# SPACE SOLUTIONS FOR THE PACIFIC

PROJECT OUTCOME REPORT 2018-2019





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# **EXECUTIVE SUMMARY**

The "Space Solutions for the Pacific" project was established in order to facilitate the re-engagement of the United Nations Office for Outer Space Affairs (UNOOSA) with the Pacific region. By means of this project, UNOOSA aimed to improve understanding of how stakeholders use space-based solutions to support sustainable development and thus identify priority areas to accelerate sustainable development in the region through the enhanced use of space. The project reviewed the past knowledge UNOOSA has of the region and enabled the creation of links between UNOOSA and Pacific stakeholders, including national representatives, the Pacific Community (SPC) and other United Nations entities.

For example, UNOOSA staff contributed to the 2018 SPC Geospatial Information Systems and Remote Sensing annual conference. In 2019, SPC supported the delivery of a UNOOSA capacity-building workshop on global navigation satellite systems (GNSS) for Pacific Island Country (PIC) representatives. SPC also contributed to a side event at the sixty-second session of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS). Finally, with the support of UNOOSA funding, SPC staff also participated in the 2019 United Nations/Austria Graz Symposium "Space: A Tool for Accessibility, Diplomacy and Cooperation." New institutional links to the United Nations system entities present in the Pacific, most notably with the United Nations Development Programme (UNDP) in the field of disaster risk reduction and the United Nations Resident Coordinator's team, in Suva, Fiji have also been made.

Based on the results of stakeholder engagement, UNOOSA is now in a better position to propose future space-based solutions and programmatic activities that can positively affect sustainable development in the region. Three policy areas were identified in which the expansion of space-based solutions offers the greatest impact: disaster risk reduction, coastal management and illegal, unreported and unregulated fishing. The first two of these policy areas were presented as priorities to define any future UNOOSA activities in the region.

Within the existing project time frame, UNOOSA has already started delivering some initial services to PICs in these areas, the most notable being disaster risk reduction. In this field, UNOOSA is now working with a number of PIC national focal points to secure national "authorized user" status for their respective countries with regard to the International Charter "Space and Major Disasters".

In summary, the project opened numerous reciprocal communication channels between UNOOSA and stakeholders in the region and has made concrete steps towards strengthening the Office's understanding of – and links to – the Pacific.

#### Simonetta Di Pippo

Director, United Nations Office for Outer Space Affairs

UNOOSA Director Simonetta Di Pippo. Credit: UNIS

# INTRODUCTION

As the United Nations gateway to space, UNOOSA works to bring the benefits of space science and technology to everyone, everywhere. The programmatic activities of UNOOSA provide space solutions for real-world problems by enhancing capacity to use space-based technology applications to accelerate the achievement of the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs).

Recent research¹ shows that the use of space-based solutions is fundamental to the implementation, monitoring and reporting of progress towards the SDGs. In this context, UNOOSA can offer Pacific island countries (PICs) a range of programmatic services to enhance their ability to meet SDG targets, including climate change (SDG 13), illegal fishing (SDG 14), telecommunications (SDG 9), global health (SDG 3) and disaster risk reduction (SDG 11). These services range from technical advisory missions that identify ways of increasing capacity to access and use space-based information to institutional strengthening missions that enhance domestic institutional capacity to make space-informed policy decisions. Furthermore, UNOOSA – working in partnership with the Pacific Community (SPC) and UNDP – is well-positioned to also link PICs with third-party space solution providers from the commercial space sector, national space agencies and other United Nations entities.

The project aims were to:

- Map recent and ongoing space solution programmatic activities in the Pacific
- Evaluate current capacities of PICs to analyse, interpret and use space-based data and information, and employ space-based solutions
- Identify priority user needs
- Match user needs with proposed UNOOSA programmatic activities and other relevant third parties to provide sustainable space solutions in the Pacific

The guiding principles for implementation were to:

- Enhance the capacity of PICs to meet the 2030 sustainable development agenda
- Increase collaboration between host governments, UNOOSA, SPC, UNDP, international organizations and other relevant actors and United Nations entities in the Pacific, while avoiding duplication of existing activities
- Establish the institutional and infrastructural needs of PICs to expand their use of space solutions for the SDGs
- Work collaboratively with SPC, UNDP and others to build on existing knowledge from UNOOSA technical advisory missions to Pacific island countries

<sup>&</sup>lt;sup>1</sup>ST/SPACE/71: UNOOSA and GSA: Building Blocks towards the 2030 Agenda, Vienna 2018.

