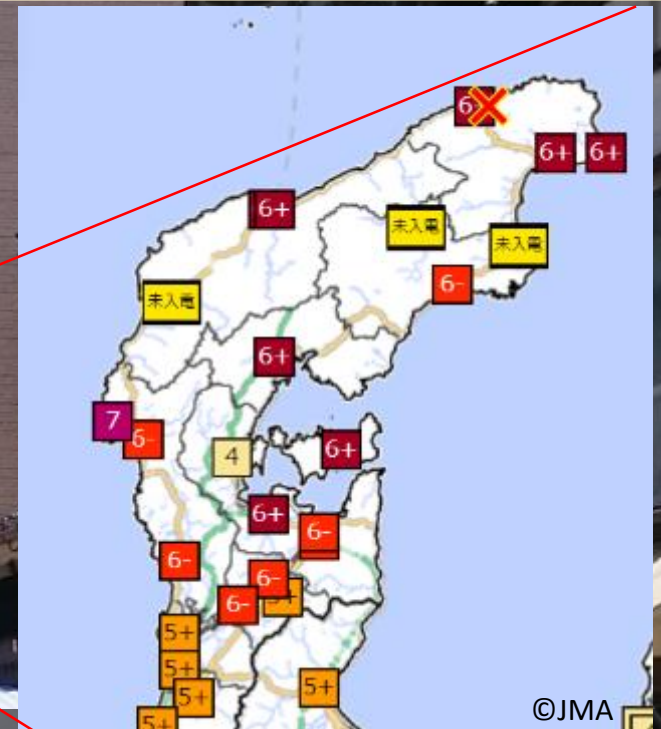
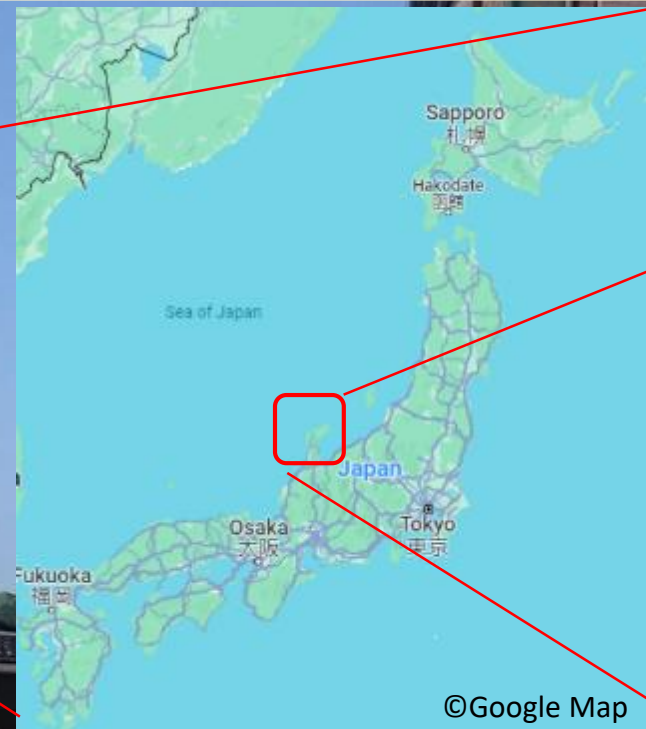
