EuroGEOSec – CS#1: Policy-to-market EO capabilities overview

Contents

List of Acronyms 1
1. Executive Summary 1
2. Purpose 2
3. Contextual Framework 3
4. Methodology 3
5. Results 3
6. Analysis 4
7. Conclusions and Next Steps 4

List of Acronyms

Acronym	Description
BioSpace	Stakeholder workshop focused on biodiversity and Earth Observation implementation challenges, hosted by the European Space Agency in Feb. 2025
Copernicus	European Union's Earth Observation Programme
CS1	Case Study 1 developed under the EuroGEOSec project
EARSC	European Association of Remote Sensing Companies
EO	Earth Observation
ESA	European Space Agency
EU	European Union
EuroGEOSec	EuroGEO Secretariat
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
KCEO	Knowledge Centre on Earth Observation
NRR	Nature Restoration Regulation
NGO	Non-Governmental Organisation
WP3	Work Package 3

1. Executive Summary

This case study examines how the EuroGEO community can be supported in **navigating the fragmented Earth Observation (EO) landscape** that promotes the implementation of **new environmental legislation**, with a specific focus on the Nature Restoration Regulation (NRR). The NRR combines overarching restoration objectives with binding restoration targets for specific habitats and species. The regulation mandates the restoration of 20% of all EU land and sea ecosystems by 2030, and the restoration of all degraded ecosystems by 2050. The regulation covers specific targets for, i.e., wetlands, forests, grasslands, rivers and lakes, and other habitat types. It also seeks to reverse the decline of pollinator populations, increase forest ecosystems, ensure no net loss of green urban space and tree cover by 2030, increase grassland butterflies and farmland birds, the stock of organic carbon in cropland mineral soils, and the share of agricultural land with high-diversity landscapes. As regards marine ecosystems, the NRR outlines the restoration of marine habitats such as seagrass beds or sediment bottoms, which deliver benefits for climate change mitigation, and outlines the restoration of habitats for marine species.

It also seeks to identify and remove barriers that impede connectivity among surface waters, so that at least 25,000 km of rivers are restored to a free-flowing state by 2030.[1]

The regulation also requires Member States to draft their own National Restoration Plans, to be delivered to the European Commission by September 2026. As the NRR covers a wide range of ecosystems and the needs and requirements will vary per country, these should outline how the countries will monitor and report on their progress and address the country-specific restoration initiatives per country. EO constitutes a key enabler for the monitoring of many of these ecosystem metrics, but the wide range of ecosystems covered under the regulation and the many requirements often present challenges for the stakeholders.

Across policy, industry, and research communities, **EO capabilities** for biodiversity monitoring, relevant to the NRR, are **often perceived as difficult** to identify, compare, and operationalise. This is not due to a lack of EO data or technical maturity, but rather to the way information on EO services is **distributed across multiple platforms**, initiatives, and communities, each using different terminologies and entry points. As a result, users face a fragmented landscape that makes it difficult to understand which EO solutions are fit for purpose to address different aspects of the NRR, market-ready, or aligned with specific regulatory obligations.

Within this context, CS#1 was developed under Work Package 3 of the EuroGEOSec project to explore whether **consolidation and sense-making** could help bridge the gap between policy requirements and EO market offerings. Building on work carried out within the **EARSC Biodiversity Working Group**, analytical outputs from the Knowledge Centre on Earth Observation (KCEO), and discussions held during the BioSpace workshop, the case study contributes to the development of a structured, work-in-progress reference resource, the NRR: EARSC EO Services Database. This resource aims to improve visibility of EO capabilities relevant to the NRR and to support stakeholders in navigating from regulatory intent to practical application. In doing so, the case study illustrates a potential facilitation role for EuroGEO at the policy–market interface.

2. Purpose

CS#1 is positioned within the **Operational Pipeline "From Policy to Market"**, which focuses on situations where policy frameworks create **new demand for EO-enabled solutions**, but **users struggle** to translate that demand into concrete procurement, deployment, or service uptake. The **NRR** provides a particularly illustrative example of this challenge. Although the regulation indicates that Member States should rely on geospatial information and monitoring, and explicitly mentions, i.e., the use of the Copernicus Land Monitoring Service, there is limited operational guidance on how EO should be used, which datasets and services are appropriate, and how different solutions can be combined to support compliance. This issue is magnified by the fact that the NRR covers monitoring for so many different ecosystem types and metrics; what may be highly relevant for one Member State may not apply to another with different ecosystem characteristics.

Analysis conducted by the KCEO in its **Biodiversity Deep Dive**[2] indicates that this issue is not unique to the NRR but reflects a broader pattern across **biodiversity-related policies**. The Deep Dive covers mainly the EU Biodiversity Strategy, the strategic document that outlines EU goals for biodiversity conservation and restoration, many of which are then implemented through the NRR. In many cases, EO products and services partially address policy needs, yet users encounter difficulties related to accessibility, consistency of indicators, integration with in-situ or ancillary data, and the **absence of user-oriented guidance**. These challenges are compounded by the fact that EO capabilities are developed and communicated across diverse communities, including public Copernicus services, research projects, private-sector offerings, and policy support initiatives.

