

International Rollout of a Digital Twin for Disaster Prevention Combining Satellites and AI in Collaboration with the United Nations and British Commonwealth of Nations

SpaceData Inc.

Overview of the case

In collaboration with the United Nations Office for Outer Space Affairs and the British Commonwealth of Nations, an integrated digital twin that combines AI and satellite data and was developed in Japan has been implemented in the pacific-island nation of Tonga, the African nation of Ghana, and the Central and South American nation of Trinidad and Tobago. The system presented the damage caused by disasters such as rises in sea level and floods visually in 3D, and supported the national and local governments' disaster countermeasures. As a technical partner for the joint declaration issued by the United Nations Office for Outer Space Affairs and the British Commonwealth of Nations in June 2025, this initiative has taken on the challenge of collaborating on disaster management and emergency response in countries worldwide and on supporting sustainable development in developing countries, and of presenting a new model for international cooperation that will see Japanese space AI startups working alongside international organizations.



Case of a digital twin for disaster prevention combining satellites and AI rolled out in collaboration with the United Nations and British Commonwealth of Nations

Key points regarding receiving the award (Comments from the selection committee)

The following points are all highly commendable: collaborating with the United Nations to develop an integrated digital twin combining AI and satellite data to simulate flood damage and visualize risks; implementing it in Tonga, Ghana, and Trinidad and Tobago; and also contributing to Japan's international cooperation.

This project clearly focuses on a solution that uses AI to generate 3D city models through space utilization, and is highly commendable for contributing to disaster relief in developing countries.

Specific results, etc.

1. Contributing to the creation of new fields (building national resilience) in space development and utilization

In September 2024, a joint project was launched with the United Nations Office for Outer Space Affairs with the aim of contributing to disaster response support and the utilization of space technology through an integrated digital twin that uses satellite data and AI. Tonga suffered a tsunami disaster in 2022. Working with the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), the company generated a high-precision digital twin of that country, then ran simulations of the impact a flooding disaster will have. This contributed to the development of natural disaster countermeasures and the improvement of opportunities for disaster prevention drills and education. In June 2025, the United Nations Office for Outer Space Affairs and the British Commonwealth of Nations signed a joint declaration to accelerate the utilization of space technology for sustainable development. This joint declaration was prompted by the company's achievements (technical implementation of 3D flood simulation and risk visualization using satellite data and AI) in the British Commonwealth of Nations member states Ghana and Trinidad and Tobago starting in January 2025.

2. Expanding the space development and utilization market and implementing satellite data in society for collaborative development fields

After starting a joint project with the United Nations Office for Outer Space Affairs in September 2024, the company began providing the AI-based digital twin technology to other countries, with a focus on developing ones. In particular, prompted by its provision to Tonga, requests for implementation were received from over 20 countries, including Thailand, Malaysia, the Philippines, Brazil, and Sri Lanka. Based on this track record, in April 2025, the company was entrusted by the Ministry of Land, Infrastructure, Transport and Tourism to conduct a project titled "Research work on building an urban digital twin using satellite data to promote town development DX," which targeted Southeast Asia, etc. In August 2025, it used the Space Strategy Fund to provide flood simulation results for the purpose of raising awareness of flood damage in Thailand. Through these contributions, based on the June 2025 joint declaration by the United Nations Office for Outer Space Affairs and the British Commonwealth of Nations, opportunities for Japan-led initiatives were created such as proposing the use of satellite data as a disaster response support scheme for small-island developing countries vulnerable to climate change and natural disasters, for the 56 member states of the British Commonwealth of Nations, and for other countries as well.

3. Contributing to the advancement of robust national infrastructure across the world

With disasters such as torrential rains, earthquakes, and landslides occurring frequently all

around the world, the ability to quickly and accurately grasp the situation and make decisions under extreme conditions is essential. However, conventional disaster prevention infrastructure had limitations in terms of accurately perceiving the conditions on the ground, as it was difficult to get a three-dimensional grasp of the complex, multilayered structures of buildings, transportation networks, and flows of people. This achievement uses SpaceData Inc.'s patented technologies (notably, AI technology for generating 3D city models from satellite data) to integrate multimodal data into a single system through AI analysis that combines satellite data, GIS, meteorological information, and more. This has enabled high-precision 3D spaces to be generated, something that was difficult to achieve with conventional technologies. Consequently, a variety of disaster conditions can now be reproduced and verified even in normal times, making it possible to grasp in advance the differences in the progression of damage depending on structures, topography, and social dynamics, and to identify bottlenecks in people's evacuations and in industrial networks. This has contributed to the development of a resilient national infrastructure that will comprehensively support not just adapting to climate change and responding to natural disasters, but also maintaining national core infrastructure, establishing immediate response systems for large-scale and complex disasters, and ensuring that social infrastructure continues to function.

4. Contributing to the enhancement of citizens' understanding and to human resource development

The company spread word of the technology widely both domestically and internationally as a cutting-edge project combining space and AI. The case of Tonga was presented at the United Nations Summit of the Future and the United Nations Office for Outer Space Affairs' Space4Water project in September 2024, and at the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space (COPUOS) in February 2025. In addition, the cases of Ghana and Trinidad and Tobago were presented at a side event of the main committee meeting of COPUOS in June 2025, and were posted on the official website and report for "The Ninth Tokyo International Conference on African Development (TICAD 9)" held in Japan in August 2025, and also on the Cabinet Office's official website in September 2025. Information was also presented at the United Nations Office for Outer Space Affairs' Space4Ocean Alliance in June 2025 and at the United Nations Global Service Centre (UNGSC)'s digital twin workshop in November 2025.

In terms of developing next-generation human resources, at TICAD 9 in August 2025, practical knowledge using satellite data was provided through demonstration classes on space education for elementary and junior high school students in Kenya, Rwanda, and Japan, the holding of which was prompted by this achievement. The increased opportunities to use and learn from satellite data contributed to sparking interest in STEM, raising the level of disaster prevention literacy, and expanding the breadth of learning.

