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NEWSLETTER

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In Focus

UNISPACE+50 Thematic Priority 6: International cooperation towards low-emission and resilient societies

Member States of the United Nations are engaged with and act upon three important global frameworks: the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction 2015-2030 and the Paris Agreement stemming from the 21st meeting of the Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change. Alongside these endeavours, the United Nations Office for Outer Space Affairs (UNOOSA) is preparing for UNISPACE+50, which will mark in 2018 the 50th anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE I), held in 1968 in Vienna.

The Committee on the Peaceful Uses of Outer Space (COPUOS) at its fifty-eighth session in June 2015 endorsed a plan of work heading towards UNISPACE+50. In line with the 2030 Agenda for Sustainable Development and the Sustainable Development Goals, UNISPACE+50 aims to chart the future role of COPUOS, its subsidiary bodies and UNOOSA. At UNISPACE+50, the international community will develop a global vision for the future of international space cooperation called Space2030, based on the four pillars of space economy, space society, space accessibility and space diplomacy.

Acquired on 15 March 2017, this subset from the first image from the Sentinel-2B satellite features the Italian port city of Brindisi. Image: ESA (CC BY-SA 3.0 IGO).

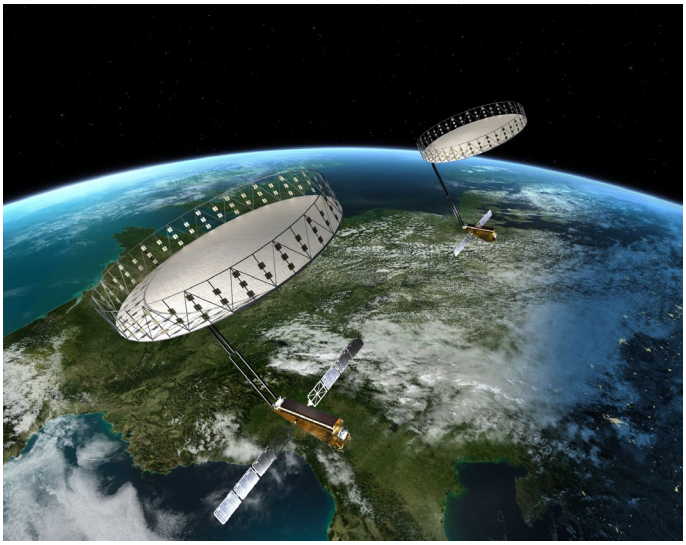
In preparation for UNISPACE+50, COPUOS endorsed seven thematic priorities. Thematic Priority 6 (TP6), "International Cooperation Towards Low-Emission and Resilient Societies", is closely linked to UN-SPIDER, the UNOOSA programme to develop solutions to address the limited access developing countries have to space and related technologies that can be essential in the management of disasters and disaster risk reduction. TP6 focuses on disaster risk reduction, climate change mitigation and adaptation, the 2030 Agenda for Sustainable Development and space infrastructure resiliency. These components will be addressed through a dedicated TP6 road map.

The specific activities organized to progress on TP6 are:

- UN-SPIDER activities such as Technical Advisory Missions (TAM), capacity-building programmes, institutional strengthening missions and expert meetings
- United Nations International Conference on Space-based Technologies for Disaster Risk Reduction - "Building Resilience through Integrated Applications", Beijing, China, 23-25 October 2017
- International Asteroid Warning Network (IAWN) and Space Mission Planning Advisory Group (SMPAG), COP23 – Bonn, Germany, 6-17 November 2017
- UN/Germany International Conference on International Cooperation Towards Low-Emission and Resilient Societies, Bonn, 22-24 November 2017

In this issue

Synergies between climate change, disaster risk reduction and sustainable development efforts



The Tandem-L satellites with large unfurlable reflector antennas in formation flight. Image: DLR.

Satellite remote sensing is enabling researchers and practitioners to improve their understanding of the Earth system. The increasing number of satellites placed in orbit in recent years and their improved characteristics are allowing for shorter re-visit times, increased spatial resolution and tailored observations of selected processes through improved multi-spectral capacities. As such, satellites can enhance the ability of government agencies and the international community to contribute to the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030, the Paris Agreement and the Sustainable Development Goals (SDGs).

