



# General Assembly

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## Committee on the Peaceful Uses of Outer Space

### Report on the United Nations/Austria Symposium on Space Applications for Sustainable Development Goal 13: Climate Action

(Graz, Austria (online), 1–3 September 2020)

#### I. Introduction

1. The Office for Outer Space Affairs of the Secretariat and the Government of Austria jointly organized a symposium on the theme “Space applications for Sustainable Development Goal 13: climate action”. The event was aimed at presenting examples of concrete climate action through demonstrations of applications that use space solutions. It offered attendees – in particular, representatives of developing countries – an opportunity to explore tools, policies and approaches that could be adopted according to the regional, national or local context. Users of space applications were invited to present lessons learned and experts to discuss the role of space applications in climate-related policies.
2. The United Nations/Austria symposium is one of the long-standing activities of the Office for Outer Space Affairs under the United Nations Programme on Space Applications. The symposium of 2020 was the twenty-sixth in the series.
3. Owing to the coronavirus disease (COVID-19) pandemic, the symposium, originally scheduled to take place in Graz, Austria, was held online from 1 to 3 September 2020. The event was co-organized by the Government of Austria and supported by Joanneum Research as local organizer, in cooperation with Graz University of Technology. It was co-sponsored by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, the City of Graz and Austrospace. The Federal Ministry for European and International Affairs and the National Point of Contact for Space Law Austria at the University of Vienna also provided support.
4. The present report describes the objectives of the symposium, provides details of attendance, summarizes the activities carried out and highlights the lessons learned for future symposiums.

#### II. Background and objectives

5. The Office for Outer Space Affairs disseminates knowledge with respect to the added value of space applications in addressing societal issues, notably through



events of the Programme on Space Applications held at the request of Member States and organized jointly.

6. Since 1994, the United Nations/Austria symposium has focused on innovative ways of responding to societal needs and has showcased the socioeconomic benefits of space applications in a wide range of areas. Since 2017, the symposium has also combined space policy and legal aspects with space technology, services and applications in a holistic manner.

7. The symposium had the following objectives:

(a) To foster the exchange of best practices in the use of space applications for specific climate change mitigation and/or climate-related adaptation activities;

(b) To share expertise and explore what services are available, demonstrating how those services can be accessed and used to support climate action according to national priorities;

(c) To showcase available toolboxes already implemented as part of case studies or pilot projects with the aim of promoting the adoption of tested tools and approaches;

(d) To discuss the role of the Office for Outer Space Affairs in implementing capacity-building activities, particularly in developing countries;

(e) To raise awareness among the various user groups – in particular, the United Nations and other international organizations, non-governmental organizations and the diplomatic community – with regard to existing space-related activities, services and cooperation programmes;

(f) To showcase how space-related policies have been developed and how they are implemented in different countries;

(g) To discuss how international climate-related regulations, such as the “nationally determined contributions” requirement under the Paris Agreement, can be fulfilled through the use of space technologies and applications.

8. The change of the symposium format to an online event entailed the establishment of additional objectives in terms of logistics, including enabling participant interaction, ensuring that time differences and limited Internet bandwidth would not hinder access to information and also ensuring engaging content and lively exchanges despite the lack of face-to-face interaction.

### **III. Attendance**

9. A total of 338 individuals, 42 per cent of whom were women, registered to attend the symposium and were granted access to the web-based communication platform.

10. A number of participants were members of the diplomatic community, including representatives of permanent missions to the United Nations at Vienna. Representatives of space agencies – including the Algerian Space Agency, the Austrian Research Promotion Agency, the Brazilian Space Agency, the Canadian Space Agency, the Egyptian Space Agency, the European Space Agency, the Ethiopian Space Science and Technology Institute, the National Centre for Space Studies of France, the German Aerospace Center, the Iranian Space Research Centre, the Italian Space Agency, the National Aeronautics and Space Administration of the United States of America, the National Institute of Aeronautics and Space of Indonesia, the National Space Research and Development Agency of Nigeria, the Netherlands Space Office, the Norwegian Space Agency, the Royal Centre for Remote Sensing of Morocco, the Mexican Space Agency and the Swedish National Space Agency – were also present.

