detection, enables continuous monitoring and reduces the need for physical inspections. Georgia Giardina (TU Delft) demonstrated how InSAR data, combined with structural modeling, ground-settlement profiles, and cadastral information, supports damage assessment and resilience planning. Her examples showed the value of multi-source data fusion in linking EO analysis with engineering and urban design decisions. Reinier Oost (Sensor) discussed how historical EO datasets can reveal subsidence and ground-movement trends, improving failure prediction and infrastructure management. He underlined the importance of accessible user interfaces and decision-support tools to help practitioners interpret complex EO outputs. Niek Hendriks (Municipality of Alkmaar) emphasized a user-driven, participatory approach, starting from end-user needs and leveraging citizen sensors, storytelling, and serious gaming to make spatial data relatable. His perspective illustrated how combining EO insights with community engagement and urban-planning concepts like the 15-minute city and 3-30-300 rule can turn digital intelligence into tangible local action.

3.3.4.4 Discussions

The discussion explored how Earth Observation (EO) and digital twins can be scaled into reusable, interoperable city solutions, linking technical innovation with practical municipal value. Panelists agreed that InSAR data provides vital insights for correlating soil and bridge behavior, potentially informing future bridge design and maintenance strategies. Participants noted opportunities to scale up digital twin networks by developing a shared EO-digital twin “store” and promoting integration with smart city initiatives such as those showcased at Smart City Expo Barcelona and the Amsterdam infrastructure visualization programs.

Several examples illustrated tangible financial and environmental benefits: car-counting and parking management systems can save municipalities up to €10 000 annually in labor, while automated CO₂ measurements can achieve savings of up to €30 000. The “Zicht op Nederland” project was highlighted as

a promising initiative using satellite data for urban heat mapping, emphasizing the potential for climate-adaptation planning.

Discussion also focused on end-user experience, stressing the importance of simplicity and clarity — the “KISS” (Keep It Simple, Smart) principle — in digital twin interfaces such as traffic-light indicators or dashboard visualizations. Participants called for standardization, particularly in assessing foundation and building-risk data, and in ensuring that technical findings are effectively translated into actionable insights.

Examples from France, where bridge forecasting relies on in-situ data, and from Sensor, which faces challenges abroad due to limited cadastral information, underscored the value of the Netherlands’ Kadaster, recognized as groundbreaking in its completeness. The discussion concluded with a strong consensus that open data access is essential to drive innovation, while viable business models should focus on interpretation and translation of EO data into actionable intelligence for cities and infrastructure management.

3.3.4.5 Specific recommendations to EuroGEO

- Invest in high-resolution heat-mapping satellites to support accurate, timely, and localized climate adaptation planning. Improved spatial and temporal resolution will strengthen urban heat monitoring and contribute to sustainable infrastructure design.
- Launch a European cadastral initiative to harmonize and expand access to geospatial property and structural data. A unified cadastral framework would make EO-based tools and digital twin applications scalable across borders, addressing current data gaps that limit implementation outside the Netherlands.
- Develop an urban classification framework to enable systematic comparison of cities, their environmental and infrastructural challenges, and corresponding solutions. Such a framework would improve the reusability of tools, models, and policy actions, ensuring that successful local solutions can be efficiently adapted to other urban contexts.
- Promote open data access and standardization to foster innovation, transparency, and cross-sector collaboration, while maintaining a sustainable earning model based on data interpretation and actionable insights.



4 EuroGEO Action Group Recommendations for the EO Downstream Sector

The EuroGEO Action Groups presented and discussed the key R&I priorities for the downstream EO sector within each Action Group's domain, based on preparatory work done in advance. Each group would contribute directly to the EuroGEO Implementation Plan through a structured 2-pager.

It was recommended for the Action Groups to be co-chaired with the corresponding Copernicus Service. The outcomes may include a presentation from the Copernicus Service and a feedback / discussion on the evolution of Copernicus Services.

4.1 Action Group Agriculture

4.1.1 Session Chair

- Mark Noort, HCP International on behalf of Stylianos Kotsopoulos, Neuralio

4.1.2 Programme

- Welcoming and introduction to the session: concept and agenda
- Presentation on the EuroGEO AG R&I activities and priorities by Mark Noort, prepared by Action Group Leader Stelios Kotsopoulos, Neuralio
- Presentation of EO4EU by Dr. Vasileios Baousis, ECMWF
- Presentation on Crop Mapping in Ukraine by Prof. Andrii Shelestov, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" (NTUU "KPI")
- Discussion & feedback on the strategy from the audience

4.1.3 Session overview

This session brought together the members of the EuroGEO Agriculture Action Group to discuss the key R&I priorities for the downstream EO sector within the Action Group's domain, including discussion on the evolution of Copernicus Services. The Action Group will contribute directly to the EuroGEO Implementation Plan, based on preparatory work done in advance and the feedback of this session.

Mark Noort first welcomed the participants and introduced the concept and the agenda of the session, emphasising the need to collect feedback on the proposed AG strategy from the participants of the session.

Afterwards, Mark Noort gave a presentation on behalf of Stelios Kotsopoulos. He started by introducing the EuroGEO Agriculture Action Group, referring to its mission and the importance of Earth Observation in agriculture. He then focused on the Strategic Research and Innovation Agenda (SRIA) and the role of EuroGEO in shaping the SRIA. The challenges in the current Copernicus missions include the limitations of Copernicus data, the need for data augmentation and fusion, and the operational implications for agricultural end-users. Regarding the environmental extremes prediction and early warnings, there are challenges in predicting agricultural impacts. Satellite-derived indicators can be utilized for monitoring, and analytical methods can be integrated for forecasting.



Another important issue is the water risk management and hotspot identification, given the need for identifying water scarcity and excess. In this direction, EO-based water stress indices can be applied and key users for water risk management can be targeted.

Nature-Based Solutions for mitigation are crucial. High-resolution Earth Observation data can be employed to track the effectiveness of nature-based solutions, such as agroforestry and wetland restoration, by monitoring changes in vegetation cover and ecosystem health. Time-series change detection methods can be utilized to evaluate the performance of nature-based interventions, providing evidence of their impact before and after implementation. Environmental planners and local authorities are key target users who require data to support climate adaptation initiatives and assess the effectiveness of nature-based solutions in their regions.

Mark Noort underlined the importance of tailored sector-specific co-designed EO solutions that address specific challenges and requirements of different agricultural practices. Engaging sector stakeholders in the co-design process can lead to the development of effective solutions, such as crop yield forecasting and insurance products that are specifically tailored to their needs. The EuroGEO Agriculture Action Group can facilitate partnerships between developers and end-users, sharing best practices and insights to enhance the effectiveness of tailored applications in agriculture. All relevant stakeholders are encouraged to actively participate in the EuroGEO initiatives towards achieving sustainable agricultural goals and addressing global challenges.

Then Vasileios Baousis, EO4EU Technical Coordinator, gave a presentation about EO4EU, entitled “Making Earth Observation Data More Accessible Through Next-Generation Tools”. He first identified the barriers to efficient use of EO data: variety of data origins complicates integration, fragmented data landscape, challenges in locating and accessing pertinent datasets, and limited availability of tools to download and process EO data. He then explained that EO4EU enhances access to European EO data by integrating various platforms and repositories: Copernicus (CAMS, CMEMS, CLMS), DIAS, EC Initiatives like Destination Earth (DestinE), and by using interaction methods. He showcased the EO4EU platform and highlighted how AI/ML technologies are being leveraged to access and process EO data from various EU data hubs and data spaces.

He referred to the practical applications of EO4EU, focusing on the existing agriculture use cases. He presented solutions for food security, forest ecosystems, and environmental pests. The relevant stakeholders and beneficiaries include researchers and academia, citizens and scientists, policy-makers, standards development organisations, EO data providers and the private sector.

Afterwards, Andrii Shelestov (NTUU "KPI") gave a presentation entitled “Crop Mapping in Ukraine Towards EU CAP Alignment”. He presented the Crop Map for Ukraine (2016-now) developed with the support of EU and World Bank, using annual in-situ data collection and self-reporting from farmers from WB. He emphasized the cropland trend analysis 2015-2025 and the uncultivated land during the war 2022-2025. He presented the fields damage detection technology and delineation, using Sentinel-1, -2, and machine learning models for field damage assessment. The land use map in the State Agrarian Register (since 2022) is an activity supported by World Bank. The winter crop map 2025 is used in JRC MARS Bulletin. The land parcel identification system pilot was supported by JRC and World Bank in 2024.

He concluded that the mapping is reliable, given that Sentinel-1/2 with in-situ surveys and ML ensure high accuracy (>95%). The farmers' data improves crop maps (+0.5% accuracy, minority crops) but requires cleaning and standardization. The impact of the war is significant, with shifts in crop structure resulting to 6.36 M ha remaining uncultivated in 2025. The field delineation is key to improving crop classification, crop state analysis and war impact assessment. The policy relevance is important, since Ukraine aligns with EU CAP standards and enables food security monitoring in inaccessible areas.

4.1.4 Discussions

4.1.4.1 Are the farmers using the EO4EU platform?

Vasileios Baousis replied that ECMWF informs the farmers and organises raising awareness events. Moreover, CMCC has strong connections in southern Italy. Indeed, uptake is the goal and farmers are the target group.

4.1.4.2 What are the incentives for the farmers to participate in self-reporting in Ukraine?

Andrii Shelestov replied that the World Bank has a program on fertilizers, so this is their motivation.

4.1.4.3 How is it possible to achieve such a high accuracy of crop mapping in Ukraine (>95%)?

Andrii Shelestov replied that this refers to the major crops. Regarding the minor crops, there were 10.000 training points before the war, but most of them are not accessible currently; only 3.000 are now accessible. Now data is available from the self-reporting of farmers.

4.1.4.4 How does the EuroGEO Agriculture Action Group support the SRIA?

Nicola Pirrone replied that based on its rich expertise, the EuroGEO Action Groups can provide recommendations for the upcoming funding calls, to identify the key challenges and objectives for the agriculture sector, to co-design and produce useful EO-based tools and innovative services. He encouraged the involvement of all beneficiaries in an inclusive open dialogue in order to form consortia and prepare proposals for the calls.

As regards the partnerships, he suggested being in touch with the reference party on the national level (agency / ministry). The SRIA on agriculture is very complete and provides the opportunity to integrate AI and develop state-of-the-art solutions. The SRIA is a live document, to be updated every two years, so the feedback from the AG is regularly needed, following an inclusive and constructive process. Synergies and networking are necessary to ensure the integration of the legacy of past projects, both European and national ones.

