ISPRA Istituto Superiore per la Protezione e la Ricerca Ambientale | Sistema Nazionale per la Protezione dell'Ambiente

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DATA FOR THE ENVIRONMENT ALLIANCE D E A L

co-hosted by esa THE EUROPEAN SPACE AGENCY

THIRD HIGH LEVEL EXPERT GROUP

Towards A Big Data Revolution for the Planet
From Uncertainty to Opportunity

08–10 July 2025 | ESA–ESRIN | Frascati (Rome), Italy

Concept Note

Scoping an Integrated, Tech-empowered, Cross-sectoral Approaches to Data Optimization, Governance and Access for a More Resilient World

In a rapidly shifting geopolitical context—marked by trade tensions, challenging energy transitions landscape, and policy uncertainty—the need for high-quality environmental data is greater than ever. Digitized, transparent, and independently verifiable environmental metrics can serve as stabilizing assets.

High-integrity environmental data is foundational to understanding the state of the global environment and to producing science-based tools for action by governments, investors, industries, regulators, and consumers.

They enable countries and companies to navigate fragmented regulatory landscapes while upholding environmental commitments. They also help illuminate infrastructure gaps, unlock financing for sustainable development, and accelerate green structural transformation.

With the convergence of advanced space and digital technologies we are entering an era where the quality, traceability, and usability of environmental data can be radically improved. These tools allow for real-time monitoring, cross-sectoral integration, and independent validation of environmental impacts and claims.

As environmental data becomes more granular, timely, and machine-readable, it enhances transparency, fosters accountability, and strengthens the foundation for multilateral cooperation and governance, including across sectors such as carbon markets, clean infrastructure, supply chain traceability, and ecosystem services.

To unlock this potential, a new approach is required—one that enables the integration of diverse and complex data sets from traditional and non-traditional sources. These include emissions inventories, satellite feeds, local community data, corporate disclosures, financial flows, and digital supply chain records.

Such integration must reflect not only the state of the environment but also the interconnected dynamics of socio-economic policy, industrial activity, technological deployment, investment strategies, and natural resource management.

We are at the threshold of a new world that requires rethinking data architectures, governance frameworks, and standards to support interoperability, comparability, and usability across geographies and platforms.

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Investors increasingly demand verified, third-party validated, and decision-useful data to evaluate risks and opportunities, especially in emerging markets where data availability and quality vary significantly. Robust data ecosystems also play a vital role in deterring greenwashing, reducing capital misallocation, and incentivizing meaningful sustainability action.

The UN Environment Programme will produce its Global Environmental Data Strategy against this challenging backdrop, to be presented to Member States at the UN Environment Assembly in December 2025.

Building on the work of the Second Expert Group on Big Data convened in Vienna in September 2023, the United Nations Science-Policy-Business Forum on the Environment and DEAL will convene the Third Meeting of the High-Level Expert Group on Big Data, under the theme "Towards A Big Data Revolution for the Planet: From Uncertainty to Opportunity".

The event will take place in Frascati from 8 to 10 July 2025, co-hosted by Italian Institute for Environmental Protection and Research (ISPRA) and the European Space Agency (ESA).

This meeting will bring together top experts to forge new pathways for deploying Big Data in support of planetary sustainability, cross-sector accountability, and economic transformation.

Meeting Objectives:

The meeting will focus on four main objectives, each addressing a key component of Big Data's role in environmental sustainability in a changing world:

1. Governance of the Global Environmental Data Strategy

This objective will focus on developing strategic guidelines for a global environmental data strategy governance after its final adoption at the UNEA-7. Effective environmental data governance is crucial for achieving multilateral environmental goals and ensuring that data resources are standardized and accessible to all, emphasizing equitable access and coordinated data-sharing mechanisms and creating frameworks that support interoperability and data accuracy on a global scale. Ensuring that all countries, particularly developing nations, can access and utilize environmental data is essential.

2. Environmental Big Data in the Global Digital Compact Framework and Structural Transformation

GDC seeks to promote a digital future that supports sustainability and inclusion. The meeting will explore how environmental data can be integrated within the GDC framework to advance sustainable digital transformation and economic growth to address global challenges. As the use of Big Data expands, so does the need for responsible data practices. Participants will discuss ethical considerations, including data privacy and security, to ensure that environmental data is used in ways that respect individual rights and contribute to sustainability.

3. Data for Green Investment, Accountability, and Transparency

As global environmental challenges converge with heightened geopolitical instability and shifting investor priorities, this session will spotlight how robust, transparent environmental data can support green markets, inform investors, and drive policy coherence.

Core Topics:

Investor-Centric Environmental Data: What types of high-integrity environmental data—including digital for environment—do investors need to support green and clean investment?

Third-Party Verification and Earth Observation: How methodologies like independent verification, satellite monitoring, blockchain, and digital traceability enhance trust and transparency in environmental disclosures.

Carbon Data Ecosystem: Challenges in aggregating and verifying carbon trading, carbon credits, carbon capture and storage data, especially at the intersection of global and local datasets. Successful examples (e.g., Climate TRACE, Verra).

Digitalized and Accountable Supply Chains: How to digitize sustainability and materiality data, including for critical frontier sectors such as lunar and deep-sea mining.