The Paris Agreement requires strong efforts in mitigation and adaptation to the different types of manifestations of climate change worldwide, now and in the next decades. Efforts in disaster risk reduction, as stipulated by the Sendai Framework, start with an improved understanding of risks related to natural hazards as the way to identify and implement measures to reduce such risks and to avoid their generation in decades to come. The fact that climate change is modifying the temporal and spatial characteristics of natural hazards creates opportunities for synergies between the two agendas. Both agendas are an integral part of the SDGs. Hence, integrated approaches and multi-stakeholder cooperation will improve outcomes for both disaster risk reduction and climate change, and contribute to sustainable development.

Space-based technologies and applications can contribute to systematically monitoring disaster and climate risk elements. The multifaceted causes and impacts of natural hazards such as droughts on different sectors, with manifold cascading effects such as food insecurity, migration, energy generation and land degradation, constitute an example of the use of Earth observation to contribute to an improved understanding of drought risk as a prerequisite of disaster risk reduction and management.

Research and technological developments in sensors in satellites and new satellite constellations will allow stakeholders to reduce existing data and information gaps for Earth system understanding and contributing to the requirements of the 2030 Agenda for Sustainable Development. One representative example is the Tandem-L concept. It is a proposal for an innovative satellite mission for the global observation of dynamic processes on the Earth's surface. It will provide required information for solving scientific questions in the areas of the biosphere, geosphere, cryosphere and hydrosphere and contribute to an improved understanding of the Earth system and its dynamics.

Examples of dynamic processes within the bio-, geo-, cryo- and hydrosphere that Tandem-L will deliver information for and the observation intervals required for their systematic monitoring. Figure: DLR.

Intregrated space applications approaches and the interoperability of space-based and ground/in situ systems

For a long time, early warning systems established for tropical storms, typhoons and hurricanes have benefited from the use of Earth observation satellites. Initially, satellites allowed meteorologists to track their paths across seas and oceans. Currently, such satellites are allowing meteorologists to keep track of their paths more precisely and to gather additional data on a variety of parameters as a way to improve forecasts related to such events and bad weather at sea and on land.

With the use of satellite telecommunications in ground instruments deployed to monitor phenomena such as volcanic and seismic activity in remote areas, forecasters working in early warning systems have been able to compile more precise data on the spatial and temporal characteristics of natural hazards. This has improved the understanding of phenomena capable of triggering disasters, including volcanic eruptions, tsunamis, floods and, in selected cases, even earthquakes.

Furthermore, the incorporation of the use of global navigation satellite systems is allowing seismologists to track the relative motion of tectonic plates and the magnitude of earthquakes of extremely large magnitude.

Recognizing their usefulness, the Sendai Framework for Disaster Risk Reduction 2015-2030 calls for the implementation of multi-hazard early warning systems. Similarly, the Paris Agreement calls for the implementation of early warning systems as a way to adapt to the changing nature of hydro-meteorological losses and to reduce their impacts on vulnerable societies.

One way in which these systems will be improved in the coming years will be to expand warning messages from impending hazards to potential impacts. This can be achieved through the combined use of satellite technologies and in situ data and will lead to more effective early warning in the context of disaster risk reduction efforts and climate change adaptation. This aspect of Thematic Priority 6 was also discussed at the United Nations International Conference on Space-Based Technologies for Disaster Risk Reduction “Integrated Applications for Building Resilience” in Beijing, China, from 23 to 25 October 2017.

The Sendai Framework promotes the integrated use of space-based and in situ information under its first priority of action: “Improved understanding of disaster risk in all its dimensions of exposure, vulnerability and hazard characteristics”. It envisions efforts to enhance, through international cooperation, including technology transfer, access to and the sharing and use of non-sensitive data and information. This includes communications, geospatial and space-based technologies and related services.

The space community has already introduced open data policies to allow stakeholders to access satellite imagery free of charge. The combination of space-based and in situ information on the temporal and spatial extent of an impending hazard, the exposure of vulnerable elements and their degree of vulnerability will allow for improved forecasts of potential impacts and provide an up-to-date view of the level of risk.

United Nations International Conference on Space-based Technologies for Disaster Risk Reduction, Beijing, 23-25 October 2017. Image: UNOOSA.