4.1.4.5 Specific recommendations to EuroGEO

- Address the limitations of Copernicus data, given that current Copernicus missions encounter challenges such as insufficient spatial resolution and revisit frequency, which can limit the effectiveness of agricultural monitoring and decision-making processes.
- To enhance agricultural monitoring, there is a pressing need for data augmentation through the integration of high-resolution data from commercial satellites, as well as multi-sensor data fusion to improve all-weather coverage and reliability.
- Address the operational implications for agricultural end-users due to the limitations in data resolution and availability, necessitating enhanced data resolution for effective field-level monitoring and the coordination of pilot integrations for operational services.
- Address the challenges in predicting the impacts of environmental extremes by:
 - utilizing high-TRL EO indicators for monitoring (such as NDVI and thermal data) to detect extreme conditions before they escalate into crises, providing critical early warnings for agricultural stakeholders;

- integrating machine learning models to enhance the prediction of agricultural impacts based on historical data, with a focus on spatial and temporal resolution to improve monitoring effectiveness.
- Apply EO-based water stress indices to operationally map soil moisture and vegetation conditions, providing valuable insights into areas experiencing unusual water deficits or surpluses.
- Target water resource managers and crop insurance providers who can leverage EO data to prioritize at-risk zones for intervention and guide resource allocation effectively.
- Promote Nature-Based Solutions for mitigation and monitor their impact using high-resolution EO data and time-series change detection methods.
- Co-design innovative Earth Intelligence solutions to address existing challenges and enhance agricultural sustainability and productivity, by facilitating pilot projects for tailored applications and by supporting the EuroGEO Agriculture Action Group to foster collaboration with stakeholders to refine strategies and focus on integrating EO into policy frameworks and operational practices.



4.2 Action Group Climate

4.2.1 Session Chairs

- Kaisa Juhanko, FMI
- Rakesh Hooda, FMI
- Ali Arslan, FMI

4.2.2 Session overview

A EuroGEO Action Group meeting to present and discuss key R&I priorities for the EO Downstream Sector within the climate domain.

4.2.3 Discussions

There was a discussion on the fact that the EU climate services landscape is well-developed, and therefore the focus should not be on challenging what is already there but instead to promote downstream adoption of the Copernicus Climate Change Service. This was widely agreed on within the Action Group. Therefore, one of the main discussion points for the Action Group going forward will likely be on how to increase the uptake of EO services by stakeholders.

An example of this can also be found in the widely shared agreement on the need for additional efforts to ensure local governments are informed on and are capable of understanding and utilizing EO data. Ensuring this is possible is a major challenge and could be one of the key focus areas of the EuroGEO Action Group moving forward.

The importance of the Knowledge Center for Earth Observation (KCEO) and the importance of having such a broker between experts and EU policy makers were also noted, a relevant consideration in this context.

One of the noted challenges in increasing uptake in stakeholders is the fact that EuroGEO can struggle with reaching the final practitioners, EuroGEO first reaches the international project teams and not the day-to-day operations staff. Focusing on a better connection between EuroGEO and end-users is key. This is currently active policy, an example of this can be found in end-user stakeholder co-design, an important step in ensuring end-users are able and willing to utilize EO data, as traditional feedback loops are often not adequate or lead to missed opportunities. The importance of involving local communities (e.g. indigenous groups) was also noted by many participants.

Another widely shared belief was that EO is a well-established means for helping with climate adaptation and that EuroGEO has born several solutions to some of the related challenges (e.g. urban resilience to extreme weather, forestry conditions, hydropower in snow reservoir, seasonal preparedness). Most actions for promoting this are still through public investment into R&D, but the last mile is often left to businesses and national actions, which is a missed opportunity.

This is especially important, as noted by one of the participants, because this last mile is often one of the most important steps to take to ensure that end products can be shaped into a useful format for end-users. Another fruitful discussion related to this was on the importance of both in-situ and EO data, and above all the importance of combining multiple methods of data collection to ensure reliability and understanding of the collected data (e.g. combining hydrosphere, cryosphere and atmosphere).

New technologies, in particular Machine Learning (AI), can play a key role in ensuring this takes place. Utilization of these new technologies brings up both new opportunities and challenges, which could be further explored by the Action Group. However, they are additional means to already existing and more traditional methods of data collection and analysis.

Another challenge is that often, in-situ data is not openly available, even considering its importance for service development. Arguments were raised that in the Copernicus context this goes against what EU Member States have promised to do, and that it could be seen as Member States' contribution to the Copernicus program.

Another point of discussion concerned funding. There is a general sentiment of a lack of funding, without money, nothing can be done. For many participants, the upscaling of funding should be a priority. The challenge lies in bridging the gap from R&D to operation, with no/minimal costs for the users.

One of the possible solutions to this challenge was a proposal for a new EU funding system to reward service use without end-users having to pay. A possible example of how this could be used in practice was the proposal of a web tracking system, such as a centralized EU-controlled Matamo web tracking system, which could function as the basis for payments to create sustainable funding. The EU could then utilize C3S to set up and organize the system.

With this proposed solution, funding could come from private users without having to resort to fees for other users. The web trafficking services could be used in order to make people/organizations pay according to their use, also taking into consideration that funding can come from users that use very specific tailored products.

This idea was not uncontested by the other participants and important questions were raised. One of the criticisms of this solution was that it focusses too much on data providers and not enough on a solution tailored to the end-users. Another criticism was that there was no proper distinguishing between different services. Some services may use much wider data than others, so utilizing a one-size-fits-all solution can diminish some of the benefits of Copernicus.

Given that Copernicus deals with both big topics as well as niche subjects, such a solution could harm the overall effectiveness of the program by influencing how wide or niche end-users are willing to go without properly embracing both. Still, this was a fruitful discussion and this solution, or one similar, could be followed up upon in future meetings. There was also a brief discussion on getting funding from the European Investment Bank, which could be expanded upon in the future.

4.2.4 Specific recommendations to EuroGEO

- Investigate how to encourage further downstream adoption.
- Investigate how to further encourage local governments to be effective end-users of services.
- Further marketing of solutions to local governments.
- Encourage a better connection between EuroGEO and end-users
- Encourage further end-user stakeholder co-design and co-creation instead of focusing on traditional feedback loops.
- Investigate how to further involve local communities.
- Focus more on making the final connection between newly developed product/service and end-users, overcoming the last mile.
- Encourage further utilization of combining multiple datasets and in-situ data.

- Further encourage the gathering of in-situ data.
- Encourage in-situ data to be openly available and encourage Member States to see the sharing of in-situ data as a crucial part to their contribution to the Copernicus Program.
- Further discuss additional funding opportunities, such as through the European Investment Bank
- Further explore the possibility of a sustainable funding model, possibly through web tracking services.



4.3 Action Group Biodiversity, Ecosystems and Geodiversity

4.3.1 Session Chairs

- CNR and CIMA Research Foundation, Italy

4.3.2 Programme

- Opening Speech, Ivo Walsmit, Ministry of Foreign Affairs, The Netherlands
- The strategic challenges, Antonello Provenzale, CNR and CIMA Research Foundation, Italy
- Remote sensing and the whole-ecosystem approach, Edyta Wozniak, CBK PAN, Poland
- EO and management challenges, Ivette Serral, CREA, Spain
- Monitoring wetlands to address EU policy needs using Earth Observation, Christelle Vancutsem, JRC, EU
- Marine habitat suitability in a future climate, Anna Spinosa and Ghada El Serafy, Deltares, The Netherlands
- Vegetation trend indicators for monitoring biodiversity responses to global change, Spyros Theodoridis, NOA, Greece
- High resolution analytics and user uptake – a private sector view, Space4Good
- Virtual Research Environments and LifeWatch ERIC, Christos Arvanitidis, LifeWatch ERIC, Spain
- General discussion and ways forward

4.3.3 Session overview

This session brought together participants from policy, space agencies, research and private sector organizations. This EuroGEO day focused on the innovation pipeline and R&D issues for Earth observation, and discussed thematically in sessions organized by EuroGEO Action Group Biodiversity, ecosystems and geodiversity.

Antonello Provenzale (CNR) as lead of this Action Group provided an introduction to this session and summarized some challenges identified earlier.

The opening speech was provided by Ivo Walsmit (Netherlands Ministry of Foreign Affairs). He emphasized the importance of biodiversity in the (inter)national context of food security, water and climate and referred to new IPBES Nexus & Transformative Change reports and also Global Commission on the Economics of Water. He highlighted the relevance of Earth Observation to provide actionable insight and to measure what we achieve, e.g. for agroforestry, soil health, nature-based solutions.

This was followed by presentations from six researchers and one service provider. Edyta Wozniak (CBK) shares an overview of how Earth Observations contributes to monitor abiotic and biotic components. Ivette Serral (CREAF) summarizes main challenges and priorities related to EO skills, data, processing and platforms. Christelle Vancutsem (JRC) presented the systematic approach by JRC to analyze policy requirements and to define and report with (data) indicators. Examples included article 6.2. (degradation within Natura 2000 sites) and article 17 (6-year report on conservation status).

Anna Spinosa (Deltares) presented research results from amongst others adding Marine Habitat Suitability Modelling into the European Digital Twin of the Ocean (EDITO) with uses cases from North Sea (oyster restoration) and Baltic Sea (community-level fish assemblages). Spyros Theodoridis (NOA) presented research results using vegetation trend indicators for monitoring population-level biodiversity responses to global change and pleaded for a shift from pattern to process indicators for biodiversity policy. He pointed out that existing EO vegetation indicators do not contain information about ecosystems and stressed the need for incorporating field-based studies into EO products. Christos Arvanitidis (LifeWatch ERIC) presented their collaborative research to develop a federated infrastructure for eScience: Virtual Research Environments and supporting technologies. Finally, Arthur van der Meer (Space4Good) presented the role and added value of private sector for biodiversity and ecosystems in offering dedicated services for companies and governments. He emphasized the need for business cases for preserving biodiversity from the commercial market (e.g. compliance to EU regulations, such as EUDR, CSRD).

4.3.4 Discussions

One of the conclusions of the discussion is that there is a variation in how Earth Observation is supportive to biodiversity, ecosystems and geodiversity. A short, non-conclusive summary of identified usages:

- 1) Supportive to national and international policies. Monitoring and reporting. Are we on the right way, do we have an impact?
- 2) Supportive, as a data source, to research activities on biodiversity, ecosystems and geodiversity.
- 3) Planning and supporting (semi-)operational activities, e.g. forest management, agroforestry, nature-based solutions, risk analysis (e.g. for financial sector).

There is also a large variation in spatial and temporal information needs. Understanding ecosystems is very complex, requiring lots of data, from different sources and dimensions (spatial and temporal).

Policymakers often require reporting at a more abstract and condensed level. It is noted that the actors in EuroGEO are not yet well connected to the high-level policymakers (at national or intergovernmental level). It is often not yet clear how the uptake of project results into embedding organizations is organized. Also, the connection with the running GEO projects such as GEOBON and Global Ecosystems Atlas is weak and could be more developed. The current Action Plan does not provide a roadmap on how this communication can be improved.

It is agreed that private sector could contribute to biodiversity goals by delivering services, based on a business case, to commercial clients that have a positive effect on biodiversity, ecosystems and geodiversity.

4.3.5 Specific recommendations to EuroGEO

From the presentations and discussions several recommendations emerged.

- 1) There is a need of EuroGEO actors in this Action Group to be better aligned with (inter)national policymakers (including CBD, IPBES), other thematic Action Groups and some EO related Post-2025 GEO Work Programme activities such as GEOBON and Global Ecosystems Atlas.
- 2) Collaboration of the Biodiversity and other “thematic Action Groups” within the Green Deal Data Spaces Action Group could tackle cross-cutting related to data requirements, needs, problems, (eScience) infrastructure, semantics, etcetera.
- 3) The uptake of project results by possibly embedding organizations could deserve more attention (also, focusing on business cases and market demands).
- 4) The Action Groups could discuss these topics and come forward with a road map that could be part of the Action Plan.