# IMPORTANT TERMS AND ENTITIES

The Pacific Community (SPC): Originally called the South Pacific Commission, SPC was founded in Australia in 1947 by six participating governments that then administered territories in the Pacific Islands region: Australia, France, the Netherlands, New Zealand, the United Kingdom of Great Britain and Northern Ireland and the United States of America. Since then, membership has increased to 26 country and territory members. The focus of SPC is on major cross-cutting issues such as climate change, disaster risk management, food security, gender equality, human rights, non-communicable diseases and youth employment. Using a multisector approach in responding to our members' development priorities, SPC draws upon skills and capabilities from around the region and internationally, and supports the empowerment of Pacific communities and the sharing of expertise and skills between countries and territories.

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

Established in 2006 under UNOOSA, UN-SPIDER develops solutions to address the limited access developing countries have to specialized technologies that can be essential in the management of disasters and the reduction of disaster risks. It is the mandate of UN-SPIDER to enable developing countries to use all types of space-based information in all phases of the disaster management cycle including prevention, preparedness, early warning, response and reconstruction.

#### Committee on the Peaceful Uses of Outer Space (COPUOS):

The only committee of the General Assembly dealing exclusively with international cooperation in the peaceful uses of outer space, with a current membership of 92 States (as of September 2019), COPUOS was set up in 1959 to govern the exploration and use of space for the benefit of all humanity: for peace, security and development. The overall mandate of the Committee and its two Subcommittees (Scientific and Technical Subcommittee and Legal Subcommittee) aims at strengthening the international legal regime governing outer space, resulting in improved conditions for expanding international cooperation in the peaceful uses of outer space. The mandate also specifies that the Committee should support efforts at the national, regional and global levels, including those of entities of the United Nations system and international space-related entities, to maximize the benefits of the use of space science and technology and their applications. UNOOSA has been acting as the Secretariat of COPUOS since 1962.

**National Disaster Management Office:** A generic term used to describe the leading national authority on disaster management-related issues.

**Earth observation:** Earth observation is the gathering of information about planet Earth's physical, chemical and biological systems. It involves monitoring and assessing the status of, and changes in, the natural and man-made environment. In recent years, Earth observation has become more and more sophisticated with the development of remote-sensing satellites and increasingly high-tech "in-situ" instruments.

#### Project implementation breakdown | 2018 – 2019 milestones

#### **OCTOBER 2018**

Project webpage launched

#### **FEBRUARY 2019**

Presentation of initial results of mapping exercise

#### **JUNE 2019**

Delivery of UNOOSA capacity-building workshop on GNSS, with support from SPC

#### **NOVEMBER 2018**

Mission to Suva, Fiji for direct stakeholder engagement and participation during SPC Geospatial Information Systems and Remote Sensing annual conference

#### **JUNE 2019**

Presentation of initial findings to COPUOS



#### **SEPTEMBER 2019**

SPC attendance at the United Nations/Austria Symposium on "Space: a tool for Accessibility, Diplomacy and Cooperation"

#### Baseline research, including a review of past UNOOSA activities in the Pacific

The preliminary baseline research for the project drew on the review of all previous work conducted by UNOOSA in the region, especially with regard to disaster management and emergency response, enriched by opportunities and initiatives offered by other actors, local, regional and international. The objective of the research was to establish knowledge baselines and extract lessons learnt from past initiatives in the region, which had been almost exclusively focused on disaster risk reduction.

As the main implementation programme of UNOOSA for disaster management and emergency response, UN-SPIDER has an extensive presence in the region. Its approach is to develop on-the-ground capacity through technical advisory missions for governmental and non-governmental stakeholders. Working closely with these stakeholders, the UN-SPIDER team develop recommendations and guidelines, tailored to particular national needs, for enhancing the use of space-based information for disaster management. Over the last 10 years, UN-SPIDER has delivered a number of such missions in the Pacific, developing an understanding of the particular threats facing PICs.