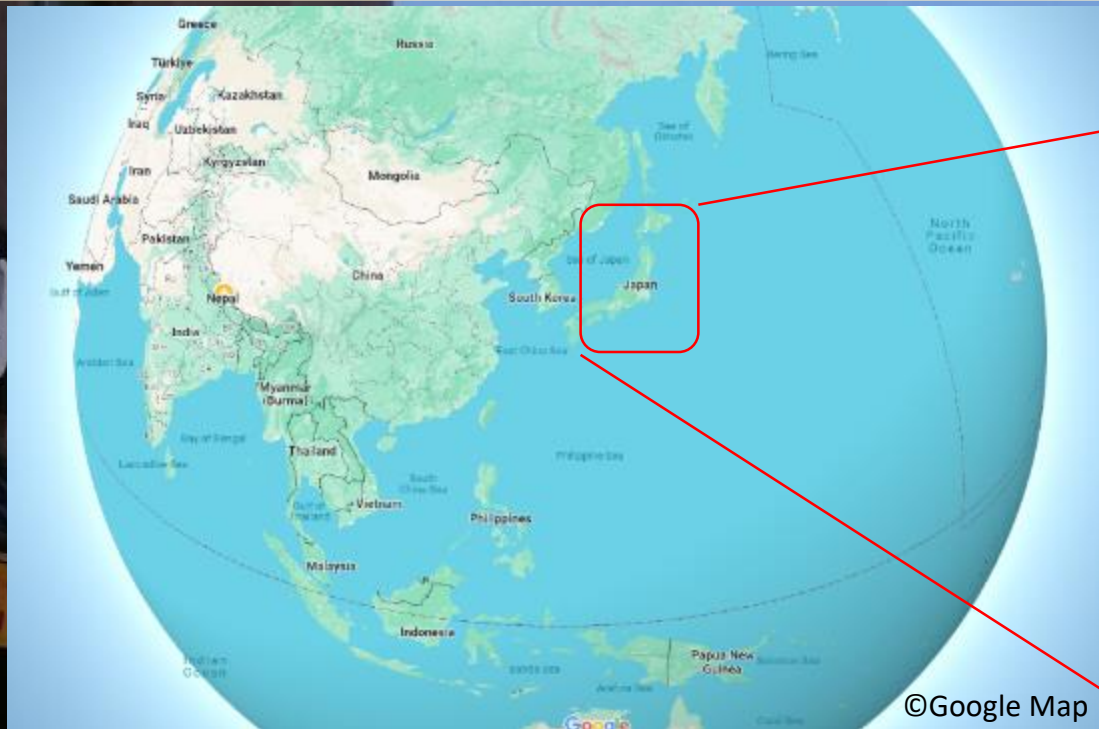