Against this background, the purpose of CS#1 is to **document and address the specific barriers** users face when attempting to apply EO solutions in response to the NRR. The case study seeks to consolidate fragmented EO-related information that already exists within the EuroGEO ecosystem, and to assess whether EuroGEO could add

[1] Nature Restoration Regulation, European Commission.
[2] https://publications.jrc.ec.europa.eu/repository/handle/JRC132908

value by improving clarity, orientation, and access at the interface between regulation and EO markets. The work is explicitly targeted at the wider **EuroGEO community**, encompassing policymakers and public authorities, EO solution providers, end users, and academic actors who are engaged in policy-relevant EO applications.

3. Contextual Framework

EuroGEO, Europe's regional contribution to the Group on Earth Observations (GEO), operates at the interface of research, policy, and markets. Through its community of public authorities, research organisations, and private companies, EuroGEO seeks to increase the uptake and impact of EO-based information in support of European and global policy objectives.

The **EuroGEOSec** project, launched in December 2023, aims to establish a permanent EuroGEO Secretariat capable of providing structured innovation and market development support to this community. As part of Work Package 3, a set of ten case studies has been designed to explore concrete support needs along the EO value chain, structured through five Operational Pipelines.

4. Methodology

The work undertaken in CS#1 followed a **qualitative, synthesis-oriented approach** focused on **consolidation** rather than the development of new EO data, tools, or analytical methods. The central methodological challenge was not to identify EO capabilities in isolation, but to bring together perspectives from policy, industry, and stakeholder engagement activities in order to better align EO offerings with regulatory needs.

Three main sources informed the analysis. First, outputs from the **EARSC Biodiversity Working Group**, including the evolving capabilities catalogue and associated reference tables, provided a market-facing view of EO services already available from private sector providers. These materials helped establish which capabilities are technically mature and commercially accessible, and how they are currently framed by EO companies. Second, the **KCEO Biodiversity Deep Dive** and related policy briefs offered a policy-side assessment of how existing EO products support EU biodiversity policies, highlighting recurring limitations related to accessibility, temporal and thematic consistency, and integration with non-EO data sources. Third, **insights from the BioSpace workshop**, co-organised with ESA's Stakeholder Engagement Facility, captured stakeholder perspectives on implementation challenges, including the need for clearer methodologies, standardised indicators, and guidance for policy implementation at national and regional levels. The consolidation process was supported by expert input and informal validation through engagement with EARSC members, national conservation authorities, NGOs, and EU-level stakeholders.

5. Results

The main outcome of the EARSC Biodiversity WG's work is the development of a curated resources, the NRR: EARSC EO Services Database, which links NRR requirements to relevant EO capabilities, services, and information sources. Rather than creating a new catalogue of EO solutions, the work focused **on reorganising existing information** in a way that reflects how regulatory users approach compliance questions, mapping the private sector capabilities to specific articles of the NRR, and the relevant ecosystem metrics.

The Biodiversity Working Group's **EO Services Database** highlights EO services that are already technically and commercially mature, but not necessarily visible to policy-facing users.[3] This work builds on insights from the KCEO Biodiversity Deep Dive, which provided important **context** on where these capabilities only partially meet policy needs, for example, due to **inconsistencies in indicators**, limitations in **temporal** coverage, or challenges in **combining** EO outputs with **in situ** and socio-economic data.

[3] https://earsc.org/2025/12/15/nature-restoration-regulation-earsc-eo-services-database/

Bringing these perspectives together enabled EO information to be structured around regulatory questions rather than technical categories. This shift in perspective helped clarify **what EO can realistically support** under the NRR, where complementary data or guidance is required, and where expectations may need to be managed.

6. Analysis

The analysis confirms that the main barriers to EO uptake for NRR compliance are not rooted in data availability or technological maturity, but in **usability, orientation, and translation**. This finding is consistent with conclusions from the KCEO Biodiversity Deep Dive, which emphasises that EO products often address policy needs only partially due to challenges related to accessibility, thematic granularity, and integration into decision-making workflows.

Discussions during the BioSpace workshop further highlighted that users, particularly **public authorities and non-specialist organisations**, often struggle to move from **high-level policy objectives** to concrete EO-enabled processes. In parallel, the work of the EARSC Biodiversity Working Group demonstrates that a wide range of EO companies already offer relevant services, but that these services are not always framed in ways that resonate with regulatory users or align clearly with compliance processes.

By focusing on consolidation and translation rather than technical development, CS#1 illustrates how **EuroGEO could help reduce these barriers**. Acting as a **neutral facilitator**, EuroGEO is well positioned to bridge the gap between policy language and EO market offerings, helping users understand what is available, what is fit for purpose, and how different capabilities can be combined in practice.

7. Conclusions and Next Steps

This case study demonstrates that **targeted consolidation** and sense-making can play a meaningful role in bridging the gap between policy requirements and market uptake of EO solutions. Using the NRR as a concrete example, the work shows that improving access to existing knowledge and capabilities can be as important as developing new EO technologies.

The Information Sources Guide provides a **practical example** of how EuroGEO could support stakeholders under the “From Policy to Market” Operational Pipeline.

Future work will focus on **refining and validating the resource** with a wider set of users, and on exploring the transferability of this approach to other regulatory areas where EO plays an increasingly important role.