Finally, Antonello Provenzale is ending his role as Action Group lead. He will be succeeded by Ivette Serral (CREAF).



4.4 Urban Action Group

4.4.1 Session Chairs

- Nektarios Chrysoulakis, FORTH
- Iphigenia Keramitsoglou, NOA
- Evangelos Gerasopoulos, NOA

4.4.2 Programme

- Welcome & Overview, *Nektarios Chrysoulakis, FORTH*
- Presentation of the key points of the draft strategy document, *Eleni Athanasopoulou, NOA*
- Tangible solutions supporting city workflows and reporting obligations, *Luciano Concezzi, TEAMDEV*
- EO Private Sector perspective, *Anica Huck, EUSI*
- General discussion, *Evangelos Gerasopoulos, NOA*
- Conclusions, *Iphigenia Keramitsoglou, NOA*

4.4.3 Session overview

4.4.3.1 Eleni Athanasopoulou (NOA)

- Presented the key points of the draft Copernicus strategy document, emphasizing stakeholder feedback and co-design.
- Called for an “innovation action” — encouraging proposals for new focus areas such as climate change mitigation, air pollution, and legal aspects related to environmental data use.
- Highlighted the importance of collaboration between the public and private sectors, especially in translating scientific data into actionable policy and communication with shareholders.

4.4.3.2 Luciano Concezzi (TEAMDEV)

- Showcased tangible, data-driven solutions that support cities in workflow automation and environmental reporting.
- Addressed the fragmentation and manual nature of current data acquisition, stressing the need for interoperability, faster data integration, and standardized reporting.
- Cited the Wisetown platform ([wise.town](https://www.wisetown.nl)) as an example of smart city integration, improving user experience for city managers and enabling citizen reporting of local issues, including those linked to climate impacts.

- Advocated for open data regulation and unified platforms to enhance response times and policy decisions.

1.1.1.2 Anica Huck (EUSI)

- Provided a private sector viewpoint on Earth Observation (EO).
- Emphasized the need for higher spatial and temporal resolution in satellite data to improve credibility and predictive capacity of digital twins.
- Highlighted challenges and opportunities in data acquisition frequency, geospatial fidelity, and training AI models for change detection.
- Stressed interoperability and the value of combining hyperspectral and multi-source satellite imaging for comprehensive environmental monitoring.

4.4.4 Discussions

4.4.4.1 Co-design and Strategy Development

The session emphasized collaborative input to refine the Copernicus Missions' strategy, focusing on climate change mitigation, air quality, legal frameworks, and stakeholder engagement. Participants were encouraged to contribute to upcoming innovation actions.

4.4.4.2 Public–Private Collaboration

Strong emphasis on combining efforts between public institutions and private industry to translate Earth Observation (EO) data into actionable policies and urban solutions.

4.4.4.3 Urban and Environmental Applications

Discussion covered integration of EO data for urban management — including heat stress on workforces, restoration of green spaces, reforestation monitoring, and resilience planning within digital twins.

4.4.4.4 Data Integration and Interoperability

Challenges identified in fragmented data systems; need for harmonized standards and interoperability across platforms. Calls for open data regulation under EU frameworks.

4.4.4.5 Advanced Sensing Technologies

High-resolution Lidar and hyperspectral imaging highlighted for detecting harmful materials (e.g., asbestos) and assessing vegetation health and restoration progress.

4.4.4.6 Renewable Energy and Urban Sustainability

Exploration of solar rooftop potential by combining EO data with GDPR-compliant energy meter data to identify energy surplus opportunities in cities.

4.4.4.7 Citizen Science and User Engagement

Recognition of the role of citizens and local authorities as key end users. Need for intuitive platforms (e.g., Wisetown, Space4Cities) enabling participation in environmental reporting and monitoring.



4.4.4.8 Private Sector Perspective

Industry representatives stressed the need for high spatial and temporal resolution data for digital twins, AI training, and predictive modeling — balanced with concerns about data storage and accessibility.

4.4.4.9 Urban Mobility and Data Fusion

Integration of EO with mobile and residential datasets to enhance understanding of urban mobility patterns and environmental impact.

4.4.4.10 Destination Earth and Future Directions

Reference to the Destination Earth initiative as a framework for next-generation EO integration. Focus on connecting urban innovation groups, establishing common urban data denominators, and protecting green areas.

4.4.4.11 Overarching Themes

Standardization, interoperability, open data access, and collaboration across sectors are essential to achieve climate resilience, sustainability, and effective urban management.

4.4.5 Specific recommendations to EuroGEO

4.4.5.1 Strengthen Urban Climate Resilience through Integrated Earth Observation

EuroGEO should prioritize the development of urban resilience applications combining Copernicus data, digital twins, and AI analytics to address the growing challenges of heat stress, air pollution, and loss of green spaces in European cities. Actions should include:

- Using Lidar and hyperspectral imaging to monitor reforestation, vegetation health, and detection of harmful materials such as asbestos.
- Integrating urban heat exposure, workforce well-being, and environmental data into predictive urban planning tools.
- Promoting co-design with municipalities and citizens to ensure local needs are reflected in Copernicus-based services

This will demonstrate how Earth Observation supports adaptive, data-driven climate action and improves the quality of life in urban areas.

4.4.5.2 Accelerate the Renewable Energy Transition through Open and Interoperable Data

EuroGEO should facilitate EO-based energy intelligence to support Europe's move toward renewable energy and urban sustainability. Key actions include:

- Mapping solar rooftop potential and energy surplus areas using Copernicus imagery combined with GDPR-compliant smart meter and mobility data.
- Promoting data interoperability and standardization to link EO information with energy, mobility, and environmental systems.

- Developing a unified platform that enables cities, energy providers, and citizens to access integrated EO services for planning and monitoring.

This will position EuroGEO as a catalyst for clean energy planning, data accessibility, and evidence-based climate mitigation.

4.4.5.3 Foster Public–Private Collaboration and Citizen Engagement for Next-Generation EO Platforms

To ensure sustainability and societal relevance, EuroGEO should advance a collaborative ecosystem connecting public authorities, private EO providers, and citizen science initiatives. Actions should include:

- Establishing public–private partnerships for co-developing EO-based solutions aligned with Destination Earth objectives.
- Supporting citizen-driven data collection and urban monitoring tools (e.g., Wisetown, Space4Cities) that integrate with Copernicus data services.
- Encouraging training of AI models and harmonization of EO datasets across public and private domains.

This collaboration will create a cohesive, user-oriented EuroGEO framework that maximizes innovation, interoperability, and engagement across Europe’s EO community.



4.5 Disaster Resilience and Health

The session brought together the members of the EuroGEO Action Group Disaster Resilience and Health to discuss the key R&I priorities for the downstream EO sector within the Action Group's domain, including discussion on the evolution of Copernicus Services. The Action Group's aim is to contribute directly to the EuroGEO Implementation Plan, based on preparatory work done in advance and the feedback of this session.

4.5.1 Session Chair

- Haris Kontoes, NOA/BEYOND, EuroGEO Action Group Disaster Resilience and Health coordinator

4.5.2 Programme

- Alexia Tsouni, NOA/BEYOND, EuroGEO Action Group Disaster Resilience pillar
- Mariza Kaskara, NOA/BEYOND, EuroGEO Action Group Health pillar
- Patrick Matgen, Luxembourg Institute of Science and Technology (LIST)
- Claudio Rossi, Links Foundation
- Maude Perier Camby, Vortex-io
- Mark Herringer, Open Healthsite Consulting

4.5.3 Session overview

After the welcome and the introduction of participants, session Chair Haris Kontoes presented the state-of-the-art resulting from the two Action Group Expert Studies commissioned by JRC/KCEO in 2025 and a number of recommendations that resulted from these studies and the follow up discussions. He also presented the European Strategic Research and Innovation Agenda (SRIA), the GEO Post-2025 Strategy and the different phases of how the Action Groups can support EuroGEO and vice versa. Apart from the general recommendations for the SRIA and EuroGEO that are similar for all Action Groups, Haris highlighted a number of specific recommendations for Disaster Resilience and Health. These are summarized in the last section.

The presentation was followed by questions to the panelists, moderated by the Chair. The recommendations presented by the Chair and those of the panel discussion are presented in the last section of these notes.

4.5.4 Discussions

The following challenges were identified for disaster resilience in the panel discussion:

- We have to go from small scale applications to a more integrated approach.
- The Copernicus programme is helpful, but better spatial and temporal resolution for flood early warning (and other applications) is needed and ARD data.



- Satellite information is not enough, in situ data (for validation) and hydrological models are also needed.
- Marketing for last-mile aspects is still a challenge.
- Funding for capacity building is needed.
- Involvement of the private sector needs to be increased.

The following challenges were identified for health in the panel discussion:

- Assessing how policies affect health outcome is needed and how to link EO directly with policies.
- Geographic planning of health provision (and the analysis to help achieve that) needs to be improved. Need for finer spatial and temporal resolution, analysis ready and cloud free products to minimize pre-processing.
- More attention needs to be given to cross-border (regional) early warning systems for health.

Below the proposed measures and suggestions that were discussed to address these challenges are summarized.

- For the daily updated (global) flood monitoring an exclusion layer is applied (built up urban areas, dense vegetation), but people do not like it, this should be explained better.
- EO should be embedded in early warning systems, improve GLOFAS.
- Global flood risk: moving from snapshots to risk assessment is important.
- Build trust and establish interoperability (not something only technical insiders understand).
- The warning is delivered, but we do not know what happens next, this should be addressed.
- Strengthen the co-design process.
- There should be business behind what is developed.
- Trust and validation of user stories are important (e.g. facilities mapping and harmonization in Senegal)
- Related to certainty / uncertainty in EO applications for health: the reduced accuracy should be clarified and downscaling validated.
- High(er) revisit time of relevant satellites would be useful, especially for flooding and forest fires.
- Partnership with the private sector: demos are needed on top of co-design. Tangible value needs to be demonstrated for better understanding.
- Risk assessment and damage assessment should be complemented by a prevention assessment.

- Several solutions were proposed to engage governments: work within the framework of general information management, create interest from stakeholders, provide technical knowledge and capacity building (brain-drain was mentioned as a problem).
- Working with start-ups, postdocs, students and blended finance were mentioned as a good way to help develop market-ready solutions.

A number of success stories were highlighted in key domains as follows:

- Enhancing EO Data Quality and Readiness and integrating in-situ data, modelling and AI towards real-time monitoring, early warning and risk prediction: The Copernicus EMS Global Flood Awareness System (GloFAS) & Global Flood Monitoring (GFM) keep evolving, also with the contribution of LIST during the e-shape project and afterwards.
- Integrating Earth Observation with Socio-Economic Intelligence: NOA/BYOND developed an advanced methodology moving forward from hazard assessment to risk assessment for floods and wildfires, which was applied in Greece and then transferred to Cyprus.
- Building Interoperable Systems transferable and scalable in Europe and beyond: Vortex-io collects in-situ data which are also exploited by EO companies.
- Co-design and early involvement to ensure that EO solutions address real operational demands and business use cases: Evenflow & EDGE co-designed a novel tool with and for the European Insurance and Occupational Pensions Authority (EIOPA), which provides flooding insights from Copernicus-powered solution for the Insurance Sector, helping European insurance supervisors assess flood risk and damage from potential natural disasters.
- Demonstrating market value: NOA/BYOND co-designs their health early warning system with TAKEDA Pharmaceuticals in Argentina, addressing the critical public health need for prevention and protection against the Mosquito-Borne Diseases.
- Addressing barriers hindering commercial uptake: Links Foundation provides services in support of the public Civil Protection authority.
- Ethical and inclusive innovation aligning with responsible data use, transparency, and capacity development: Open Healthsite Consulting provides services to Ministries of Health in Africa based on in-situ and open street map data.

