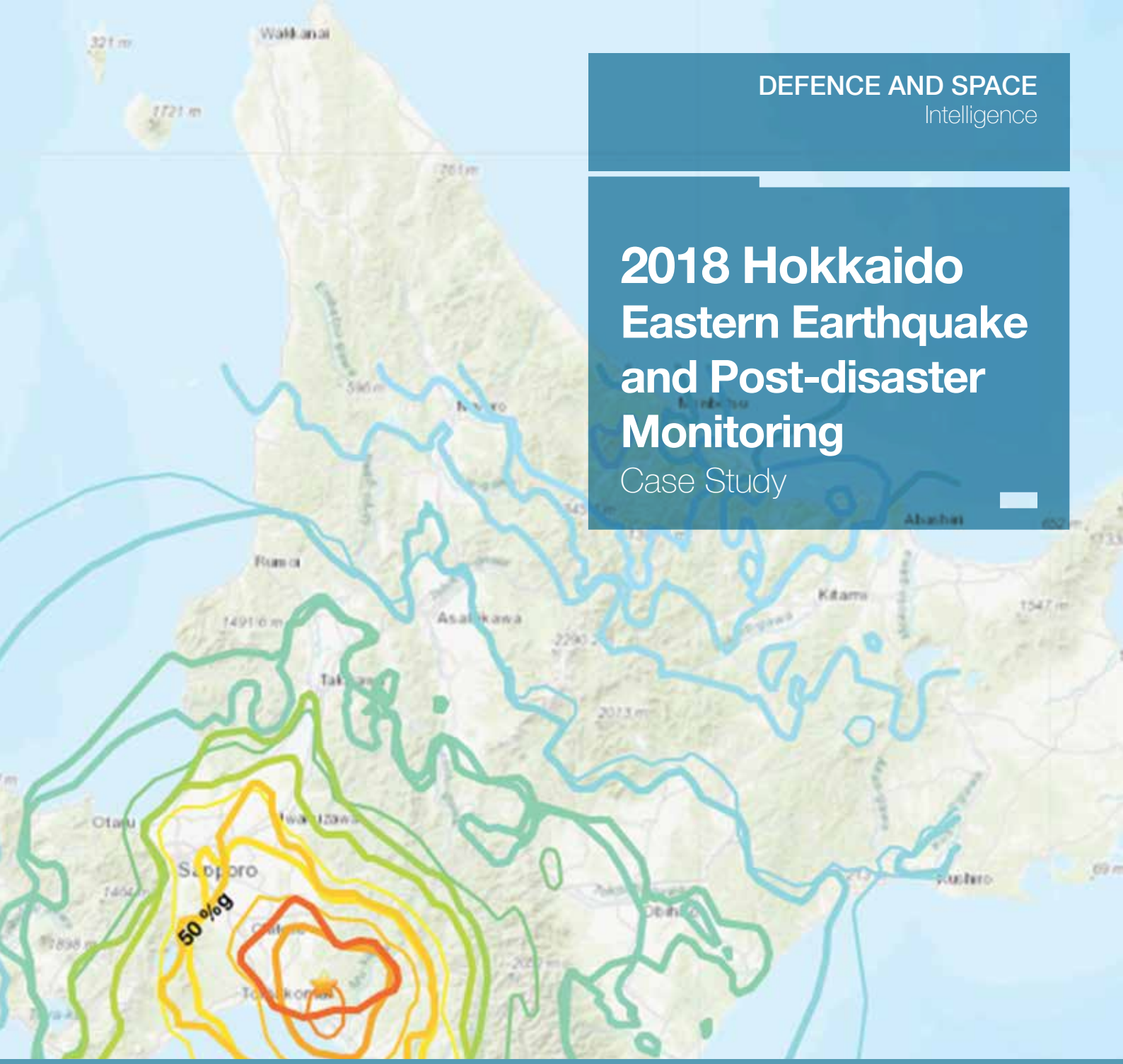

DEFENCE AND SPACE
Intelligence

2018 Hokkaido Eastern Earthquake and Post-disaster Monitoring

Case Study

Challenge

Japan is constantly under threats from natural disasters. To protect people's lives and minimise economic losses, the proper authorities need immediate information from the affected areas.

