United Nations
Office for Outer Space Affairs

13 June 2025

Dear Ms. Hammarskjöld,

Object: UN Office for Outer Space Affairs inputs in relation to the resolution A/RES/79/144 concerning "oceans and the law of the sea" for the report of the Secretary-General to the eightieth session of the United Nations General Assembly

I am pleased to reply to your letter seeking inputs from the United Nations Office for Outer Space Affairs (UNOOSA) for the report of the Secretary-General on "Oceans and the law of the sea", as mandated by the United Nations General Assembly resolution 79/144 of December 2024, for the period from September 2024 to August 2025.

The Ocean is the life blood of our blue planet and satellite technologies are now among our most powerful tools for understanding it through monitoring and measuring its characteristics and changes in them. In addition, satellite imagery allows us to take definitive action against illegal fishing practices and plastic pollution as well as monitor sea level rise, coral bleaching, and harmful algal blooms. Space-based data is unmatched in global coverage and consistency. It enables early warning, smarter decision-making, and faster humanitarian response.

Today, over 60% of oceanographic and marine environment monitoring data comes from satellites, while more than 30 oceanographic satellites are currently in orbit, supported by an estimated 2 billion USD in investments.

But despite this abundance, six decades of experience using Earth observation, and the vital needs for space data, the potential of space technology remains largely untapped, and its benefits are not reaching those who need it most. Not all countries, especially those on the frontlines, have the capacity to access, interpret, and act on space data. In addition, populations remain largely unaware that such solutions exist as they do not have access to them, or they believe they never will.

In this context, UNOOSA, as the sole UN entity with a mandate entirely dedicated to space, has been helping developing countries access and leverage the benefits of space to accelerate sustainable development since 1958. Through its program on Space Applications and the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), UNOOSA uses its experience as a capacity-builder and global convener to support developing countries to build capabilities to make the most of the space technologies and data, including to prevent and manage ocean-related disasters.

Our contribution to the General Assembly resolution 79/144 mainly regards the implementation of its section II and XI relating to capacity building and marine science and can be found in Annex I of this letter.

I would be grateful if our inputs could be reflected, wherever possible, in the report of the Secretary-General on "Oceans and the law of the sea" prepared in the occasion of the eightieth session of the United Nations General Assembly. We also hereby agree to make the

full text of our contribution available on the website of your Division. This constitutes a key opportunity to show how space data can empower ocean action for resilience, sustainability, and the generations to come.

I wish to take this opportunity to convey to you, Madam, the assurances of my highest consideration and support.

Aarti Holla-Maini

Director

United Nations Office for Outer Space Affairs

Ms. Elinor Hammarskjöld

Under-Secretary-General for Legal Affairs and United Nations Legal Counsel

Annex I. UN Office for Outer Space Affairs inputs in relation to the resolution A/RES/79/144 concerning "oceans and the law of the sea" for the report of the Secretary-General to the eightieth session of the United Nations General Assembly

Section II. Capacity-building

UNOOSA has a long standing and globally recognized experience as a a capacity-builder for the benefit of non-spacefaring nations. Our contribution in this regard mainly stands in the two projects below.

The Space4Water project:

The Space4Water Project started in 2008 with the aim of promoting the use of space-based technology and data for increased access to water. The project operates under three distinct objectives:

- Foster scientific exchange, especially between academia and governmental institutions via conferences, to inform decision making and have an impact on policy (science diplomacy);
- Reach and inform users worldwide, via the Space4Water Portal, to show-case scalable work and allow users to find partners based on their expertise or regional focus.
- Build an interactive community of Space4Water practitioners with the organization of stakeholder meetings with the aim of creating an Experts Committee for Quality Assurance and Scientific Guidance.