11. The following 77 countries were represented: Algeria, Angola, Argentina, Armenia, Australia, Austria, Bangladesh, Belgium, Benin, Bolivia (Plurinational

State of), Bosnia and Herzegovina, Brazil, Bulgaria, Burundi, Cameroon, Canada, Central African Republic, Colombia, Costa Rica, Croatia, Cuba, Czechia, Denmark, Ecuador, Egypt, Ethiopia, Finland, France, Gabon, Germany, Ghana, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Ireland, Israel, Italy, Jamaica, Japan, Kazakhstan, Kenya, Kuwait, Lao People's Democratic Republic, Luxembourg, Malaysia, Mauritania, Mexico, Mongolia, Morocco, Nepal, Netherlands, Niger, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Senegal, Singapore, Spain, Sweden, Switzerland, Thailand, Togo, Turkey, United Kingdom of Great Britain and Northern Ireland, United Republic of Tanzania, United States of America, Venezuela (Bolivarian Republic of) and Yemen.

12. Attendees who explicitly granted their consent were included in a written list circulated to all others for information before the event began.

#### IV. Programme

13. The programme was structured according to four types of intervention:

- (a) Keynote speeches;
- (b) Panel discussions;
- (c) Presentation sessions led by four or five successive speakers, followed by a question-and-answer discussion;
- (d) Succinct “project pitch” presentations, each lasting three minutes.

14. Use of the “project pitch” format, intended as the online equivalent of a poster session, made it possible to increase the number of initiatives presented and enabled less experienced speakers to give presentations.

15. In total, the event lasted for 14 hours and included 48 speakers comprising equal numbers of women and men.

16. All presentations given by the speakers were made available on the website of the Office for Outer Space Affairs before the event began to enable attendees who might have technical difficulties during the event owing to limited bandwidth to download the content in advance at [www.unoosa.org/oosa/en/ourwork/psa/schedule/2020/2020Graz.html](http://www.unoosa.org/oosa/en/ourwork/psa/schedule/2020/2020Graz.html).

17. The event began with a welcome ceremony during which Austrian authorities, co-organizers and sponsors provided their insights on the theme of the symposium and the Office for Outer Space Affairs explained the specificities of the event. The ceremony included live music from an award-winning accordion player, broadcast from Graz, to add a measure of local culture to the symposium.

18. In a keynote speech, the Director of Earth Observation Programmes at the European Space Agency presented achievements and challenges in Earth observation for climate monitoring, drawing attention to the status of existing Earth observation resources and explaining how the contributions made by those resources were critical to the achievement of Sustainable Development Goal 13.

19. Session 1, on climate action, provided an overview of the situation from the perspective of the United Nations Framework Convention on Climate Change. Briefings on the activities of space agencies that are members of Eurisy and the national space entities of Brazil and Indonesia detailed concrete cases in which space-based solutions had been implemented in support of Sustainable Development Goal 13. Speakers presented the tools already available and those found most effective, from the global level to the local level, and explained the mechanisms, initiatives, processes and partnerships through which international governance in relation to Earth observation services contributed to climate action. They provided examples of services accessible to end-users globally and highlighted how some Governments were making inclusive access to space-based data and solutions a reality.

20. Panel 1, on general principles of international environmental law and space activities, addressed the extent of interaction between space law and international law in the area of environmental protection. The presentations showed that both areas of law are characterized by a considerable degree of vagueness, and the panel stressed that States should commit to more ambitious goals in order to protect the Earth and the space environment while combating climate change through, inter alia, regulatory frameworks at the international, regional and national levels. The panel recommended that verification and compliance mechanisms be strengthened, noting that space technology could provide useful assistance in that regard.