# Stakeholder engagement at the Pacific Community Geospatial Information Systems and Remote Sensing annual conference

Organized by SPC, the 2018 edition of this annual conference was held in Suva, Fiji at the University of the South Pacific. It was an opportunity to convene the largest gathering of geospatial information systems and remote-sensing practitioners and policymakers, the private sector and civil society stakeholders from across the Pacific.

At the conference, the Chief of the UNOOSA Space Applications Section was invited to deliver a presentation on the opening day, introducing delegates to the work of UNOOSA, as the home of space affairs in the United Nations system. The presentation was well received and featured in the local media. UNOOSA also contributed to the conference's "poster session", joining other institutional representatives in presenting their activities to fellow attendees.

Throughout the conference, UNOOSA staff conducted a series of bilateral discussions with key stakeholders at national and regional levels. The focus of these discussions was on gathering information on ongoing activities aimed at using space-based solutions to support sustainable development in the Pacific Region. The discussions were structured around the framework of a standardized survey designed to identify priority areas for enhanced use of space-based solutions in the context of the SDGs. Delegates were also asked for their views on suggested areas of focus for future space-based solution projects in the region, with a view to contributing to the design of phase two of the "Space Solutions for the Pacific" project.

Outside of the conference, its presence in the Pacific also allowed UNOOSA to engage directly with United Nations entities in the field, including meetings with SPC senior management, the United Nations Resident Coordinator and UNDP representatives.



#### Institutional partnership-building

Besides direct stakeholder engagement with the national representatives during the project, UNOOSA was also able to strengthen connections with a number of regional Pacific institutions. The developments in this area are summarized below and include some inter-institutional joint activities that were established as a result of the project and are set to continue independently of the immediate time frame of the project.

#### **United Nations Development Programme**

The mission to the region in November 2018, facilitated encounters with various actors from the United Nations system present in the Pacific. Most notably, a connection was established with the United Nations Resident Coordinator's office and the UNDP team who at the time were in the Pacific, delivering disaster risk reduction programmatic activities.

As a result of these connections, UNOOSA has secured formal links to the United Nations system working on the ground in the Pacific, including through the opportunity to contribute to regular multi-agency coordination mechanisms in the Pacific. It is proposed that any activities implemented as part of future phases of the "Space Solutions for the Pacific" project will be undertaken with the support and full consultation of this multi-agency coordination mechanism run under the direction of the United Nations Resident Coordinator's office in Suva, Fiji.

#### **Pacific Community**

The "Space Solutions for the Pacific" project has enabled significant developments to be made in building institutional links between UNOOSA and SPC. This partnership delivered a number of outcomes during the project time frame.

At the start of 2019, UNOOSA and SPC exchanged network information for nationally appointed contact points on disaster risk reduction, through the respective SPC and UNOOSA/UN-SPIDER network mailing lists. Such actions allow SPC and UNOOSA to expand their contact network to global and Pacific-based disaster risk reduction community contacts respectively.



### UNOOSA Global Navigation Satellite Systems workshop, Suva, Fiji, June 2019

In June 2019, the institutional links mentioned above helped support delivery of a UNOOSA global navigation satellite systems (GNSS) workshop in Suva, Fiji. The workshop on the applications of GNSS formed part of the activities UNOOSA carried out through the United Nations Programme on Space Applications. It was hosted by the University of the South Pacific with sponsorship from the Government of the United States and the European Commission through the International Committee on GNSS. Collaboration with SPC was used to increase awareness of the workshop among PICs. A total of 89 participants from 23 countries attend the workshop.

The workshop focused on the importance of and need for cooperation in applying GNSS solutions through the exchange of information and the scaling up of capacities among countries in the Pacific region. Current and planned projects that use GNSS technology for both practical applications and scientific exploration were presented. Cooperative efforts and international partnerships for capacity-building, training and research were discussed.

Taking advantage of its presence in the region for this workshop, UNOOSA was also able to participate at the SPC Pacific Earth Observation Coordination Meeting, held in parallel on 25 June 2019. This meeting brought together key international and regional partners and stakeholders to discuss current Earth observation initiatives in the Pacific and opportunities to improve coordination and collaboration in support of Pacific island countries. The four discussion groups focused on identifying major issues, opportunities and challenges in the following four areas: capacity-building, data acquisition, data processing and crowdsourcing. Among the key outcomes to emerge from the discussions were a shared understanding of the capabilities and priorities to reduce redundancy and the maximization of the benefits of Earth observation tools and services in the region.