4.5.5 Specific recommendations to EuroGEO

The question to the panel of “How can EuroGEO help in making the product/service visible?” yielded the following results:

- Provide an overview of how disaster management is organized in each country.
- Support the process of looking for business opportunities.
- Stimulate best practice sharing.
- Carry out a mapping of capabilities to reduce fragmentation of efforts.

- Push co-designing for impact.
- Give attention to enabling technologies, not only EO, but also e.g. AI, digital twins, 3D, virtual reality.
- Give attention to and stimulate embedding in policy.

These relate very much to the downstream priorities identified in Haris' presentation:

- Protect humans/animals/ecosystems by quantifying their exposure and vulnerability to climatic induced risks with focus on vector-borne diseases, water-borne diseases, as well as heat stress and air pollution especially for persons with severe respiratory and cardiovascular diseases;
- Scale early warning systems and disaster predictive models of high accuracy at fine resolution (city block, neighboring level);
- Deliver fine multi-risk assessments caused to anthropogenic disturbances and climatic seasonal anomalies in a multi-sector socio-economic environment;
- Proceed with innovative disaster driven urban planning that helps impact minimization and civil protection at city level;
- Protect the insurance sector with detailed hazard risk and damage assessments concerning insured assets, buildings and industrial infrastructure, manufacturing and agriculture sectors; Protect the tourism sector at mountains and sea through monitoring and forecasting the evolution of glacier ice, snow cover, avalanche, landslide, storm surge, tsunami, flood, wildfire, earthquake;
- Deliver trustworthy EO and AI/Gen AI systems for delivering textual predictions and policy recommendations to timely respond to disaster events;
- Improve EO-based detection, monitoring, response and management of disasters e.g. transport disasters, industrial accidents, human illegal practices causing toxic smoke dispersion, oil spill dispersion, soil and water contamination, dumping contaminated waste of chemical plants, petroleum refining industry pollution;
- Protect the urban natural and cultural heritage and protect from environmental crimes;
- Earth Intelligence to enhance resilience in urban environments aligning with WHO, the new EU Air Quality Directive, the Zero Pollution Action Plan, and guide progressive health protection measures, also exploiting synergies between existing European Research Infrastructure Consortia (ERICs) (i.e. ACTRIS, EIRENE).

And to the research and innovation priorities that were presented in the presentation:

- **ENTERING THE COPERNICUS EVOLUTION ERA:** Address identified shortcomings and operational limitations of Copernicus.
- **EuroGEO DATA SETS:** Generate, collect, harmonize and systematically clean, manage and preserve data to complement the existing Copernicus, DTs and EU Data Spaces.



- **COORDINATION AND SUPPORT ACTIONS:** Co-design / Co-create, Specify Earth Intelligence, Capacity Building, Training / Up-skilling / e-learning, Quality Standards, Adoption of International Standards in Service / Data curation, Support the EuroGEO Secretariat coordination role.
- **SECURITY ASPECTS:** Civil Security, Cyber Security of EO Systems and Infrastructure, Border Security, Data Security.
- **ENGAGE PRIVATE AND PUBLIC INVESTMENT:** Advance the role of the EO Private and Public sectors and investors, e.g. EIB, donors, etc., in the co-design, development and procurement of last mile commercial solutions. Support sustainability booster actions by showcasing success stories for Earth intelligence.
- **NATURE-BASED SOLUTIONS.**

All these aspects, with the exception of nature-based solutions, were discussed in the panel.

Last but not least, the need to invest in coordination, cooperation, capacity building and visibility of the wider EuroGEO community, including through the support of the EuroGEO Action Groups was emphasised, so that EuroGEO can contribute to GEO and vice-versa in a win-win situation. The relevant GEO thematic focus area is the “Weather, Hazard & Disasters Resilience”, where the EuroGEO Action Group contributes through the GEO flagship Global Wildfire Information System (GWIS), the GEO initiative GEO MOUNTAINS and the GEO enabling mechanism GEO Capacity Building in the Balkans, Black Sea, Middle East, Africa, and Pacific Asia Regions (GEO-CRADLE).



4.6 Action Group Energy

The Energy Action Group focuses on showcasing the utilization of Earth Observation (EO) data for renewable energies and climate applications. It directly aims at renewable energy applications based on Earth Observation data. It also tries to link the connections between renewable energies and climate. It also deals directly with EU related products such as the Copernicus Atmospheric Monitoring Service, the C3S and recently the Destination Earth initiatives.

In this session, we want to share the last progresses and emerging activities in the use of EO based services for Energy and to focus the discussions on that could be our contribution to the document called “EuroGEO Action Groups Recommendations for EuroGEO Implementation and EO SRIA evolution”.

4.6.1 Session Chairs

- Thierry RANCHIN (MINES Paris PSL) and Rizos-Theodoros Chadoulis (NOA)

4.6.2 Programme

- Copernicus Energy Hub, Lefteris Mamais, Evenflow on behalf of Stijn Vermoote, ECMWF
- Copernicus Climate Change Service, Vincent-Henri Peuch, ECMWF
- CAMS Solar radiation service – overview, Thierry Ranchin, MINES Paris PSL on behalf of Yves-Marie Saint Drenan, MINES Paris PSL and Marion Schroedter Homscheidt, DLR
- E-DREAM - Energy Droughts and Resource Energy Assessment in the Mediterranean, Rizos-Theodoros Chadoulis, National Observatory of Athens
- Satellite-Derived Insights for Smarter Offshore Renewable Strategies, Pooja Mahapatra, Fugro
- EuroGEO Action Group Strategy for the support of policy implementation, Thierry Ranchin, MINES Paris PSL

4.6.3 Session overview

4.6.3.1 Introduction

Thierry Ranchin opened the session by thanking the participants and noting that the presentation had been jointly prepared with Stelios Kazadzis, who was unable to attend. He explained that the purpose of the talk was to provide an overview of current developments and emerging activities in the field, drawing on the insights and contributions of all the presenters participating in the session.

4.6.3.2 Copernicus Energy Hub - Lefteris Mamais (Evenflow)

Speaking on behalf of ECMWF, which manages the contracts implementing the Copernicus Energy Hub, it was explained that the Copernicus Energy Hub serves as the primary entry point for anyone interested in exploring how Copernicus supports the energy domain. Rather than being a single service, it brings together all Copernicus activities relevant to energy stakeholders, offering access to datasets, success stories, training materials, and documentation. It also functions as a community of practice—an interactive platform where users can share their own activities to inspire peers, engage with data, and connect with

others. The Hub is part of a broader Copernicus user uptake effort linked with the Knowledge Centre for Earth Observation (KCEO) of DG DEFIS, EUSPA's downstream industrial initiatives, and Horizon Europe's R&I activities on energy. Within the Hub, users can, for instance, explore how C3S and CAMS datasets like ERA5 are applied in case studies—ranging from grid balancing to offshore wind and hydropower planning. Currently, 28 use cases are showcased, soon to reach 38.

In response to questions, it was noted that the Hub is beginning to feature case studies related to grid resilience, such as a recent event in Spain, with ongoing small-scale studies involving experts. Regarding short-term energy forecasting, minute-casting and now-casting capabilities are being used, and Meteosat data are among the resources considered for improving solar energy applications.

4.6.3.3 The C3S-ENTSO-E Pan-European Climate - Vincent-Henri Peuch (ECMWF)

On behalf of Nube González Reviriego (ECMWF), the presentation highlighted a key success story: the C3S-ENTSO-E Pan-European Climate Database (PECD), a collaboration between the Copernicus Climate Change Service (C3S) and the European Network of Transmission System Operators for Electricity (ENTSO-E). The initiative began even before the formal partnership, as ENTSO-E was already using climate reanalysis products to build early versions of the PECD, aiming to provide multi-decade climate data and extend it with future projections. The main objectives include ensuring open access, transparency, and traceability so that both policy and commercial users can understand how the data are derived. The dataset covers climate and energy variables across the ENTSO-E domain—the EU, coastal areas, islands, Ukraine, and parts of North Africa—at the ERA5 spatial resolution, with the upcoming ERA6 version (to feature 30 km resolution and more observations) expected to enhance spatial detail and quality. The latest version was released in June 2024.

During the discussion, several questions were raised. It was confirmed that the next version will indeed provide higher resolution, but that finer regional-scale assimilation is beyond the PECD's current scope, as homogeneity and consistency of results are prioritized. Finally, while the dataset primarily focuses on the supply side, ENTSO-E is also deeply interested in supply-demand balance, ensuring reliable energy transmission and understanding demand impacts across Europe.

4.6.3.4 The CAMS solar radiation service – overview - Thierry Ranchin (Mines Paris – PSL / ARMINES)

On behalf of Marion Schroedter-Homscheidt (DLR) and Yves-Marie Saint Drenan (MINES Paris – PSL / ARMINES), Thierry Ranchin presented an overview of the Copernicus Atmospheric Monitoring Service (CAMS) Solar Radiation Service, which provides consistent, quality-controlled solar irradiance data derived from satellite observations. Established within the broader Copernicus framework, the service has been operational since 2004, using information on clouds, aerosols, ozone, and water vapor to estimate the amount of solar energy reaching the Earth's surface.

The service is based on the Heliosat-4 method and integrates outputs from other CAMS components to generate global and direct irradiance products. The McClear model computes clear-sky radiation (i.e., without atmospheric effects), serving as a foundation for deriving Global Horizontal Irradiance (GHI) and diffuse components.

Now in its fourth version, the CAMS Radiation Service undergoes regular quality assessments, comparing results with data from Meteosat (MSG) and Himawari satellites, and will soon benefit from the Meteosat Third Generation (MTG) series, enhancing spatial and temporal resolution.

Thierry emphasized that solar radiation is a key driver of all energy systems, not only for solar power but also for atmospheric processes influencing wind and temperature, and thus has implications for both energy production and human health.



In the discussion, it was noted that the uncertainty in deriving Direct Normal Irradiance (DNI) from Global Horizontal Irradiance (GHI) depends on the complexity of the underlying algorithms but has been thoroughly evaluated and documented in official reports. The main users of the CAMS Solar Radiation Service are currently from the photovoltaic (PV) sector, although the service also supports concentrated solar power and other energy-related applications. Furthermore, CAMS data have been successfully applied in rooftop-level irradiance estimation, where users combine transposition models with high-resolution building datasets—such as LiDAR scans or Google-derived information—to achieve minute-scale temporal resolution and meter-level spatial detail, effectively capturing the impact of shading and building geometry in solar energy potential mapping.

4.6.3.5 Towards Resilience: Insights from DRE and E-DREAM – Rizos Theodoros Chadoulis (NOA)

Rizos-Theodoros Chadoulis from the National Observatory of Athens (NOA) presented an overview of two key European projects — Destination Renewable Energy (DRE) and E-DREAM — both addressing the challenges of climate resilience, renewable energy forecasting, and sustainable energy planning in Europe and the Mediterranean.