2024 Noto Peninsula Earthquake (Japan)

(GLIDE No. EQ-2024-000001-JPN)



At 16:10 on 1 January 2024, an earthquake of magnitude 7.6 on the Richter scale (GLIDE No. EQ-2024-000001-JPN) centred on the Noto Peninsula, Ishikawa Prefecture, Japan, caused a temblor of an intensity of 7 (JMA) in Shika Town, and intensity of 6+ and 6- in many municipalities in the Noto Peninsula. Also, a tsunami of up to 1.2 m was observed. The earthquake caused many deaths, injuries, collapse of houses and buildings, fires and landslides. The ADRC, the secretariat of the Sentinel Asia Project for the DRR application of space technology, received request for emergency observations after the disaster and is working to assess the damage in the Noto Peninsula, the centre of the damage, and is collecting the latest information.

Basic Information



Major cities in the Noto Peninsula region (Source: Google Map)

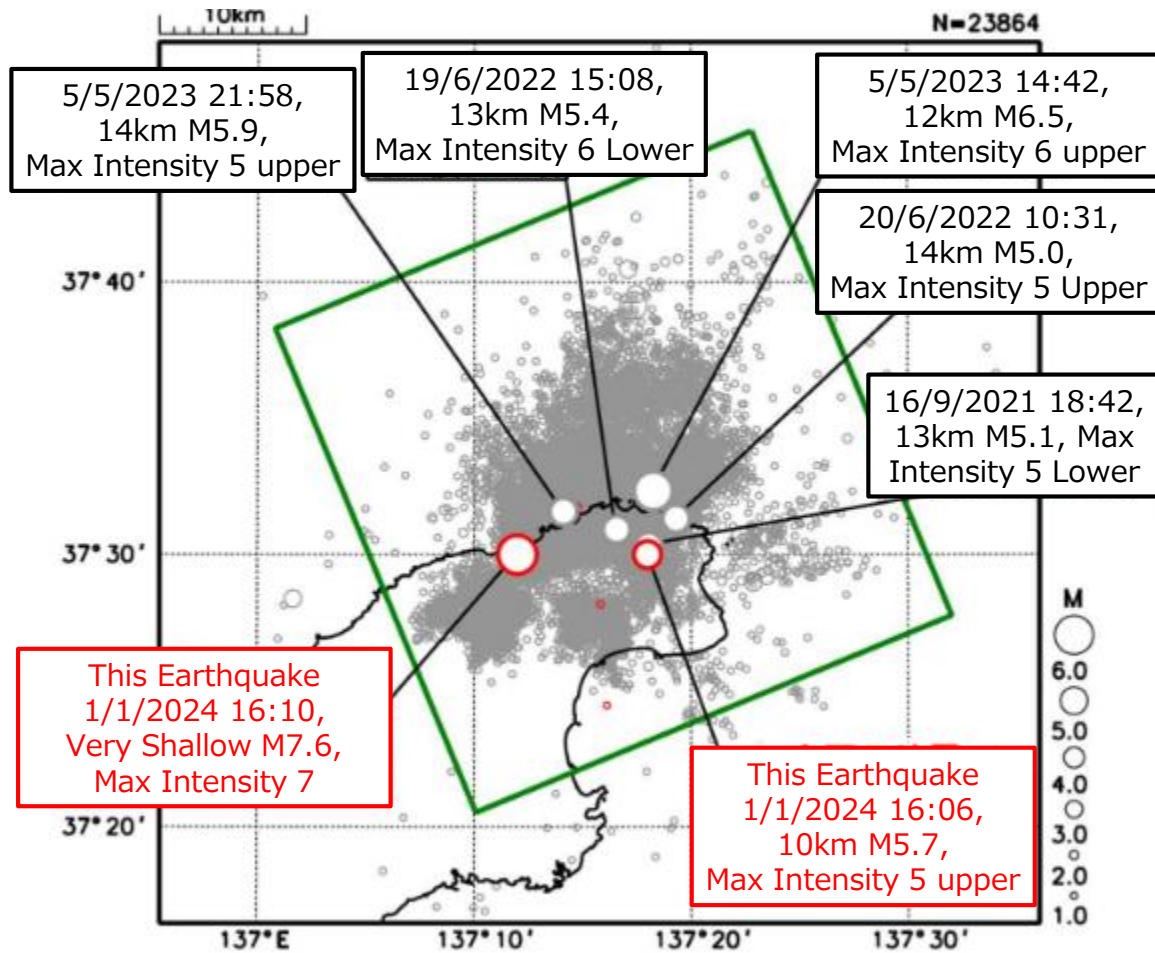
<https://www.google.com/maps/@37.2313295,137.0111647,10z>

Source: MLIT https://www.hrr.mlit.go.jp/ekijoka/ishikawa/pamphlet/ishikawa_map4.pdf, and Ishikawa prefecture https://www.pref.ishikawa.lg.jp/sichousien/documents/r5_11jukijinko.pdf

- The Noto Peninsula is located in northern Ishikawa Prefecture, Japan, and its major cities and populations (as of 1 December 2023) are Nanao (48,352), Wajima (23,192), Shika (18,267), Noto (15,224), Suzu (12,610), and Anamizu (7,360).
- Seven damaging earthquakes have been recorded since 1700, with a maximum intensity of 6+ on 25 March 2007, resulting in one death, 338 injured and 684 houses completely destroyed.
- A M5.4 earthquake with a maximum intensity of 6 on 19 June 2022 and a M6.5 earthquake with a maximum intensity of 6+ on 5 May 2023 were recorded, both resulting in human losses and house damages.
- Seismic activity has increased on the Noto Peninsula since December 2020, however, the JMA states that the relationship between the previous earthquake swarms and the current earthquake is unknown.