# "Space Solutions for the Pacific", side event at the United Nations Committee on the Peaceful Uses of Outer Space, June 2019

Thanks to the generous support of the Permanent Mission of New Zealand to the United Nations (Vienna), a side event was organized by UNOOSA at the sixty-second session of COPUOS with the aim of introducing the project to delegates. The objective was to raise awareness of the relevant activities undertaken in the Pacific among the member States of COPUOS and the diplomatic community in Vienna (a United Nations Headquarters) and invite interested parties to become involved in, and contribute to, the project.

The project was presented by a panel that included the Director of UNOOSA and the Permanent Representative of New Zealand to the United Nations who introduced the work of UNOOSA in the Pacific Region and the relevant role of New Zealand in the area. SPC also intervened, through the Director of the Geoscience, Energy and Maritime Department with a short video that explained local circumstances and stressed the timeliness of and need for space-based projects to fulfil the requirements of Pacific States. Subsequently, the Chief of the Space Applications Section of UNOOSA presented the concept of the project in detail, outlining its current status and future activities to be undertaken.

Audience members had the opportunity to ask questions about the project and discuss potential contributions and participation, both during the event and afterwards, at the networking event, which was kindly sponsored by the Permanent Mission of New Zealand to the United Nations (Vienna).

# SPC participation at the United Nations/Austria Space Symposium, September 2019

The "Space Solutions for the Pacific" project was presented several times – during informal discussions with interested parties, as well as on more formal occasions, such as the twenty-fifth United Nations/Austria Symposium "Space: A Tool for Diplomacy, Accessibility and Cooperation". This event took place in Graz, Austria, from 2-4 September 2019 and included a specialized session on "Space Accessibility: User needs – Space for Small Island Developing States (SIDS)".

During the session, UNOOSA outlined the development of the Pacific project and the potential ways forward (phase 2 of the project), seeking to raise awareness about the work done in the region with the support of New Zealand and alert potentially interested parties to the opportunity to participate in and contribute to the project.

Furthermore, during the Symposium, a representative of SPC also presented the situation in the region with regard to access to space technologies, focusing on vegetation monitoring. The SPC representative's participation in the session and the Symposium was facilitated and funded by the UNOOSA fellowship programme, in order to contribute to the promotion of the "Space Solutions for the Pacific" project in terms of the development of partnerships and further engagement of the Office with stakeholders in the region.

#### The International Charter "Space and Major Disasters"

The Charter, an initiative from the UNISPACE III conference held in Vienna (1999), facilitates the acquisition of high-resolution satellite data to support relief and emergency response activities in the event of major disasters.

UNOOSA both assists governments that are not in a position to trigger requests for the Charter to be activated and also support entities in the process of becoming authorized users themselves. Typically consisting of representatives of national civil protection, rescue or security organizations, authorized users submit requests to mobilize the space and associated ground resources associated with Charter members in order to obtain data and information on a major disaster. Authorized users are the only bodies allowed to directly request an activation of the Charter. They may also request support on behalf of other users with whom they cooperate for relief purposes, as is the case of UNOOSA in its work with Member States who have not yet achieved authorized user status.



#### Proposed space solutions: disaster risk reduction

The United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), implemented by UNOOSA, aims at providing universal access to all types of space-based information and services relevant to disaster management: as a gateway to space-based information for disaster management support; as a bridge to connect the disaster management and space communities; and aa facilitator of capacity-building and institutional strengthening.

One of the core activities of UN-SPIDER is to provide technical advisory support to countries, including carrying out technical advisory missions to meet with key Government institutions (including the leading national disaster management organizations), United Nations agencies, regional and international organizations/initiatives and private enterprise to discuss the topic and put forward recommendations and guidelines to improve the access to and use of space-based information in disaster management.

Since its inception, UN-SPIDER, has focused on disaster risk reduction and emergency response in order to enhance the capabilities of PICs in reducing vulnerability to hazards. It contributed to the "Hyogo Framework for Action 2005: Building the Resilience of Nations and Communities to Disasters" by engaging with the national disaster management agencies of the Member States and with partners such as the United Nations Office for Disaster Risk Reduction.