He began by setting the policy context, highlighting recent European and global energy and climate frameworks, such as the European Green Deal, Fit for 55, and the Paris Agreement, which set ambitious targets for clean energy generation and consumption. He emphasized the Mediterranean region as a climate hotspot, referencing findings from the IPCC Sixth Assessment Report, which project increasing heatwaves and extreme weather events. These trends underline the need for investment in energy transition and resilient infrastructure.

Rizos then introduced Destination Renewable Energy (DRE), a use case under the Destination Earth (DestinE) initiative. He explained that DRE aims to digitize the physical systems of solar and wind energy production through the development of a digital twin that integrates satellite observations, high-resolution simulations, and AI-based forecasting models. The service uses data from the DestinE Data Lake and leverages kilometric-scale global and regional simulations to produce highly localized assessments.

He described two core service levels, assessment and forecasting. These outputs are visualized as comparative analyses between observed and predicted values, currently validated in collaboration with Quest Energy and WeMET, two early pilot users in Greece. Future work will extend the forecasting horizon up to one or two years and further integrate the service with the DestinE ecosystem.

He continued with the E-DREAM project, which focuses on energy droughts and resource management across the Mediterranean and neighboring regions. The project leverages Copernicus Climate Data Store (CDS) datasets, climate projections, and resilience indicators to assess solar and wind resource variability and support climate-resilient investment decisions. Its goal is to enable cross-border cooperation and resilient energy system design under different climate scenarios.

Rizos described ongoing stakeholder engagement activities, including surveys conducted among research institutions, energy utilities, and private companies across the Mediterranean. Early results show that stakeholders prioritize operational needs and real-time data access, while research-oriented aspects, though valuable, are secondary to applied solutions for managing extreme events such as droughts and energy shortages.

He concluded by drawing a symbolic parallel to Monet's "Impression, Sunrise," describing it as a metaphor for a "new dawn of climate resilience." In closing, he reiterated that both DRE and E-DREAM aim to translate scientific knowledge into practical, actionable insights that advance Europe's transition toward a sustainable and resilient energy future.

During the Q&A, a participant asked about the spatial resolution of the forecasts. Rizos clarified that users can obtain results for any geographic point by specifying latitude and longitude.

4.6.3.6 Satellite-derived insights for smarter offshore renewable strategies - Pooja Mahapatra (FUGRO)

The presentation titled “Satellite-Derived Insights for Smarter Offshore Renewable Strategies,” delivered by Pooja Mahapatra from EOMAP, a Fugro company, focused on the role of satellite Earth Observation (EO) in accelerating offshore renewable energy deployment in alignment with Europe’s climate goals, particularly those outlined in the European Green Deal and RePowerEU. It was noted that traditional offshore surveys, including MetOcean and geophysical measurements, are often costly and time-consuming, creating delays in the expansion of renewable energy infrastructure. EO technologies were presented as an effective alternative, capable of delivering rapid, regional, and historical environmental insights crucial for informed planning and sustainable operations.

The speaker outlined EOMAP and Fugro’s integrated end-to-end approach, which combines local in situ measurements, environmental modelling, and EO-based mapping with user-oriented decision support tools. These integrated solutions aim to improve risk assessment, streamline planning, and optimize management throughout the entire offshore energy project lifecycle—from initial site selection and construction to operational monitoring and eventual decommissioning.

Key initiatives were discussed, including OASIS (Optimizing Offshore Energy Site Selection) and the EU- and ESA-funded projects Blue-X and DIOMEDEO. These initiatives make extensive use of Copernicus satellite data to advance the development of blue energy solutions. They were highlighted as efforts to overcome current limitations in EO applications for the energy sector by extending their use beyond specific technologies and providing comprehensive lifecycle support for offshore renewable projects.

The presentation also introduced EOMAP’s web-based Decision Support Tool (DST), which integrates high-quality EO data with advanced analytics and visualization capabilities. The DST supports users in performing suitability assessments, monitoring environmental parameters, and conducting spatial analyses such as heatmap-based planning. Its goal is to reduce project costs and risks while ensuring compliance with environmental and regulatory frameworks.

In conclusion, the presentation emphasized that EO-based data and tools play a transformative role in supporting evidence-based decision-making across the blue economy, ultimately contributing to a more efficient, sustainable, and resilient future for offshore renewable energy in Europe.

4.6.4 Discussions

The follow-up discussion after the presentations focused on identifying and addressing key needs for enhancing the integration of Earth Observation (EO) into renewable energy planning and operations. Among the highlighted priorities were: improving EO integration into energy systems, promoting sector-specific applications and market uptake, fostering international and cross-border collaboration, strengthening capacity building and awareness, and better incorporating climate change considerations into renewable energy output assessments.

An additional point was added to the priorities: the connection and support to the policies relevant for the energy sector.

Participants explored strategic directions to respond to these community needs and reflected on ongoing policy and funding frameworks. It was noted that the European Commission is preparing its next Multiannual Financial Framework (2028–2034), which will include the new European Competitiveness Fund (ECF) — a consolidation of around fourteen existing legislative frameworks covering areas such as

research, innovation, security, and space, with significant allocations expected for Copernicus and related services. The discussion underlined the importance of maintaining continuity of operational EO services while enhancing their capabilities within future Commission priorities.

Speakers emphasized the value of EO for renewable energy site selection and planning, calling for stronger links between EO-based tools and relevant policies such as the Renewable Energy Directive. Questions were raised about the future evolution of the Copernicus Hubs, noting their current role as user engagement instruments rather than full-fledged data production tools.

From the private sector perspective, contributors stressed two key aspects: (i) data sharing, especially in challenging environments like offshore wind where data acquisition is costly; and (ii) scalability, particularly the need to bridge the gap, the last-mile, between research (TRL 4–5) and market-ready applications. The private sector was seen as a crucial enabler in developing sustainable business models that transform scientific outcomes into operational services.

Overall, the session reaffirmed the shared vision of strengthening the EO–energy nexus through improved policy alignment, funding continuity, user engagement, and public–private collaboration in the next European framework period.



4.7 Action Group Green Deal Data Space

The Green Deal Data Space Action Group (GDDS-AG) is a collaborative forum within EuroGEO focused on developing the Green Deal Data Space (GDDS). The Action Group brings together researchers, technical experts, and policymakers from major EU-funded projects—most notably AD4GD, FAIRiCUBE, USAGE, B-Cubed and Great—to advance data harmonization, semantic interoperability, metadata standards, and governance approaches in support of the European Green Deal goals. Most of these projects soon end their activities, or have already been finalized, leaving SAGE as almost the only active project dedicated to the Green Deal Data Space.

The organization of the GDDS-AG in project members made sense but we would like to transition to an individual or organizational membership. We also would like to turn our focus to how the future GDDS that SAGE is starting to build can contribute to the benefit of the data collected with thematic action groups dealing with climate, pollution, biodiversity and the rest of topics relevant for the European Green Deal.

We will want to focus the discussions on what could be our contribution to the document called “EuroGEO Action Groups Recommendations for EuroGEO Implementation and EO SRIA evolution”.

4.7.1 Session Chair

- Joan Maso Pau, Research Centre on Ecological and Forestry Applications (CREAF)

4.7.2 Programme

- Introduction to the GDDS Action Group, Alba Brobia, Research Centre on Ecological and Forestry Applications (CREAF)
- Data Space concept and the GREAT project roadmap, Mattia Santoro, National Research Council of Italy (CNR)
- Progress on AD4GD and semantics, Raul Palma, Poznan Supercomputing and Networking Center (PSNC)
- SAGE project approach to the GDDS, Mark Dietrich, Bloodstone Consulting
- more4nature and CitiObs contribution to the GDDS, Joan Maso Pau, CREAF
- Biodiversity, ecosystems and geodiversity needs, Spyros Theodoridis, National Observatory of Athens (NOA)
- Needs and socio-economic and societal benefits of weather and climate services, Kaisa Juhanko, Finnish Meteorological Institute (FMI)



4.7.3 Session overview

4.7.3.1 Joan Maso Pau, CREAM, Introduction of the session

The Green Data Space Action Group was formed by different projects that had the mandate to develop solutions around the Green Deal Data Space. Four of these projects — AD4GD, B-Cubed, FAIRiCUBE, and USAGE — came together to create a joint policy brief (<https://tinyurl.com/2s4ftxv6>).

These four projects formed the core of the Action Group, but there were also extensions — other related projects working on similar topics that were invited to participate. Changes are currently occurring, and the on-going work is to understand how this group can interact and support more thematic EuroGEO Action Groups and contribute effectively to the overall EuroGEO.

4.7.3.2 Alba Brobia Ansoleaga, CREAM

4.7.3.2.1 Topic: Introduction to the GDDS Action Group

The Green Deal Data Space Action Group (GDDS-AG) acts as one of the nine official EuroGEO Action Groups, under the European GEO framework. The GDDS-AG's main objective is to coordinate ongoing research and technological developments that contribute to the construction of the Green Deal Data Space (GDDS) — a shared data infrastructure supporting the European Green Deal. The GDDS-AG's mission is to select, test, and validate technologies, data standards, and implementations that ensure compatibility with the broader Group on Earth Observations (GEO) ecosystem. The GDDS-AG was established during the EuroGEO Workshop in 2022, held in Athens, Greece, and has since been led by Joan Maso Pau from CREAM. From its inception, it has brought together several EU-funded research and innovation projects and entrusted entities working on topics relevant to the Green Deal Data Space, as well as other activities within EuroGEO and the GEO global community. Two major policy frameworks guide the group's work 1/The European Green Deal, which sets the overarching environmental and sustainability goals for the EU by 2050, and 2/The European Strategy for Data, which provides the digital and data governance framework for the continent. In practice, the projects that form this group organize data and conduct scientific research through their respective project activities including the development of multi-thematic and multidimensional data cubes, the integration of data through OGC APIs, and the semantic standardization of concepts and variables. The action group also focuses on improving data quality and interoperability and operates as a Community of Practice. Numerous resources have been produced by the GDDS-AG and are available here: (<https://actiongroup.greendealdata.space/>). The state of play and the future of this group include the participation in the European Commission's Data Space Cluster Event in Brussels, held in May 2025 highlighting the ongoing necessity to coordinate efforts among all the projects involved in the GDDS development. A new EU-funded project called SAGE (Sustainable Green Europe Data Space) will lead future progress toward the implementation of the Green Deal Data Space and will play a central role in moving forward the Action Group. The GDDS-AG could support other EuroGEO thematic action groups in terms of data standardization and interoperability and also in terms of infrastructure, technology or restricted data policies and implementation which are key aspects of data spaces.