The project implements the following specific activities:

- **The conference series:** international conferences addressing use of space technologies and data in water management are organized once every two years, with five conferences successfully organized since 2008, in Saudia Arabia, Argentina, Morocco, Pakistan, Ghana, and Costa Rica.
- **Knowledge management through the Space4Water Portal** (https://www.space4water.org/): the portal is a multi-stakeholder gateway that gathers resources related to the use of space data for water-related challenges. The portal shares information on projects, initiatives, satellite missions, software, and community portals, and includes capacity building and training material as well as news and publications in the sector. The portal also serves as a support for the Space4Water Community where stakeholders can connect. Water related challenges globally collected from the community are published, as well as the co-designed space-based solutions.
- **Community building**: UNOOSA organises stakeholder meetings and events such as the participatory workshop for indigenous women on their roles and responsibilities related to water to strengthen the community, to assess user needs and allow to address issues within the community of stakeholders.

The Space4Water Portal intends to bridge lived challenges with solutions. In this regard, a first country case study on the use of space technology for water management, hydrology and ecosystem preservation was published in 2025, with a few more in development. In addition,

the project wrote and published several articles on the Portal on the use of space-based data to address ocean-related challenges:

- Mapping mangrove forests on small islands using Earth observation technologies from space;
- Digital Twin solution for realistic sea level rise simulation;
- Exploring the use of space-based technologies to monitor global sea level changes;
- Earth observations for mangrove restoration;
- Space-based observation helps improving climate modelling;

From September 2024 to August 2025, stakeholder meetings have generated hands-on interaction for the co-design of space-based solutions in an interdisciplinary and multi-stakeholder way. Three challenges, along with their respective draft solutions, directly related to oceans. More specifically, stakeholders have worked on concrete space-based solutions to monitor mangrove in the Caribbean, assess hydrocarbon contamination in Nigeria, and simulate sea-level rise of the Nile Delta region with a focus on Alexandria in Egypt.

The United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER):

In its resolution 61/110 of 14 December 2006 the United Nations General Assembly agreed to establish UN-SPIDER as a new United Nations programme with the mission of ensuring that all countries and international and regional organizations have access to and develop the capacity to use all types of space-based information to support the full disaster management cycle. Located in Vienna (Austria), Bonn (Germany), as well as in Beijing (China), UN-SPIDER is being implemented as an open network of providers of space-based solutions to ensure access to and use of space technologies and data during all phases of the disaster management cycle, including ocean-related disasters such as tsunami, sea-level rise, and coastal degradation.

The UN-SPIDER programme is achieving this by:

- ⇨ Being a gateway to space information for disaster management support;
- ⇨ Serving as a bridge to connect the disaster management, risk management and space communities;
- ⇨ Provide capacity-building and institutional strengthening support, in particular for developing countries.

The project implements the following specific activities:

- ⇨ **Technical advisory support including advisory missions and institutional straightening**
- ⇨ **Knowledge management through the UN-SPIDER Knowledge Portal** (www.un-spider.org): The Knowledge Portal remained a key platform in 2024, hosting nearly 9,700 resources including case studies, training materials, and data tools. With improved navigation and expanded multilingual content, it supported over 29,000 monthly users from across the globe. Regional Support Offices and partners contributed actively, helping disseminate best practices and promote the use of space-based solutions in disaster risk management.

- **Support in crisis situation with access to satellite data:** UN-SPIDER provides rapid support during emergencies by facilitating access to satellite imagery and analysis.

From September 2024 to August 2025, UN-SPIDER has developed digital twin solutions to simulate sea-level rise and flood scenarios using AI and very high-resolution satellite imagery. In Tonga, a realistic sea-level rise simulation was developed in collaboration with the private sector, enhancing national disaster preparedness under the EW4All initiative. In Ghana and Trinidad and Tobago, high-resolution digital twin products were created to model building-level flood impacts. These include 3D simulations and flooding videos using data from 30 cm satellites and AI-based footprint detection, contributing to more accurate DRM strategies.