21. Session 2, on energy and natural resources, focused on the relationships between the space sector and other sectors and the importance of understanding and monitoring economic activities in order to mitigate the impact of those activities on climate change. Speakers presented examples of detection and monitoring programmes that had enabled the identification of sources of pollutants and greenhouse gases – methane in particular – and possible areas in which rare minerals needed for renewable energy technology could be extracted, such initiatives fostering collaboration between public entities and industries. Local applications of Earth observation data had also proved valuable in helping to achieve equitable solutions to conflicts relating to resource or land use.

22. A keynote speech on the She Space international initiative for high-school girls was delivered by a representative of Ben-Gurion University. She Space is aimed at countering the tendency among many young women to give up on education in, or a career in, science, technology, engineering or mathematics at an early stage, even before starting university. Girls involved in the initiative learn how to use space applications to tackle climate change and later have the opportunity to become ambassadors, giving talks at other schools and motivating young people to study space science and technology.

23. Session 3, on agriculture and forestry, illustrated concrete uses of satellite applications in monitoring agriculture and evaluating the risk of crop failure and desertification and drew attention to integrated tools for improving the economic and environmental performance of farms. Specific information was provided on space-based tools for monitoring forest ecosystems and their health. All of the activities presented were aimed at making agriculture sustainable and efficient in order to mitigate its impact on the climate while at the same time increasing the resilience of agricultural practices to the impact of climate change. It was explained that while Earth observation was used in all such activities, the benefits of global navigation satellite systems were also – and increasingly – being exploited. Speakers provided information on the latest developments with respect to satellites and sensors and on the potential of open tools and data and explained how the integration of space-based applications with other tools made combined solutions more effective for Governments, businesses and communities.

24. Session 4 focused on urban planning and disaster management. The representative of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) highlighted the importance of satellite applications for managing disasters, which were becoming increasingly frequent and severe. The session demonstrated that satellite applications are essential for damage assessments after the occurrence of natural disasters. They are also key to prevention and preparedness – for example, as part of urban planning to prevent flood damage or coastal protection against erosion. Global monitoring services using satellite images are maturing and are gradually becoming operational, providing accurate and timely assessments of the extent of floods at global, national and local levels. In addition to the use of large volumes of time-series data in so-called data cubes, information from satellites is also combined with other big data obtained from social media and socioeconomic indicators to generate real-time maps and predictive analytics.

25. In her keynote speech, the Director of the Office for Outer Space Affairs presented the current status of international space-sector cooperation that is relevant to Sustainable Development Goal 13 and spoke about how partnerships are put into action. Drawing a parallel between the global actions taken to combat the COVID-19 pandemic and the urgency of action to mitigate and adapt to the effects of climate change, she highlighted the importance of immediate action and the involvement of all. To that end, she announced the preparation by the Office of a new “Space for Climate Action” initiative, the main objective of which would be to ensure that all countries, especially developing countries, have access to information and can develop their capacity to use space-based technologies to address the most critical challenges facing the world.

26. Panel 2, on international cooperation and best practices for climate action, brought together a wide range of stakeholders committed to taking action, including representatives of intergovernmental and non-governmental organizations, Governments, space agencies and the space industry. All agreed that in order to coordinate global climate actions, it was essential that there should be a common understanding of the causes, effects and evolution of climate change. The panel reviewed various international collaboration activities and best practices aimed at supporting global climate action, taking concrete measures and acting in synergy. Participants described current activities to ensure the coherent implementation of the Paris Agreement and the 2030 Agenda for Sustainable Development by maximizing sustainable development and related climate benefits. It was noted that while the scientific community and the United Nations had long recognized that space-based technologies were essential components of climate change research, monitoring and policy enactment, the capabilities of space-based technologies and information were still underused in addressing climate change. Participants discussed what specific steps were required and what role the Office for Outer Space Affairs might take.

27. Between the sessions and panels, a total of five “project pitch” presentations provided a brief introduction to innovative projects in various regions of the world.