4.7.3.3 Mattia Santoro, CNR

4.7.3.3.1 Topic: Data Space concept and the GREAT project roadmap

The presentation illustrates the work carried out for developing the Green Deal Data Space (GDDS) and focuses on the contribution of the GREAT project towards its future evolution. In support of the European Strategy for Data the GDDS strategy aims to create and facilitate a data-driven economy establishing a common European market for data that can support new economic models and innovation. This strategy was built on several pillars, including legislative frameworks, enablers, and infrastructures established by the European Commission. The GDDS stands out as a particularly ambitious and cross-cutting initiative

encompassing and interconnecting multiple domains. The goal is to interconnect fragmented and dispersed data systems across Europe, offering an interoperable and trusted digital environment while respecting core European values, especially the right of data owners to decide who and how potential users can access their data and under what conditions. The GREAT project brought together multiple partners to define the requirements including high-priority datasets, technical blueprint, and governance and business models for the future data space that finally converged into the release of a comprehensive roadmap. The central element of this roadmap is the high-level architecture or technical blueprint which highlights how the GDDS is structured as a dynamic and adaptable digital ecosystem to support Earth Intelligence and sustainable data sharing. This digital ecosystem addresses autonomous systems or organizations under which each participant contributes unique functions and resources. No fixed membership or rigid structure are pre-established, and governance is essential for ensuring trust, security, and sustainability. The GDDS is not a new infrastructure, but rather an integration layer built on top of existing and future data systems aiming at unifying these heterogeneous systems under common principles and standards and creating a federated and adaptive architecture rather than replacing existing infrastructures. The GDDS ecosystem identifies three main actors, the data providers, the intermediate users and the end users with under core principles including, fairness, autonomy and inclusiveness. The structural components and governance model of the GDDS digital ecosystem identify two main components, the core components providing essential functions (e.g., authentication, identity management, metadata services) and the facilitator components enhancing usability and interoperability providing benefits for each of the three above-mentioned stakeholders groups. Results of the GREAT project have been used to develop the proposal for the SAGE project which is now tasked with implementing the Green Deal Data Space in practice. SAGE will focus on transitioning from this high-level vision to an operational architecture, and on providing guidance and recommendations to ensure that the Green Deal Data Space evolves into a sustainable, inclusive, and effective digital ecosystem for Europe's environmental data.

4.7.3.4 Raul Palma, Poznan Supercomputing and Networking Center

4.7.3.4.1 Topic: Progress on AD4GD and semantics

The main focus of the AD4GD project is related to semantic interoperability. It adopts an incremental approach toward achieving full semantic interaction, following a “pay-as-you-go” data management principle. This approach, inspired by Tim Berners-Lee's Linked Data 5-stars framework involves a common data model, domain vocabularies developed within AD4GD, a vocabulary service implemented using the OGC Rainbow framework, a series of interoperability mechanisms called data harmonization pipelines and integrated data access interfaces built on OGC standards. Green Deal Information Model provides the foundation for the Green Deal Data Space, enabling interoperability across different systems and allowing integrated analysis of their data. AD4GD has created specific controlled vocabularies for Essential Variables, including those for biodiversity, , and water quality and air quality standard names. All these vocabularies are available in OGC Rainbow which hosts a catalog of semantic resources accessible in multiple formats. Data harmonization task for preparing, processing, and semantically enriching datasets is implemented in a framework called the Data Preparation Integration Pipeline (DPIP). This is a software toolkit based on linked data and knowledge graph technologies, designed to handle diverse data sources and formats. AD4GD has standardized data access via APIs to facilitate FAIR (Findable, Accessible, Interoperable, Reusable) by implementing the OGC SensorThings API (STA) Service, which automatically exposes harmonized data through standard OGC STA endpoints. AD4GD prepared a booklet which includes sections on semantic interoperability, as well as other project components and pilot use cases (<https://tinyurl.com/yc64mpsp>).

4.7.3.5 Mark Dietrich, Bloodstone Consulting

4.7.3.5.1 Topic: SAGE project approach to the GDDS

A data space aims to enable sharing of data, software, services, and knowledge across defined groups of users, while ensuring data sovereignty, fairness, inclusiveness and autonomy. The Open Data Institute's (ODI) Data Sharing Spectrum, published in 2020 ranges from closed data to fully open data. While we're used to work with open data in the Copernicus and Earth Observation communities, there's a great deal of non-open or restricted data that we still want — and need — to use. The SAGE project develops ten use cases, many of which involve a combination of open and restricted data. The goal is to make it possible to combine restricted and public data responsibly and securely. To support this SAGE is building new access models between the “closed” and “open” ends of the spectrum. Data spaces do not store or process data directly — that's what cloud infrastructures are for. A data space defines the rules, interfaces, and trust mechanisms that make secure data sharing possible. SAGE Data Space, architecture includes several functional layers, 1) The Control Plane, responsible for data sovereignty and enforcement of governance rules 2) The Governance Plane, where policies are defined with The Functional Core Components, such as the Policy Decision Point, Policy Information Point, and Policy Execution Point. 3) The Data plane, where the data assets are made available. The participants include research infrastructures, large companies, SMEs, or public administrations. For example, the data space could be used to report data to the European Commission or a national authority, fulfilling legal obligations while maintaining control and traceability. SAGE will evolve from a project consortium into a legal entity and is currently exploring governance options to finalize decisions by the end of the project in about two and a half years. In the data space participants operate their own systems and connect to the data space through “data space connectors”. One key challenge related to inclusiveness, is that not every participant, like small organizations or SME's has the resources to host their own connector. There is a need for a “Connector-as-a-Service” solution. SAGE project links with many participants providing open data from many sources including Research infrastructures (ESFRI), data.europa.eu, INSPIRE data from the high-value datasets from EU Member States, Copernicus, DestinE (Destination Earth), Blue-Cloud, EDITO Data Lakes and future AI factories under the EU's Data Strategy. The SAGE Data Space establishes a governed, trusted environment that enables participants to exchange and reuse data — both open and restricted — while respecting data sovereignty, semantic interoperability, and European values of fairness, inclusiveness, and autonomy.

4.7.3.6 Joan Maso Pau, CREAM

4.7.3.6.1 Topic: more4nature and CitiObs contribution to the GDDS

Citizen science activity is now part of the in-situ sub-group of the GEO Data and Knowledge Working Group in the new GEO work program. Two on-going EC funded project CitiObs and more4nature are providing support to EuroGEO in the field of citizen science. CitiObs provides toolkits and instruments that empower citizen scientists to monitor and act on environmental challenges through inclusive innovation tools and robust data practices. Four toolkits have been developed. The OGC SensorThings API is used to integrate data from multiple air-quality sources into a virtual service that constitutes the analysis ready data layer that enable to produce air quality maps that are decision-ready information. In more4nature, project citizen science activities illustrate the case of environmental compliance assurance with near real-time alerting system addressing industrial pollution (where citizens gather evidence against large companies responsible for environmental damage) and the elaboration of indicators to monitor policy against targets. It's crucial in such cases, to protect and restrict access to sensitive data until sufficient evidence is gathered or legal implications are clarified. Once ready, the data can be released publicly — but responsibly — given the potential consequences for those involved. In a use case in Cambodia rangers, volunteers, and Indigenous communities are reporting cases of illegal deforestation. It is crucial to protect and anonymize citizen-collected data, ensuring that it cannot endanger the people gathering it. Those two projects illustrate more complex cases compared to fully open data initiatives where data sensitivity, privacy, and

safety come into play. We need to think carefully about how citizen science integrates with data spaces, and how we can ensure both openness and protection when necessary.

4.7.3.7 Spyros Theodoridis, NOA

4.7.3.7.1 Topic: Biodiversity, ecosystems and geodiversity needs

The EuroGEO Action Group on Biodiversity is supporting the European Green Deal targets aligning with the European biodiversity strategy for 2030 notably in support of industrial activities including medicine, agriculture and food and drink. The Green Deal recognizes financial and economic value to biodiversity. A rough estimation of a loss around 20 trillion euros per year since the 1990s because of biodiversity loss is to be considered. Green Deal includes specific requirements for both small and large companies that will soon be required to disclose their biodiversity impacts. Those impacts are supported by data and to a large extent by EO data and indicators which is where the EuroGEO Biodiversity Action Group provides expertise. Nevertheless, there are still gaps existing regarding some specific data addressing Essential Biodiversity Variables such as species composition, invasive alien species, population size, genetic resources that offer market opportunity for technical innovation to SME's. An example is the medicinal plant domain supported by ecology and biodiversity which is linked to the financial and social aspects of human life. All the bioactive compounds sourced from nature are the result of ecological processes — pollination, adaptation to climate, and biotic interactions. Bioactive compounds are then used by human societies, either in traditional ways or in evidence-based medicine providing great value to society and to the market. The European market for medicinal and aromatic plants in 2023 was estimated at 40 to 50 billion euros, including pharmaceuticals, food supplements, and the health industry. A publication proposes specific spatial indicators that can be used for this market (The Lancet Theodoridis et al. 2023). In general biodiversity is under threat from seasonal and climate-related changes. Many protected species are being affected both seasonally and in the long term. The Green Data Space could provide support for integrating field-based biodiversity data with climate data to provide policymakers with actionable insights without revealing the exact locations of sensitive species or habitats.

4.7.3.8 Kaisa Juhanko, Finnish Meteorological Institute (FMI)

4.7.3.8.1 Topic: Needs and socio-economic and societal benefits of weather and climate services

The EuroGEO Climate Action Group mainly focuses on the last mile of the services being created and how to reach users and generate value showcasing how climate data and information can create socioeconomic benefits. Socioeconomic benefits are supported by three main pillars that form the base for creating societal welfare: 1) The economic dimension covering revenues, livelihoods, and efficiency 2) The environmental dimension including biodiversity, ecosystems, climate change, resource consumption, and land use 3) The social dimension concerning justice and fairness, culture and education, health, and vulnerability. Intersecting these three dimensions one finds themes such as sustainable economy, equitable investment, adaptation, and resilience and in the center “happy globe with happy people” e.g. societal welfare. Climate data enables early warnings, saving lives and protecting infrastructure. Such data enables long-term planning, helps governments and businesses to reduce risks related to extreme events and climate change and provides evidence for effective, informed policy and decision-making. Accounting for social impact is increasingly seen as one of the key R&I (Research and Innovation) priorities for the future with the need to demonstrate tangible societal benefits. While most of these impacts are intangible, beyond market value, and often undervalued, the economic evaluation of societal impacts can support informed decision-making by comparing different options and outcomes in economic terms. The value-chain analysis for weather and climate information services help to showcase the steps of how raw data is transformed into services, and then into actual outcomes and user responses echoing the motto “Turning Data into Action.” In the forest sector climate change is increasing the pressure on forest resilience, exposing them to multiple climate hazards throughout their lifespan — such as wildfires, insect outbreaks,

windthrow, and unsustainable management. Data showcases a clear rise in losses (30% of losses since 1980s) in the forest industry, along with increasing prices for insurance and a tightening market. Turning data into impacts such as crop losses, wildfire occurrences or hospital admissions links hazards with real losses and impacts helping to design climate-aware insurance products that more accurately reflect evolving risks. Open tools and transparent information can also empower citizens and small businesses to increase their own adaptive capacity. Climate data is vital for achieving sustainable social and economic development, but its full potential is limited by restricted access to impact data and a lack of interoperability. To improve climate risk assessment and adaptation, policies must encourage data sharing, standardization, and collaboration across sectors. When impact and economic data are shared and harmonized, climate information can be transformed into actionable insights that drive effective adaptation in both public and private domains.

4.7.4 Discussions

4.7.4.1 Evangelos Gerasopoulos, NOA

4.7.4.1.1 Topic: Session wrap-up assessing how could the Green Deal Data Space benefit to EuroGEO Action Groups in general with a focus on the EuroGEO Urban Action Group.