Since the adoption of the Sendai Framework for Disaster Risk Reduction 2015-2030, UN-SPIDER has implemented concrete actions to support the implementation efforts of Sendai in collaboration with its network and in partnership with Member States, retaining national disaster management agencies as focal points. The "Disaster Resilience for Sustainable Development, Asia-Pacific Disaster Report 2019" of the United Nations Economic and Social Commission for Asia and the Pacific indicates that:

- Over the period 2010–2019, the Pacific subregion reported over 16,000 fatalities from various hazards, including tropical cyclones, earthquakes, floods, and extreme temperatures. Among the most damaging were tropical cyclones which affected over 1.2 million people with over \$10 billion estimated damage. Earthquakes and floods had considerable impacts. Except for New Zealand and Australia, countries in the Pacific subregion recorded significantly higher average damage per year between 2010 and 2019 as a percentage of GDP than countries in other subregions.
- Countries in the Pacific are also particularly at risk from the impacts of climate change, including sea-level rise. Losses from natural disasters vary considerably within countries, with different areas having differing degrees of exposure and vulnerability to natural hazards: some areas may be well equipped while others struggle to cope. National policies thus need to take these differences in exposure, vulnerability and coping capacities into account.

Through UN-SPIDER, UNOOSA proposes structured assistance for preparedness and emergency response by enabling capacity and access to space-based systems and interoperability with ground/in situ systems. It contributes specifically to priority 4 of the Sendai Framework – Enhancing disaster preparedness for effective response and to the "Build Back Better" approach to recovery, rehabilitation and reconstruction. It also enhances the combined use of Earth observation, global navigation satellite systems and telecommunication constellations in single and multi-hazard early warning systems.

The activities typically carried out in a technical advisory mission include:

- Assessing national capacity and evaluating disaster and risk reduction activities, policies and plans with regard to the use of space-based technologies
- Assisting in the definition of risk and disaster management plans and policies with regard to the use of space-based technologies
- Developing and customizing guidelines and templates for including space-based technologies in disaster risk reduction and emergency response
- Facilitating access of national institutions to space-based information to support disaster risk reduction and emergency response activities
- Identifying training needs and facilitating the implementation of capacity-building activities
- Supporting the implementation of risk reduction and emergency response activities using space-based technologies

Working in collaboration with UNDP and other United Nations entities operating in the disaster risk reduction field, UN-SPIDER technical advisory missions offer Pacific National Disaster Management Authorities the opportunity to:

- Link national disaster management authorities with the geospatial community within the Pacific
- Share data (with a focus on geospatial data, more specifically space-based information) within institutions to benefit the disaster management community
- Contribute to the disaster management plans and policies to help emphasize the use of space-based information at all stages of disaster management
- Access satellite-based information and solutions during emergency response
- Strengthen participation in existing networks and the various virtual and technical communities

#### Proposed space solutions: coastal habitat protection and management

The management of coastal habitats is a second priority identified by UNOOSA in its initial needs assessment of space-based solutions in the Pacific. This includes, but is not limited to, coastal environment management, coastal and marine protected areas, fish stock management, coastal erosion, coastal resource extraction and other activities such as tourism infrastructure development. The relationship between coastal habitat conservation and commercial fishing activities is important at various levels: fish stocks, protection of spawning areas, livelihood preservation and population vulnerabilities.

Proposed future activities would initiate the assessment and design of appropriate space-based solutions for the issues listed above, including an Earth observation-based mapping of the main vulnerable coastlines of the three countries where technical advisory missions will be carried out. Such mapping exercises can be designed in a way as to facilitate use by national stakeholders beyond the context of coastal habitat protection.

The Earth observation-based mapping would be done through a UNOOSA partnership arrangement using local/regional technical expertise in remote sensing, geographic information systems and data visualization, alongside partners such as SPC.