These improvements will allow civil protection agencies and vulnerable communities to take early action as a way to minimize the impacts of impending hazards, leading not only to a reduction in the loss of lives or in the number of people injured, but also in the loss of assets essential for livelihoods. Through the use of archived and up-to-date satellite imagery, they will also be able to track the evolution of exposure in recent decades and use this information to design improved land-use policies that inhibit the establishment of new elements such as urban settlements in high-hazard areas.

Similar efforts are envisioned in the context of climate change, where scientists will use data from many sources as a way to improve the forecast of hydro-meteorological hazards affected by climate change. The data will also improve the forecasts of cascading events such as storm surges on the basis of knowledge of the ways in which tropical storms, typhoons and hurricanes trigger such storm surges when considering sea-level rise in specific regions of the world.

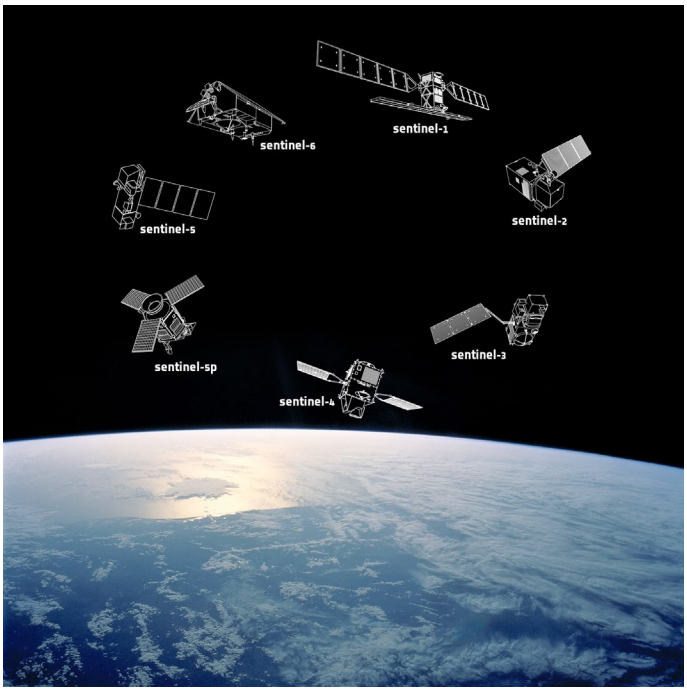
Thematic Priority 6 of the UNISPACE+50 process considers the combined use of space-based and in situ data as well as the affiliation of existing and future Earth observation, global navigation satellite system and telecommunications constellations as a way to enhance the resilience of societies to natural hazards and climate change, and to contribute to sustainable development worldwide.

Affiliation of existing and future satellite constellations for disaster risk reduction and climate change monitoring and mitigation