The Urban Action Group session recognized the strong need for action groups to coordinate, especially the cross-cutting ones including the GDDS emphasizing the Urban Action Group is also cross-cutting because it deals with climate, energy, disasters, and related topics. Data is at the heart of urban workflows and comes in various types and restrictions policies addressed by the GDDS. This includes high resolution from satellite airborne or drone data and of course in-situ from regulatory networks or research activities. The Internet of Things and citizen science are also important components to consider. IoT faces the challenges of quality assurance and quality control to support decision-making in addition to reluctance to share data, mostly the ones coming from the private sector. For citizen science an important aspect is inclusivity. Even if there are many citizens in cities with a good potential of becoming volunteers, citizen science in rural areas is difficult. Finally in cities, urban studies need microdata coming from statistical authorities but most of the time, the data is too aggregated due to privacy constraints like GDPR. Same issues apply for socioeconomic data which is a key element in the GEO Earth Intelligence 2025 strategy. Embracing all Action Groups and related to GDDS, interoperability among data spaces is crucial.

4.7.5 Specific recommendations to EuroGEO

- Consider data spaces as a new way to contribute to GEO from the European context enabling SMEs to provide services and data that can be restricted to authorized users.
- Support the inclusion of citizen science data as a potential data source that can cover gaps in in-situ observations.
- Continue working in the Essential Variable framework as a way to organize the in-situ observations contributed to GEO.
- Consider that the Green Deal Data Space is a transversal Action group that can support thematic actions groups in the issue of exchanging restricted data.



4.8 Action Group Land Intelligence for monitoring and enforcement of policy

4.8.1 Chairs

- Stanislaw Lewiński, CBK & Conrad Bielski, Riscognition

4.8.2 Programme

- Barriers & Opportunities for EO for law enforcement. Coco Antonissen, Netherlands Space Office (NSO)
- Sonja Ham, Netherlands National Police
- Case Study TerraVisie Space Surveillance: Automatic monitoring of soil displacement. Koen Meilink and Edo Loenen, Science & Technology Corporation (S[&]T)
- Environmental Crime – Examples of EO Applications. Stan Lewiński, Space Research Centre, Polish Academy of Sciences
- Land Intelligence for War-Induced Damage Assessment and Compliance Monitoring in Ukraine. Nataliia Kussul, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" and University of Maryland
- Collecting In-Situ training and validation data with experts and citizens for land cover, land use and environmental crimes. Steffen Fritz, International Institute for Applied Systems Analysis (IIASA)

4.8.3 Session summary

During the session led by the Action Group Land Cover and Land Intelligence (LC&LI) at the EuroGEO2025 workshop, four presentations were delivered:

- Practical experiences from monitoring land displacement during hydrological works in the Netherlands;
- Examples of destruction and devastation caused by the ongoing war in Ukraine;
- Technical, technological, and administrative challenges related to monitoring changes on the Earth's surface resulting from illegal activities;
- The importance of citizen science in collecting in situ data is essential for Earth Observation (EO) analyses.

All presentations were directly related to monitoring activities classified as environmental crime.

Environmental crime has been highlighted by AG LC&LI for several years as a topic of growing importance. Monitoring environmental crimes falls within the scope of land cover and land use monitoring, but requires a completely different approach compared to traditional EO data analysis methods. Environmental crimes include illegal logging, unauthorised construction, mineral extraction, disposal of toxic materials, illegal landfills, grassland burning, and water and air pollution. A particularly complex issue is the reclamation of

post-mining areas, during which waste is often buried. Agricultural production waste also poses environmental risks and is subject to regulation. The list of environmental crimes is long. It is crucial not only to identify the location of such practices but also to perform quantitative and qualitative measurements.

Identifying sites of environmental crime is challenging. These are often small-scale objects with high temporal variability. Moreover, criminal activities are typically hidden. Traditional methods of satellite and aerial image analysis can only be applied in limited cases. There is a pressing need to develop new solutions, including classification techniques and data integration from various sources. GIS analyses using administrative data are helpful. Developing dedicated DL/AI models is justified, although access to validated training data remains a significant limitation. Close cooperation with local authorities and environmental agencies is essential.

Due to the rapid pace of changes associated with environmental crimes, a promising direction involves observations from airships capable of hovering for several days at altitudes of 10–20 km. These are not new technologies, but they are not yet used operationally and require further development.

Activities targeting environmental crime are closely linked to “green” environmental policies—but not exclusively. There is synergy with security. Methods developed for crime identification can be adapted for locating threats or assessing damage. One example is the identification of illegal sand and gravel extraction sites. Sand and gravel are used in large quantities in construction, and due to transport costs, illegal extraction is a problem in every European country. At the same time, there is a significant resemblance to sites where earthen fortifications (trenches) are built or areas damaged by warfare (bomb craters). Examples of war-related destruction were presented by colleagues from Ukraine. The possibility of long-term and continuous observations is also directly related to security.

Summary: Environmental crimes are a significant and simultaneously challenging topic. They require the development of new methods for acquiring and analysing satellite and aerial imagery. This should be pursued through long-term research and application projects carried out jointly by EO specialists focused on environmental analysis, public administration, and DL/AI experts. Citizen science has an important role to play.

4.8.4 Session overview

4.8.4.1 Coco Antonissen, Netherlands Space Office Programme Manager Space Applications & User Uptake

Focus: Use case on how LC & LI AG can support innovation.

4.8.4.1.1 Case Study: Collaboration with the Netherlands Forensic Department following an innovation call (2028).

Challenge: Transitioning from pilot to market proved difficult.

- The European Commission and the Netherlands both published staff working documents identifying potential follow-up actions.
- Barriers identified across themes: accessibility, usability, and adoption.

Key Takeaways

- Deep understanding of user needs through co-design is essential.

- Consider non-technical barriers (e.g. more data ≠ more uptake).
- Law enforcement data often faces access challenges, though not universally.

4.8.4.2 Koen Meilink and Edo Loenen, S[&]T

S&T (Delft) – Space company specialising in earth intelligence (actionable insights from satellite data).
Dutch Police – Aim to stay relevant in the innovation revolution, making law enforcement faster, smarter, safer.

Challenge: Privacy regulations and limited technical expertise require strong collaboration.

4.8.4.2.1 Use Case: *Environmental Crime*

Nature of the problem:

- Hard to detect, trace, or attribute due to cross-border complexity and falsified documentation.
- Fragmented supervision in the Netherlands; often detected too late (e.g. soil pollution cases).

Solution: Development of TERRAVISIE – a risk-based, data-driven tool using Copernicus and optical imagery.

- Enables time-based overviews and supports proactive inspections.
- Integrates with other datasets for verification and context.

Approach:

- 2-step, user-friendly interface enabling visual tracking of progress over time.
- Co-developed with users since 2018, now operational (2025) in two pilot cases.

Lessons Learned:

- The gap between “it works” and “it works sustainably” is significant.
- System integration (security, user management) posed early hurdles.

User engagement and communication are key – “Don’t assume user needs.”

Fit-for-purpose design: start small, iterate, and expand.

- Inclusion of all user types throughout development is crucial yet culturally challenging.

Budgeting constraints, particularly in less “attractive” areas such as environmental crime, remain a barrier.

Outlook:

- Operational system running; expansion planned for next year.
- Ongoing engagement across the full value chain – developers and end users collaborating closely.

4.8.4.3 Stan Lewiński, Space Research Centre, Polish Academy of Sciences

Theme: Remote sensing in detecting environmental crime.

Institutional Setting: Polish environmental protection managed by GDÓŚ, GIOŚ, and local authorities.

Applications:

- Illegal waste disposal, mineral extraction, and landfill monitoring.
- Combining administrative data, GIS, satellite imagery, aerial data, and citizen science.

Key Points:

- Local governments benefit from data-driven insights (e.g. optimal sand extraction sites).
- Growing deterrent effect as criminals become aware of satellite monitoring.
- Machine learning and deep learning need substantial data – often incomplete.
- Emphasis on data re-use and integration of existing datasets.

4.8.4.4 Nataliia Kussul, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" and University of Maryland

Focus: War-induced environmental and agricultural crimes.

Applications of Satellite Data:

- Estimating unharvested crops due to conflict.
- Mapping mined agricultural fields to prioritise demining.

Cost efficiency: non-technical survey via satellites up to five times cheaper than ground methods.

- Identifying forest damage caused by war (using optical, radar, and lidar data).
- Conclusion: Space data is indispensable for crime assessment and recovery planning in conflict zones.

4.8.4.5 Steffen Fritz, IIASA - International Institute for Applied Systems Analysis

Topic: Importance of in situ data for land use and land cover (LULC).

- Algorithmic sophistication is secondary to the quality of training data.
- Introduction to GEO-Wiki: crowdsourced, user-friendly data validation campaigns.
- Development of a Global Field Size product and ML-ready segmentation tools.
- Collaboration with DeepMind for data validation.

4.8.5 Specific recommendations to EuroGEO

Embed co-design methodologies and structured user engagement processes across all EuroGEO actions.

Rationale: The NSO and TERRAVISIE cases showed that poor understanding of user needs impedes adoption even when technology performs well.

- Develop EuroGEO-wide user requirement frameworks to guide service development.



- Facilitate regular co-creation sessions with end users (law enforcement, environmental agencies, inspectors).

EuroGEO should systematically consider legal, institutional and cultural barriers alongside technological innovation e.g. Data privacy, fragmented governance, and procurement hurdles in law enforcement.

- Establish a cross-thematic task force on non-technical barriers to EO service uptake.
- Produce guidelines for operationalisation beyond pilots, focusing on data governance and integration with public authority systems.

Support the “**pilot-to-operations**” phase, identified as a recurring bottleneck (Netherlands and TERRAVISIE examples).

- Create a EuroGEO Innovation Bridge to assist successful pilots in scaling to operational level (mentoring, funding continuity, business support).
- Facilitate peer exchange between projects that have achieved operational maturity.

Recognise **environmental crime** as a strategic EuroGEO theme due to its strong EO relevance and societal impact.

- Engage national law enforcement bodies and inspectorates as formal partners.
- Integrate Copernicus, in situ, and administrative datasets to support early detection and investigation.

Ensure interoperable, multi-source data ecosystems for environmental monitoring.

- Promote the **reuse of existing data** and alignment of Copernicus, GEO-Wiki, and national datasets.
- Encourage open data standards and documentation for ML/DL training datasets.
- Support integration of optical and radar imagery, and citizen science inputs.

Invest in capacity-building and literacy for public authorities, particularly law enforcement and environmental inspectors.

- Develop a EuroGEO Academy module on EO applications for environmental compliance and crime prevention.
- Promote training-of-trainers models in collaboration with national agencies.

Prioritise the integration of in situ data for validation of EO-based monitoring, as emphasised by IIASA.

- Leverage existing platforms (e.g. GEO-Wiki) to validate EuroGEO datasets.
- Encourage participatory data collection (citizen science) to strengthen ground truthing.
- Develop standards for field data suitable for ML training and policy reporting.

Recognise **war-induced and conflict-related environmental degradation** as a new EuroGEO thematic area.

- Support satellite-based methods for assessing war-related agricultural losses, contamination, and forest damage (as in Ukraine’s case).
- Develop rapid-assessment protocols to complement humanitarian and reconstruction efforts.