In March 2025, following the magnitude 7.7 earthquake that struck Myanmar near Mandalay, UN-SPIDER activated its emergency support mechanisms. UN-SPIDER supported UNOCHA and national authorities by providing satellite imagery tasked by space industries and by ensuring that damage assessment maps produced by academic and private partners were made accessible to government agencies and humanitarian actors, enhancing situational awareness and response coordination (https://www.un-spider.org/news-and-events/news/myanmar-earthquake-un-spiders-disaster-response).

Section XI. Marine Science

UNOOSA is a global convener. As Secretary of the Committee on the Peaceful Uses of Outer Space (COPUOS) and the lead of UN-SPACE, UNOOSA facilitates global cooperation among UN Member States as well as among UN system entities. Since its creation, UNOOSA has been acting as a gateway between the space sector and the UN Member States to support their needs and the 2030 Agenda.

The Space4Ocean Alliance:

Initially proposed by the French Space Agency, the Space4Ocean Alliance aims at connecting the space and marine communities to ensure that satellite data delivers its full potential for the protection, preservation, and conservation of the ocean, especially for Small Islands Developing States (SIDS) and Least Developed Countries (LDCs).

As a founding member of this initiative, UNOOSA has been working since December 2024 with the French Space Agency, the Maldives Space Research Organization, the Space Office of the Principality of Monaco, the Norwegian Space Office, the European Space Agency, and the Intergovernmental Oceanographic Commission of UNESCO (UNESCO/IOC) to define the objectives and mandate of the Space4Ocean Alliance according to the needs of those who need it the most, particularly frontline countries. The third United Nations Ocean Conference (UNOC3) was identified as a key momentum to present and officially launch the Alliance.

In strong collaboration with the founding members, UNOOSA provided expertise and guidance extracted from its own experience as a capacity-builder to develop the concept note of the Alliance as well as a Declaration of Interest to be signed by any entity wishing to join it. In addition, UNOOSA used its global convener mandate to socialize the concept of the Alliance and bring in many developing nations.

As per the objectives agreed by the founding members, the Alliance will operate as an international consultation mechanism and platform for expert-level and high-level exchanges

to promote the concrete use of space capabilities for the preservation, protection and conservation of the ocean. Specifically, the Alliance intends to:

- Connect the space sector with marine, maritime and other relevant stakeholders;
- Better respond to needs and priorities for an improved sustainable management of the ocean and coastal areas;
- Advocate for implementation of innovative space missions to fill ocean observation gaps, as well as complementary in-situ measurements;
- Share good practices, facilitate and promote access to ocean observations (satellite and in-situ data), models and their joint use, propose proven operational applications and strengthen the underpinning ocean science for the development of tailored services;
- Develop capacity building actions and training initiatives for the benefit of ocean stakeholders both in terms of data access and operational services, especially in frontline countries such as the LDCs and SIDS;
- Inform the state and health of the marine environment by contributing to and advocating for the development of local, regional and global ocean indicators to be considered by appropriate organizations and to be used by decision makers.

The Declaration of interest was signed by 26 entities from around the world on 9 June 2025 and the Space4Ocean Alliance was officially launched on 13 June 2025 during the high-level side event entitled “One Earth, One Ocean: building a Space4Ocean Alliance” organized by UNOOSA in collaboration with the founding members in the margins of UNOC3.

This high-level side event gathered signatory ministers and heads of space agencies and culminated in the official handover of the signed Declaration of Interest to M. Peter Thomson, UN Secretary General's Special Envoy for Ocean, which sealed the official kick-off of the Alliance.

Grounded in science and leveraging space data, in-situ measurements, and advanced digital models, the Alliance will address critical ocean and coastal challenges, directly contributing to SDG 14, and supporting the UN Decade of Ocean Science for Sustainable Development.

UNOOSA will ensure its commitment to the Space4Ocean Alliance remain strong to make the case for many more non-spacefaring nations to join the Alliance to both contribute to and benefit from this endeavour.