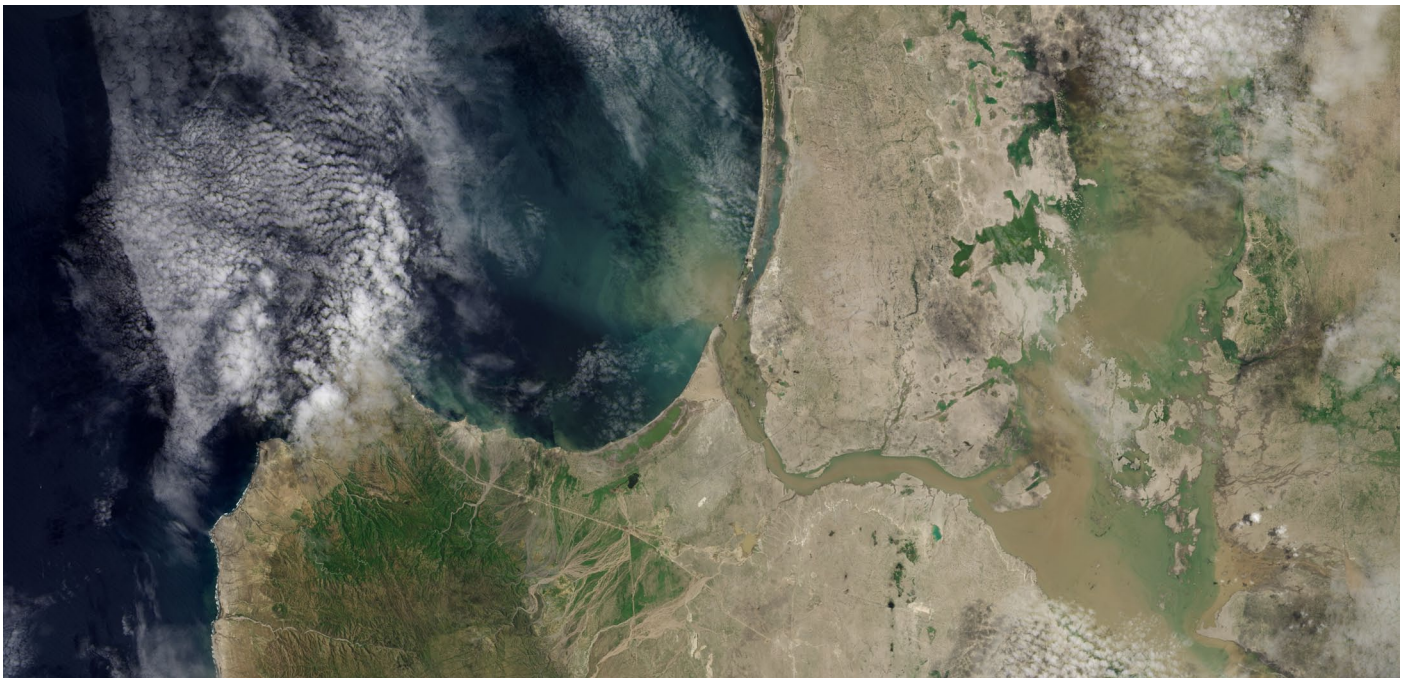
Space-based information can play an important role in supporting governments to assess, monitor and evaluate progress in implementing the 2030 Agenda for Sustainable Development. But the long-term domain of the 2030 Agenda for Sustainable Development and the even longer timeframe of the Paris Agreement will demand innovative solutions from the space community. Constellations of satellites to be used to contribute to the monitoring of these global agendas will demand the provision of consistent, reliable and accessible data over long time periods.

In a similar fashion, satellite data will find its application in these agendas so long as access to such data is open. This requires the implementation of open data policies.

One relevant example to highlight in this respect is Copernicus, a European Union Programme aimed at developing European information services based on satellite Earth observation and in situ data. Vast amounts of global data from satellites and from ground-based, airborne and seaborne measurement systems are being used to provide information to help service providers, public authorities and other international organizations improve the quality of life for the citizens of Europe. The information services provided are freely and openly accessible to its users. Copernicus has been specifically designed to meet user requirements. Through satellite and in situ observations, the services deliver near-real-time data on a global level, which can also be used for local and regional needs, to help us better understand our planet and sustainably manage the environment we live in. Copernicus is served by a set of dedicated satellites, the Sentinel satellite missions, as well as by existing commercial and public satellites. The Copernicus services transform this wealth of satellite and in situ data into value-added information by processing the data. Datasets spanning decades will be comparable and searchable, thus ensuring the monitoring of changes, and an improved understanding of the oceans and the atmosphere.



The six different Sentinel missions supply a stream of complementary imagery and data tailored to the needs of Europe's environmental monitoring Copernicus programme. Image: ESA.



Several weeks of intense rain have triggered severe floods and mudslides in Peru. On April 4, 2017, the Operational Land Imager (OLI) on Landsat 8 captured this image of flood waters near the town of Parachique. Image: NASA.

Overview of UNISPACE+50 Thematic Priorities

Global partnership in space exploration and innovation

Raise awareness of space exploration and innovation as essential drivers for opening up new domains in space science and technology, triggering new partnerships and developing capabilities that create new opportunities for addressing global challenges. Foster dialogue with the space industry and the private sector. Promote cooperation between spacefaring nations and emerging space nations. Allow space exploration activities to become open and inclusive on a global scale. Identify governance and cooperation mechanisms to support this objective.

Legal regime of outer space and global space governance: current and future perspectives

Promote the universality of the five United Nations treaties on outer space. Assess the state of affairs of those treaties and their relationship with other relevant international instruments, such as principles, resolutions and guidelines governing space activities. Analyze the effectiveness of the legal regime of outer space in the twenty-first century, with a view to identifying areas that may require additional regulation.