28. Attendees were encouraged to submit questions to speakers in writing through the online communication platform throughout the event and some attendees used that function to highlight relevant initiatives in their own regions. Dedicated moderators conveyed questions to speakers, providing immediate feedback on how presentations were received and seeking clarifications when requested to do so.

29. The Office for Outer Space Affairs and the Austrian co-organizers concluded the symposium by providing a summary of what had been presented and an overview of attendance and of the respective roles played by those involved in organizing the event. Participants were encouraged to provide written feedback using a dedicated online form.

## V. Observations and recommendations

30. The symposium recommended that the parties to the Paris Agreement: (a) encourage meaningful engagement among themselves and with space agencies and climate change modellers in the systematic monitoring of greenhouse gas concentrations and emissions; (b) continue to provide for and support open data sharing; and (c) enhance the development of climate services.

31. Similarly, the symposium recommended promoting transparency and confidence-building through sound and respected regulatory mechanisms given that such mechanisms are as important as space-based technologies themselves.

32. It was considered essential to ensure the continuous provision of consistent data and information to Governments in order not only to inform the decision-making process but also to facilitate enforcement actions.

33. In order to protect the Earth and the space environment while combating climate change, verification and compliance mechanisms should be strengthened, including with the assistance of space technologies.

34. In order to promote science education, and in particular space science, the symposium recommended the establishment of training and networking initiatives for high-school pupils, such as the She Space international initiative for girls, as an excellent model for motivating young people.

35. Space-based tools can facilitate sustainability and efficiency in agriculture so as to mitigate the impact of that sector on the climate while at the same time increasing the resilience of agricultural practices to the impact of climate change. Integration with other tools and datasets, such as in situ data, can increase the effectiveness of those solutions.

36. The integration of Earth observation data with data cubes can enhance monitoring of urban development and support disaster management. However, it was recommended that new models be developed so as to further integrate social media and socioeconomic indicators into real-time mapping and predictive analytics.

37. The symposium welcomed the planned Space for Climate Action initiative of the Office for Outer Space Affairs as a means of ensuring that all countries – developing countries in particular – have access to information and develop their capacity to use space-based technologies to address the most critical challenges facing the world.

38. Participants recommended that the Office for Outer Space Affairs focus on (a) promoting the use of space technology for climate action; (b) conducting capacity-building activities to design, monitor, evaluate and implement projects that use space-based technologies to address climate change; (c) developing capacity through various mechanisms, including technical advisory missions, institutional strengthening missions, programme support and initiatives aimed at youth participation; (d) facilitating collaboration between government agencies, academia and United Nations entities in order to assist them in developing and implementing national and regional climate adaptation and mitigation projects, including novel approaches involving the private sector; (e) actively supporting and contributing to the international Space Climate Observatory; and (f) encouraging the integration of space technologies and space application into climate action funding and national action plans.

## **VI. Conclusions and lessons learned**

39. The symposium offered attendees an opportunity to explore tools, policies and approaches that could be adopted according to regional, national or local context. Users of space applications presented examples of concrete climate action and lessons learned and legal experts discussed the role of space applications in climate-related policies. Positive feedback from attendees on the large range of topics addressed confirmed the need to maintain a cross-cutting approach. As the ultimate goal of the symposium was to raise awareness of successful initiatives, the participation of representatives of a large number of Member States was particularly welcome.

40. Remote attendance provided some advantages compared with attendance at a physical event, notably a larger number of participants and the decoupling of speaker and participant selection from any financial limitations. The removal of those limitations also made it possible to provide younger and less experienced speakers with an opportunity to contribute to the event. The web-based communication platform used also enabled attendees to ask questions immediately and in a democratic manner throughout the event. Further use of the online platform for future events was recommended by several participants.

41. Since the online format presented numerous challenges, thorough preparation by the co-organizers was necessary. The feedback from participants was

overwhelmingly positive. Words of appreciation were received from speakers and from attendees in all regions of the world. Participants appreciated the variety of the topics and several reported that the event had enabled them to identify points of contact for new collaborative activities.

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