4.9 Marine and Coastal Action Group

4.9.1 Moderator

- Ghada El Serafy, Deltares

4.9.2 Session overview

This session introduced the concept of an EuroGEO Marine and Coastal Action Group (MC-AG), in the process of being established, and outlined its draft strategy, activities, and opportunities for collaboration. The session aimed to:

- Present the initial vision and structure of the new Action Group;
- Highlight existing European GEO activities relevant to the marine and coastal domain;
- Gather input on strategy priorities and identify missing components and key partners;
- Encourage participants to join and co-design the initiative.

The structure included two introductory presentations to set the scene, followed by a short strategy discussion and interactive input round using Slido.

4.9.3 Discussions

4.9.3.1 GEO AquaWatch – European Activities

Dr El Serafy presented ongoing AquaWatch Europe efforts as a key contributor for the new Marine and Coastal Action Group.

- Aim: Advance water-quality monitoring from inland to coastal environments.
- Approach: Integrate four components — in situ observations, modelling, satellite EO, and citizen science.
- Data-to-Knowledge Pathway: Transform raw data into actionable knowledge to support management and policy decisions.
- Synergies: Builds on knowledge from previous EU projects such as MONOCLE, CERTO, DANUBIUS-RI, DOORS (Black Sea), Water-FORCE, PRIMEWater, and EO4UKWater.
- Open challenge: How to fill existing data and capacity gaps to support operational services.

4.9.3.2 GEO Blue Planet – European Node

The European component of GEO Blue Planet (EU4OceanObs Horizon Project) was presented as a key contributor for the Action Group.

- Objective: Bridge the gap between marine data and societal needs by converting ocean data into actionable information.

- Secretariat: Shared between Korea, the United States, and Europe.
- Topics covered: marine litter, sargassum blooms, coastal change, eutrophication, and climate adaptation.
- Core activities:
 - Stakeholder engagement
 - Cooperation and co-design (e.g. Sargassum Information Hub, IMDOS).
 - Capacity development

4.9.4 Draft Strategy Discussion

Participants reviewed the draft Marine and Coastal Action Group Strategy (2024–2030) around three main pillars:

- Mapping: Ensure policies are informed by marine information databases that deliver actionable insights to decision-makers.
- Engagement: Strengthen collaboration with aligned EU projects and promote co-design processes supporting data to actionable knowledge for decision making.
- Sustainability Guidelines: Develop practical guidance for sustaining data, tools, and knowledge frameworks, and measuring impact.

Using Slido, participants discussed priorities and missing elements:

- Need for a clear operational implementation plan toward 2028–2030.
- Strong interest from early-career participants to contribute.
- Greater emphasis on wetlands and marine–coastal biodiversity, linking to other Action Groups.
- Inclusion of social sciences to understand human–environment interactions.
- Vision for an integrated Earth Intelligence System that mobilises data and knowledge to solve real-world problems.

Key actors and projects proposed for inclusion:

- AquaWatch Australia, JMP-EUNOSAT, DG INTPA Oceans, DEIMOS / Indra, NECCTON (Horizon project), Copernicus Marine Service & Coastal Hub, HELCOM, OSPAR, EMODnet, among others.

Examples of relevant ongoing activities:

- SDG 14.1.1a — satellite-derived coastal eutrophication indicators.
- COCLICO (Horizon project) — tool to manage and plan responses to sea-level rise.
- EU4OceanObs / GEO Blue Planet EU Office — Sargassum Information Hub developed with Caribbean partners for monitoring and forecasting.

4.9.5 Discussion Outcomes

- The Action Group's mission was endorsed as a needed bridge between the marine, coastal, and societal domains.
- Participants emphasised that integration across observation systems and disciplines (including social sciences) is essential to link environmental change to human impact.
- There was strong support for maintaining the open, inclusive, and user-driven approach that characterises GEO Blue Planet and GEO AquaWatch.
- Students and early-career professionals expressed enthusiasm to contribute, underlining the importance of capacity development.

4.9.6 Specific recommendations to EuroGEO

4.9.6.1 Support establishment and consolidation of the Marine and Coastal Action Group

- Formally recognise MC-AG as part of EuroGEO's coordinated contribution to GEO's ocean agenda.
- Provide a clear operational roadmap toward 2030.

4.9.6.2 Promote integration across domains and disciplines

- Link marine and coastal data streams with inland, biodiversity, and climate initiatives.
- Embed social-science expertise to connect EO information with societal impacts and policy needs.

4.9.6.3 Foster collaboration and co-design

- Engage European and international partners (e.g. Copernicus Marine Service, NECCTON, EMODnet, HELCOM, OSPAR) in shared pilots and data-information-knowledge frameworks.

4.9.6.4 Build capacity and inclusiveness

- Continue supporting stakeholder engagement, citizen science, and early-career involvement to ensure long-term sustainability.

4.9.6.5 Ensure data sustainability and transparency

- Develop practical sustainability guidelines for marine and coastal EO tools, ensuring open access and measurable impact.



Closing statement by Nicolas Fichaux, EuroGEOsec coordinator, Mines Paris PSL/ARMINES.

EuroGEO, I have one word to share with you : "Stories"

Stories and rituals are defining humanity. Stories and rituals are bonding cultures and civilisations. We do have a ritual, which is gathering to the EuroGEO workshop. This year we worked on the stories.

This year, we built a new narrative where Earth Intelligence is bringing Earth Observation to its next level. A Vision where our efforts are helping our societies to address global challenges. In this Vision research institutes, companies, public authorities, institutions collaborate, to the benefits of citizens

And I've heard only one voice: "I wanna help, I wanna join, I wanna build my own story" ... into this new narrative.

So let's do that. You will be going home with that narrative. It will shape your mindset, it will change your sight and you will inspire others. Once home, you are going to build on the partnerships you have started here, on the breakthroughs you saw, on the projects you encountered.

Little by little, you are going to build your own new story into our common narrative, and all our stories together are going to transform earth observation into earth intelligence across our continent and beyond.

This is what EuroGEO workshop is really about. This is why we gathered here, and this is what we are achieving collectively. Now is the time to thank our storytellers and storymakers.

Our chairs and speakers, EuroGEO action group leaders, European Commission, Horizon projects, Copernicus Entrusted Entities, DestinE, Intergovernmental Organisations, National GEOs, GEO Secretariat, GEO Work Programme activities, NSO management, Dutch ministries and public authorities, projects and initiatives, SMEs, communicators, students. We had 200 interventions over three days.

Congratulations to you!

This event would not have been possible without the full support of the EuroGEO Secretariat consortium, with an engagement beyond duty. My sincere gratitude goes to ... Aspasia, Francesca, Tanya, Anastasia, Alexia, Mariza, Julia, Marie Françoise, Thierry, Lionel, Emmanuel, Haris, Lefteris, Nicola, Sergio, Nico, Piotr
Congratulations to you!

We also should thank our volunteers from University of Twente, Leiden University, and Silvia who came all the way from University to Florence to support us. Congratulations to you!

Finally, the NSO team who co-organised the event together with us this year, for their generous sponsorship and the staff they committed to the event. For a few months we were one single team, thanks to Coco, Patricia, Judith, Kees, Ruud, many others in the background such as the NSO notetakers.

Your commitment was enormous and extremely professional. I wish EuroGEO to have partners like you in the future. Team NSO, congratulations to you!

Finally let me extend our sincere gratitude to all of you who participated and came all this way to write our common story. EuroGEO, congratulations to you!



Annex: Audience feedback: The Vision for Earth Intelligence – From Policy to Impact (DAY 1)

The audience feedback shows moderate engagement (39% overall participation). Respondents identified user demand as the strongest driver for EO uptake, followed by policy frameworks, funding, and technology readiness. The main challenges reported were the transition from tester to paying customer (100% difficulty), followed by initial user engagement (62%) and integration of user needs (50%). The top barriers cited were an unfit-for-purpose business model (42%), insufficient funding (23%), and limiting regulations (19%).

1.1.1.2.1 Which driver has the strongest influence on EO uptake? – 80% participation

User demand > Policy frameworks > Funding > Technology readiness

1.1.1.2.2 How much difficulty do you face in addressing the following?

- Initial user engagement - 62% difficulty
- Incorporation of user needs into solution design process - 50% difficulty
- Transition from tester to paying customer - 100% difficulty

1.1.1.2.3 Key barriers for uptake

Unfit-for-purpose business model (42%) > Insufficient funding (23%) > Limiting regulations (19%) > Operational capacity (16%)

1.1.1.2.4 Best practices/stories to share with EuroGEO

- Greater integration of in-situ data with EO applications
- Acknowledge and address non-technical barriers to user uptake
- Open-source and shareable EO data (e.g., on GitHub)
- Explore sustainable business models for EO applications
- Example: Satmirol project (Statistics Poland) — harvest and hazard monitoring from pilot to operational use
- Dedicated product ownership supports effective project delivery
- Follow TerraWatch.com for EO insights
- Co-design requires strong communication skills, yet there's a growing shortage of qualified experts
- Hands-on support with co-design methodology
- Co-design is a structured process that delivers tangible results, not just a buzzword
- Make end-user engagement and responsibility integral to design

- Need for data quality standardisation and algorithm validation
- Prioritise funding for scaling up rather than just startups
- Assimilate EO-derived data into numerical models to fill gaps and improve multi-sector predictions
- Provide public satellite imagery to strengthen regional awareness and support the space sector
- Co-create a common observation strategy (EO, in-situ, modelling) — e.g., HE project LandSeaLot (LandSeaLot.eu)
- GEO-LDN: strong policy mandate linking national stakeholders with global EO and UNCCD frameworks
- Maintain close ties with end users to ensure market adaptability and usefulness
- The EU is leading the global open EO movement and demonstrating collaborative green governance
- Example: Cooperation between Audit Institutions, Aceh Reconstruction Agency, and University of Twente to assess tsunami aid using EO and field data
- Share “Brilliant Failures” to learn from what didn’t work (e.g., untested willingness to pay)
- EUMETSAT as a historic example of co-design between meteorological services and satellite experts
- Co-design remains key to effective EO solution development
- Support from World Bank and ESA in gathering user needs
- User demand patterns and standardisation drive interoperability and scalability (e.g., PCP-WISE.EU)
- Integrate and combine analytical services for synthetic, higher-level insights
- Increase end-user participation in action groups
- Improve integration with other data sources
- Market segmentation and structuring of user communities are fundamental
- Encourage private investment in SMEs to create larger operational units
- CARTO project (Spheerai, TU Delft, Northern Provinces): AI-driven ecological monitoring via PPP
- ESA–City of Paris collaboration: good demo, but need strategies for scaling up and expanding to other cities



1.1.1.2.5 From R&I to the market, what type of support would you appreciate the most coming from EuroGEO?

- Support for accessing EU funding for GEO Work Programme activities, particularly GEO Flagships
- Facilitation of interaction between public and private sectors
- Funding research and innovation along the value chain through flexible, non-institutional approaches
- Hands-on support with co-design methodologies
- Collection and analysis of user requirements
- Standardisation, validation, and certification mechanisms
- Mechanisms for standardisation by user segment and EO product-market combinations to enhance interoperability, acceptance, and scalability
- Benchmarking and assessing the effectiveness of business models
- Initiatives to increase community participation and strengthen communication capacity among experts
- Inclusion of more end users in action groups
- Co-sponsored events connecting SMEs and investors
- Showcasing how geospatial data strengthens democracy, improves policy impact, and enhances accountability