Enhanced information exchange on space objects and events

Define and develop requirements for enhanced information exchange and notification procedures under the United Nations Register of Objects Launched into Outer Space, taking into account the recommendations contained in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/68/189) and the future guidelines for the long-term sustainability of outer space activities specifically addressing risk-reduction notification needs. Identify cooperation mechanisms to support this objective. Encourage capacity-building and outreach activities on transparency and confidence-building measures.

International framework for space weather services

Strengthen the reliability of space systems and their ability to respond to the impact of adverse space weather. Develop a space weather road map for international coordination and information exchange on space weather events and their mitigation, through risk analysis and assessment of user needs. Recognize space weather as a global challenge and the need to address the vulnerability of society as a whole. Increase awareness through developed communication, capacity-building and outreach. Identify governance and cooperation mechanisms to support this objective.

Strengthened space cooperation for global health

Improve the use of space technologies and space-based information and systems in the global health domain. Promote enhanced cooperation and sharing of information in emergencies, epidemics and early warning events, as well as on environmental parameters. Enhance capability in integrating health data in disaster management plans. Strengthen capacity-building in advancing space technologies in global health efforts. Identify governance and cooperation mechanisms to support this objective.

International cooperation towards low-emission and resilient societies

Define synergies between climate change mitigation efforts, disaster risk reduction and global development and reducing emissions by replacing carbon energy with renewable energy. Develop a road map for enhanced resiliency of space-based systems and the affiliation of existing and future Earth observation, global navigation satellite system and telecommunication constellations for disaster risk reduction and climate change monitoring and mitigation. Improve integrated space applications approaches and the interoperability of space-based systems and ground/in situ systems. Provide requirements to new developers for coverage in geographical areas not sufficiently monitored or applications that need further development. Identify governance and cooperation mechanisms to support this objective.

Capacity-building for the twenty-first century

Define new innovative and effective approaches to overall capacity-building and development needs as a fundamental pillar of global space governance. Strengthen comprehensive capacity-building and outreach activities of the Office for Outer Space Affairs. Develop infrastructure for cross-sectoral and integrated applications, with combined scientific, technical, legal and policy outputs. Enhance existing partnerships and forge new ones to strengthen and deliver targeted capacity-building and technical advisory activities based on needs assessments. Promote efforts to encourage science, technology, engineering and mathematics education, especially for women in developing countries.

Editorial

UNISPACE+50: Towards a Space2030 vision

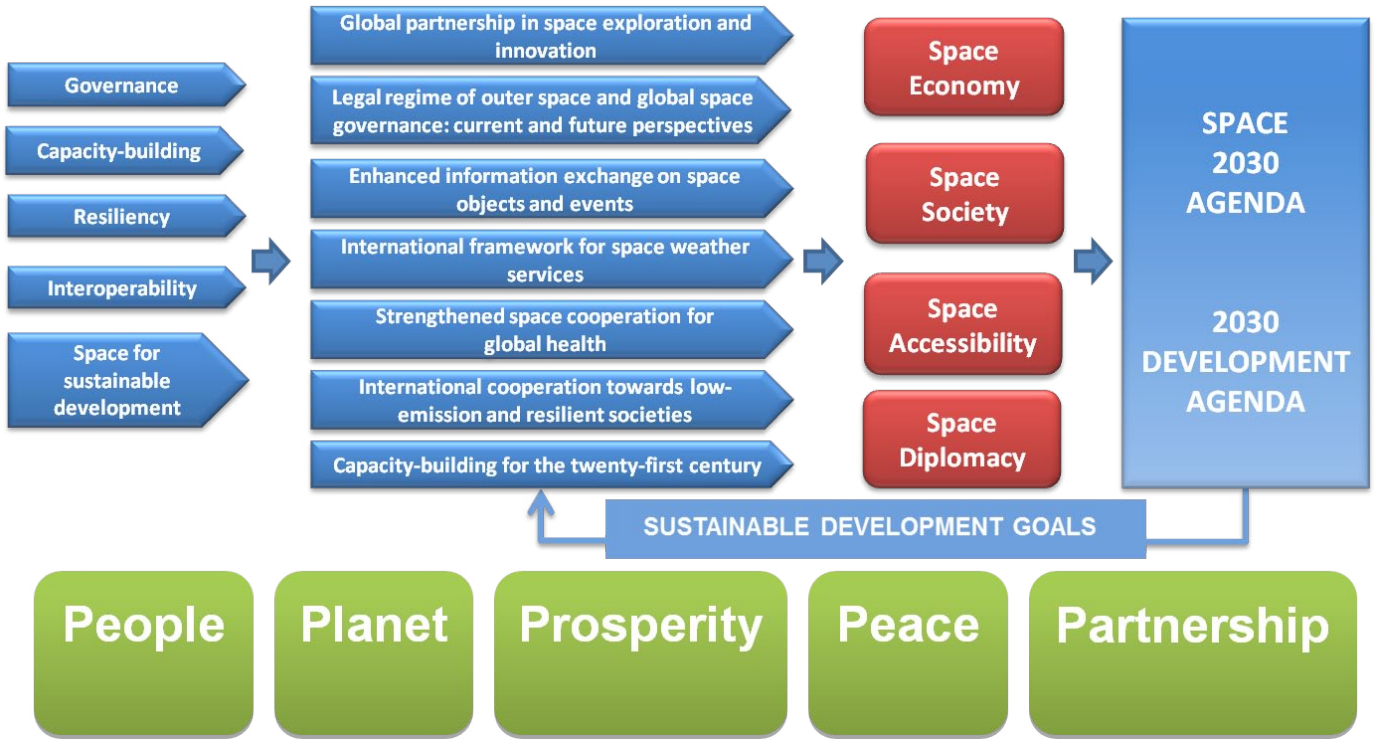
by Simonetta Di Pippo, Director of the United Nations Office for Outer Space Affairs (UNOOSA)