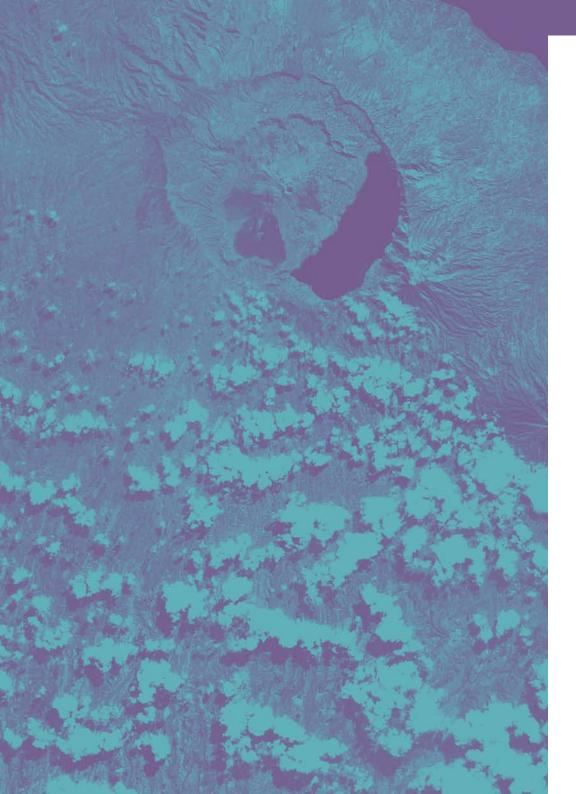
Based on the preliminary study conducted in November 2018, during the SPC Geospatial Information Systems and Remote Sensing annual conference, the project will further explore the key stakeholders (individuals and groups) that are involved in the policy and decision-making processes on coastal habitat protection and management at national and regional levels. Apart from governmental entities, non-governmental actors and international organizations, particularly United Nations entities active in the area, will be identified and contacted.

Once the key actors have been identified, their priorities and needs regarding the issue of coastal habitat protection and management will be assessed with the use of available tools, including but not limited to the existing survey on user needs in the Pacific region, interviews and desk research.

Since a range of United Nations entities are active in the region, particularly in the priority areas, the project emphasizes the importance of developing an inclusive strategy to involve interested parties and avoid duplication. Locally active United Nations entities would be engaged through existing networks, and channels of communication and liaison would be established to maximize impact while limiting regional project implementation fatigue.

Similarly, working through the network of SPC and the Pacific Islands Forum, the proposed space solution activity would identify and engage with non-United Nations entities operating within the scope of the thematic priorities, to ensure a diversity of actors. In summary, the main areas of focus proposed for maximum benefit to PIC users are:

- Regional consultation on risk and vulnerability
- Earth observation mapping of vulnerabilities
- A project document on space-based solutions for PIC coastal vulnerabilities
- A special assessment of linkages to illegal, unregulated and unreported fishing activities. A case study can be developed to identify the potential for the focused use of space technologies, particularly Earth observation, for monitoring and enforcing regulations regarding illegal and destructive fishing activities in the region



# CONCLUSION

The "Space Solutions for the Pacific" project showcases the wide-spread interest and investment – at both the national and regional levels – in the use of space-based technology and data to accelerate sustainable development in the Pacific. Activities undertaken in the region by UNOOSA in the past continue to be held in high regard by national representatives involved in these projects. Some of the recommendations proposed during previous UN-SPIDER technical advisory missions remain relevant to national efforts to implement the use of space-based tools and information in the field of disaster risk reduction and emergency response.

Engagement with Pacific partners also raised a wide range of additional policy areas, beyond disaster risk reduction, on which PICs are placing increasing attention at the national and regional level from a space perspective. It is clear that the landscape of national ministries and related stakeholders who are seeking to increase their use of space-based tools and information is growing rapidly.

The project facilitated lasting step changes in the institutional links between UNOOSA, SPC and United Nations entities with a field presence in the Pacific, including UNDP. These are relationships that UNOOSA will continue to build upon going forward. Such links have delivered a number of returns during the project time frame, including cooperation on the delivery of a UNOOSA GNSS workshop in Suva and enhanced Pacific representation, through SPC, at both the 2019 COPUOS session and the 2019 Austria/United Nations Graz Space Symposium. A formal partnership agreement with SPC is under current negotiation as part of ongoing interest from UNOOSA in strengthening links, programmatic activities and service provision for PICs and the Pacific-based organizations.

# THE UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS (UNOOSA)

IS RESPONSIBLE FOR ADVANCING INTERNATIONAL COOPERATION IN THE PEACEFUL USES OF OUTER SPACE AND HELPS ALL COUNTRIES USE SPACE SCIENCE AND TECHNOLOGY TO ACHIEVE SUSTAINABLE DEVELOPMENT.

