JAXA’s Disaster Monitoring Activities
- the case of Great East Japan Earthquake-

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1. JAXA’s role in Disaster Management Scheme

JAXA provides:

- Disaster observation data
- Emergency observation data
- Difference extraction information
- Satellite geographical information (including training)
- Know-how on image analysis

Disaster prevention agencies provide:

- Utilization Results Report
- Advice and recommendation
- Request for utilization and information systems

Agreement (with Cabinet Office)

Disaster Management Support Systems Office

Observation request

Data provision

Cabinet Office (Disaster Management)
National Police Agency
Ministry of Defense
Geospatial Information Authority of Japan
Meteorological Office

Cabinet Secretary
Fire and Disaster Management Agency
Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
Japan Coast Guard
Other Agencies
### 2. Activity themes and summary of Demonstration of Daich Applications in Disaster Management

<table>
<thead>
<tr>
<th>Application Theme</th>
<th>Summary</th>
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<tbody>
<tr>
<td>Map Application</td>
<td>Overlap “Daichi” and geographical data and utilize it for disaster prevention and response</td>
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<td>Volcanic eruptions</td>
<td>Utilize “Daichi” data for monitoring active volcanos and capturing the situation of damage caused by eruptions</td>
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<td>Crustal deformation</td>
<td>Utilize “Daichi” data for detecting the crustal deformation and capturing the situation of disasters</td>
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<td>RAS applications</td>
<td>Utilize “Daichi” data for the Real Damage Information Analysis System (RAS) led by Cabinet Office</td>
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<td>Marine and coastal disasters</td>
<td>Utilize “Daichi” data for the response to marine and coastal disasters such as heavy oil spills</td>
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<td>Landslide disasters</td>
<td>Utilize “Daichi” data for predicting landslides and the response to landslide disasters</td>
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<tr>
<td>Wind and flood damage</td>
<td>Utilize “Daichi” data for capturing the situation of flood damages and for other disaster management activities</td>
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3. “DAICHI Disaster Prevention Map”

- Indicating details of public infrastructure such as railroads, roadways, bridges, police and fire stations as well as evacuation centers.
4. Disaster Prevention Drill

In the disaster prevention drill at the local government, JAXA provides ALOS images for demonstration.

Kouchi

Mie
5. JAXA’s actions after the Earthquake

(1) 3/11 night - 3/12 morning

- JAXA prepared “Daichi Disaster Prevention Map” overlayed geographical information and provided to the Cabinet Office.
# 6. Overview of satellite data utilization

## Satellite List providing images in response to Great East Japan Earthquake

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<tr>
<th>International Charter</th>
<th>Sentinel Asia</th>
<th>Others</th>
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<td><strong>Country. Regions</strong></td>
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<td><strong>India</strong></td>
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<td>LANDSAT-5</td>
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<td>Quickbird-2</td>
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<td>RADARSAT-2</td>
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<td>Germany</td>
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<td>TerraSAR-X</td>
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<td>France</td>
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<td>RapidEye</td>
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<td>FORMOSAT-2</td>
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</table>

Special thanks to the participating nations:

- USA
- India
- Thailand
- NARL
- Italy
- Spain
- Russia
- UAE
- Japan

Produced by: [International Charter](https://www.internationalcharter.org)

Contact: [info@internationalcharter.org](mailto:info@internationalcharter.org)

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The satellite data provided by these nations were instrumental in the response to the Great East Japan Earthquake, offering crucial imagery for disaster assessment and recovery efforts.
7. Examples of observation results (AVNIR-2)

Ofunato City
- Collapse of bank

Minami-Sanriku Town
- Flooded areas

Minami-Soma City
- Flooded areas

Rokko-Ohashi Bridge
- Collapse
8. Evaluation and analysis using SAR

Evaluation of the water-covered area using PALSAR (about 150km²)

Comparison between March 13 and 14 data

Using also TerraSAR-X data provided via International Charter
9. Analysis of flooded areas

- Detecting the square measure for each cities and towns
- Providing to Cabinet Secretariat, Cabinet Office, MLIT, MAFF, etc

Flooded Areas Decreasing as time goes by

10. Interferogram Image using PALSAR
11. Detection of the Drifted Materials
12. Provision of satellite communication: KIZUNA

- March 17:
  Arrival at Iwate Pref. Office

- March 20:
  Setting up communication line between the Iwate Prefectural Office (emergency response headquarters) and Kamaishi City (Local emergency response headquarters)

- March 24:
  Setting up ground antenna at Ofunato City, and completing communication line in three points

- April 24:
  Connection completed
March 23:
Departure from JAXA Tsukuba Space Center

March 24:
Setting up ground antenna and the movable test communication terminal for the KIKU No. 8 at Ofunato City Hall.

April 4
Setting up at Otsuchi Town

April 26
Setting up at Onagawa Town

May 21
Connection completed
14. Provision of Space Technology

➢ Water Purifier

- New Medican Tech Corporation developed water purifier from the application of research results of recycling the water from wastewaters in space.
- It provided several sets of water purifier to solve the water shortage in affected areas.

➢ Space underwear

- GOLDWIN INC. developed the underwear applying the underwear for astronauts. The clothes are made of fiber that is processed to deodorize itself and stay clean.
- It provided more than 12,000 underwears. It suits the circumstance where the victims are forced to be reside in refuge places for a long period.
Conclusion

JAXA will reflect the lessons and learned of this Great East Japan Earthquake, to make the most use of Space Applications to the disaster management and mitigation.