Solution and Results

SPOT and Pléiades played vital roles, as well as valuable added information from PASCO which were provided to various organisations for the post-disaster monitoring of 2018 Hokkaido earthquake.

Benefits

Earth observation satellite imagery from Airbus combined with the expertise of the Direct Receiving Station (PASCO) are an effective way to monitor areas affected by natural disasters.

AIRBUS

> **PASCO supports disaster prevention, mitigation and emergency response activities using its geospatial information technology to secure lives and property to help avoid stagnation in economic activities. The benefits that Pléiades and SPOT imagery provide, can be combined with other geospatial information and data so that PASCO can help responders prioritize disaster response and reconstruction work.**
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> ISHIZUKA Takaya, Satellite Business Division, PASCO CORPORATION

A) Sediment movement traces, etc. are shown in red patches extracted from SPOT imagery by automatic analysis.

B) Pléiades imagery acquired on September 11, 2018 shows a landslide upstream on the Horonai River in Hidaka.

Challenge

On September 6, 2018, an earthquake occurred in the central-eastern part of the Iburi area in Hokkaido, Japan. The strong tremors and massive landslides caused enormous damage to structures such as houses and roads. According to Fire and Disaster Management Agency reports, the death toll rose to 41 and 749 people were injured, while 409 houses were completely destroyed, thousands were half- or partially destroyed. Water and electricity supplies were cutoff across the island.

It was highly crucial to collect critical information soon after the earthquake and efficiently provide it to the relevant ministries and organizations including: the disaster affected municipalities, private corporations, media, etc.

SPOT and Pléiades satellite imagery were acquired to grasp an overview of the wider areas of destruction quickly and precisely to facilitate damage assessment and prevent secondary disasters and enable smooth recovery work.

Solution and Results

Thanks to the Okinawa Ground Station in Japan, SPOT imagery production was performed and delivered within 4 hours of acquisition. A report was produced and delivered quickly after.

PASCO significantly contributed to the swift understanding of the situation by providing collected and analyzed information such as:
- Automatic interpretation of sediment movement based on SPOT satellite imagery that were interpreted through advanced image analysis with in-house (PASCO) algorithms.
- Numerous occurrences of slope collapses were clearly observable on 50 cm Pléiades image.
- Aerial Photography
- Superimposing Pléiades and SPOT imagery to then layer vector information on top. The vector information are also overlaid.
- Creation of 3D information for the landslides
- Satellite images from night time acquisition.

Organisations Involved

PASCO CORPORATION entered into a distribution agreement as a Direct Receiving Station with Airbus Defence and Space in 2003, when PASCO purchased Pixel Factory to produce 3D mapping products. Now they can sell SPOT 6/7, Pléiades, and TerraSAR-X imagery on behalf of Airbus.

Established in 1953, PASCO is a Japan-based company and aims not only to observe the earth from spaceborne to shipborne by surveying and highly advanced measurement technology but also to integrate every “measurement” into geospatial information.

PASCO
Surveying the Earth to Create the Future

Benefits

Earth observation satellite imagery is one of the main resources to monitor natural disasters. The four optical satellites (Pléiades 1A and 1B and SPOT 6/7) are operated on the same orbit and offer the perfect combination of wide swath, fine monitoring and revisit. SPOT 6/7 benefit from high resolution, broad coverage, enabling a revisit at least once a day for any point on Earth, and hence a rapid identification of the location and extent of post-disaster damage making them most suitable for disaster monitoring.

Pléiades’ 50cm resolution offers an optimum level of detail with location accuracy and excellent image quality makes the imagery ideal for information extraction for a post- disaster situation. PASCO downlinks the SPOT and Pléiades data at the Japanese Ground Station and offers the deliverable products in a timely manner.

PASCO has successfully monitored several disasters in the past by utilising various EO satellites’ imageries for both Japan and other countries. Utilisation of multi-source and multi-temporal data, speedy processing, 3D data creation, automatic change detection methodologies and rapidly information provision are highly crucial aspects in the hours and days after any disaster.

Spaceborne derived information has witnessed the increasing initiatives aimed for wide area coverage and for timely assessments. The satellite constellation of Airbus meets the optimum services for mitigating disasters in Japan and globally.

Airbus
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