The United Nations/Germany International Conference on "International Cooperation Towards Low-Emission and Resilient Societies" is the culmination of a two-year-long process that the UN-SPIDER programme and the Programme on Space Applications of the United Nations Office for Outer Space Affairs (UNOOSA) conducted in 2016 and 2017. The aim has been to compile policy-relevant recommendations on ways to enhance the combined and complementary use of Earth observation, global navigation satellite systems, telecommunication constellations and ground-based systems to generate precise geospatial information.

As the flagship event of Thematic Priority 6 of the UNISPACE+50 process, this International Conference has also been used to address ways in which existing and future constellations of satellites can be employed to contribute to the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030, the Sustainable Development Goals (SDGs) and the Paris Agreement.

The UNISPACE+50 process takes into account the interdependencies in the space sector and fosters international cooperation, while paying special attention to the needs of developing countries and emerging spacefaring nations and carefully considering the long-term sustainability of outer space activities leading towards 2030. The main outcome of the UNISPACE+50 process will be the Space2030 vision, which will be structured around the key pillars of space economy, space society, space accessibility and space diplomacy. Space2030 will also have a plan for implementation of key decisions and actions resulting from the UNISPACE+50 process and defined under the strategic objectives of the Space2030 agenda for strengthened cooperation and governance of outer space activities.

Shaped in this manner, the Space2030 vision will chart the future role of the Committee, its subsidiary bodies and UNOOSA in the area of global governance of space activities. It will outline ways and means for strengthening their role within the United Nations system and the global space community at a time when the space agenda is becoming increasingly complex and more actors, both governmental and non-governmental, are involved in ventures to explore space and carry out space activities. It will define the ways in which international cooperation on the peaceful uses of outer space will contribute to the benefit of humankind in years to come.



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The United Nations Office for Outer Space Affairs (OOSA) implements the decisions of the General Assembly and of the Committee on the Peaceful Uses of Outer Space and its two Subcommittees, the Scientific and Technical Subcommittee and the Legal Subcommittee. The Office is responsible for promoting international cooperation in the peaceful uses of outer space, and assisting developing countries in using space science and technology. In resolution 61/110 of 14 December 2006 the United Nations General Assembly agreed to establish the "United Nations Platform for Space-based Information for Disaster Management and Emergency Response - UN-SPIDER" as a new United Nations programme to be implemented by OOSA. UN-SPIDER is the first programme of its kind to focus on the need to ensure access to and use of space-based solutions during all phases of the disaster management cycle, including the risk reduction phase which will significantly contribute to the reduction in the loss of lives and property. UN-SPIDER Newsletter, Volume 2/17, November 2017.