Environmental Data Integrity in a Shifting Global Order: How Big Data accountability frameworks can counteract environmental policy regression, trade tensions, and governance voids.

Green Structural Transformation and Infrastructure Futures: Using data to map, finance, and monitor infrastructure needs and green tech market development in developing countries.

4. New Frontiers, New Gaps, New Opportunities

The world is changing fast and the dynamics of change required foresight and preparedness. Space data, for example, is quickly becoming the domain of private companies with little regulatory processes to govern data sharing, especially at a global scale. The trade wars and the retraction on environmental commitments are impacting access to and the generation of quality data.

From lunar mining, to deep-sea mining, and the data needs of a new plastics agreement our needs are rapidly changing so is the capacity to create the multilateral environment required for optimal cooperation.

The Expert Group will attempt to create a better understanding of the ever-changing dynamics and impact, outlining the scenarios to overcome anticipated challenges and find opportunity along the way.

Cross Cutting Issues:

- **Global Environmental Data Strategy: The Way Forward.**
- **What data architecture is needed to align green investment flows with verified sustainability outcomes?**
- **How can we enhance the interoperability of environmental data across various platforms and sectors to facilitate more effective data sharing and collaboration?**
- **What ethical considerations must be addressed to ensure the responsible use of Big Data in environmental contexts, particularly regarding data privacy and security?**
- **What innovative data-sharing practices can be adopted to enhance collaboration between the public and private sectors for improved environmental monitoring and decision-making?**
- **In what ways can artificial intelligence be leveraged to analyse environmental data, and how can we mitigate its associated energy demands and greenhouse gas emissions?**
- **What are the technologies, resources and capacities required to manage Big Data and transform the future of environmental action and economies towards a more sustainable path?**
- **How can Big Data and frontier technologies create better transparency and accountability across sectors, including Government, Investors, Industry, Consumers?**
- **What are the regulatory frameworks required to safeguard technology?**
- **UNEP Scientific Foresight Process: An Overview.**

A Global Environmental Data Strategy – A Short History

Recognizing the critical importance of data governance and equitable access, the Fourth Session of the UN Environment Assembly (UNEA-4) adopted a Ministerial Declaration in 2019, mandating the development of a Global Environmental Data Strategy by 2025.

Building on this mandate, at UNEA-5 in 2022, the Government of Estonia and the UN Science-Policy-Business Forum on the Environment (UN-SPBF) launched the Data for the Environment Alliance (DEAL)—a Member State- led initiative dedicated to empowering countries, communities, and industries to harness high-quality environmental data and frontier technologies to meet the environmental dimensions of the 2030 Agenda.

High-Level Expert Group on Big Data

United Nations Science-Policy-Business Forum on the Environment and DEAL are convening a Third Meeting of the High-Level Expert Group on Big Data, titled "Towards A Big Data Revolution for the Planet." Scheduled for 8 -10 July 2025 in Frascati and co-hosted by Italian Institute for Environmental Protection and Research (ISPRA) and the European Space Agency (ESA), this meeting aims to bring together top experts to advance strategies for leveraging Big Data to achieve global environmental sustainability.

Stakeholders

- Top Government Representatives
- UN Agencies
- Space Agencies and Earth Observation Centers
- Scientific and Research Centers
- Private Sector and Technology Giants
- Parliamentarians and Civil Society
- Asset Owners and Sovereign Wealth Funds
- Institutional Investors and Pension Funds
- Global Asset Managers and ESG Rating Agencies
- Development Banks and International Financial Institutions
- Citizen Science
- Academia
- Multilateral Environmental Agreements and Legal Experts

Interactive Format:

The High-Level Expert Group meeting will be structured over three days, with highly interactive sessions dedicated to each of the three objectives outlined above. Each day will include keynote presentations, panel discussions, breakout sessions. We hope that this collaboration will help us work together towards impactful transformation.

For information and expressions of interest, contact: william.thornton@un-spbf.org

About the Data for the Environment Alliance (DEAL)

The Data for the Environment Alliance (DEAL) was first launched in November 2021 at the COP26 in Glasgow and officially launched in March 2022 at UNEA-5 in Nairobi as a Member State led initiative that aims at empowering the delivery of the environmental dimension of the 2030 agenda by making high quality environmental data, big data and exponential technologies accessible and efficiently utilized by member states, society, and the industry.

About the UN Science-Policy Business Forum on the Environment (UN-SPBF)

The United Nations Science-Policy-Business Forum on the Environment (UN-SPBF) serves as a comprehensive, multi-sectoral, and inter-agency platform. Its primary purpose is to facilitate collaboration and dialogue among various sectors, including science, policy, and business, in the pursuit of environmental objectives.

Inaugurated during the third United Nations Environment Assembly (UNEA-3) in December 2017, the Forum was established to address the need for a more integrated and dynamic interaction among these sectors, as requested by Member States.

Regionally, the Forum extends its activities to the Asia-Pacific and Africa, aligning with environmental ministerial processes. Additionally, it functions as the Secretariat for both the Data for the Environment Alliance (DEAL) and the Expert Group on Big Data and Frontier Technologies.

For more information please visit: un-spbf.org

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