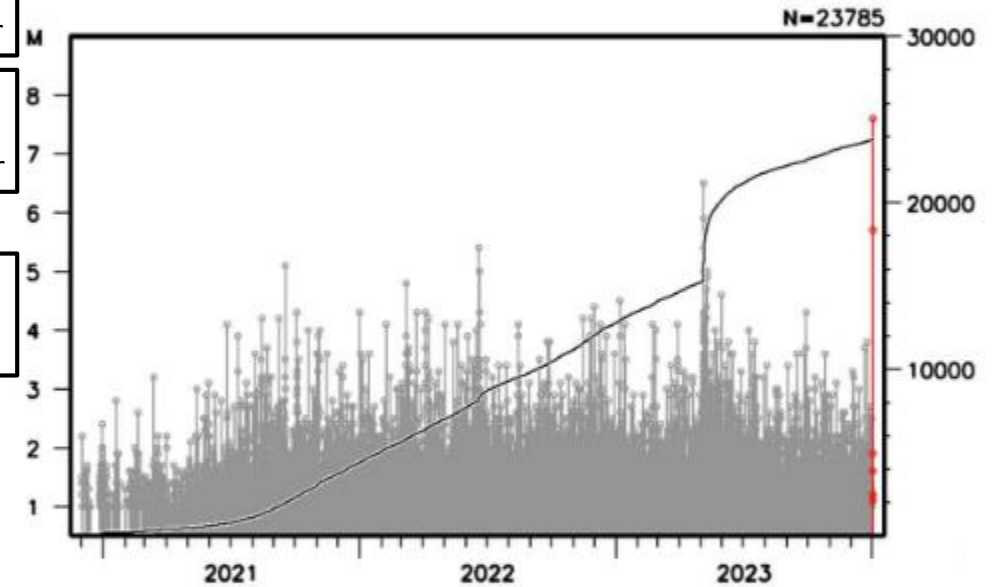
Epicentre Distribution and Seismic Activities

Epicentre distribution map
(1/1/2020-1/1/2024, depth 0-25km, >M1.0)



The size of the circle indicates the magnitude. Epicenters shown include preliminary values.

Seismic activity progression chart and frequency accumulation chart within the rectangular area shown on the left



The horizontal axis is time, the left vertical axis is magnitude, and the right is the accumulated number of earthquakes. The line graph shows the number of earthquakes added up, and the circles with vertical bars indicate the time of earthquake occurrence and magnitude.

Situation of Earthquakes and Tsunami

At 16:06 on 1 January 2024, a M5.7 earthquake with a maximum intensity of 5+ occurred with its epicentre on the Noto Peninsula, Ishikawa Prefecture.

Immediately afterwards at 16:10, a M7.6 earthquake of maximum intensity 7 occurred, and a tsunami warning was issued. At 16:21, a tsunami of up to 1.2 m was observed in Wajima Port.

The research team of the University of Tokyo reported that the estimated tsunami run-up height was 4.2 m at Akasaki port.

1 JAN	Major Earthquakes and Tsunami/ Response
16:06	M5.7, Max. Intensity 5+(JMA), VII(MMI)
16:10	M7.6, Max. Intensity 7(JMA), IX(MMI)
16:10	Initial Tsunami arrival at Wajima Port
16:13	JMA issued Tsunami Warning for a wide area of Sea of Japan coast
16:18	M6.1, Max. Intensity 5+(JMA), VII(MMI)
16:21	PTWC issued Tsunami Threat within 300km of epicentre along the coasts of Japan
16:21	1.2m Maximum Tsunami was observed at Wajima Port
16:22	JMA issued Major Tsunami Warning for Noto, and Tsunami Warning for a wide area of Sea of Japan coast
16:33	0.8m Maximum Tsunami was observed at Toyama
16:52	GLIDE (EQ-2024-000001-JPN) is issued by ADRC
19:09	0.9m Maximum Tsunami was observed at Kanazawa
2 JAN	
2:30	Tsunami Warning was changed to Tsunami Advisory
10:00	Tsunami Advisory was changed to Tsunami Forecast
12:10	Sentinel Asia activated at the request of the Ministry of Land, Infrastructure, Transport and Tourism (by JAXA as proxy).

Damage Situation (as of 14:00 on 05 February 2024)

Summary of Prefectures of Ishikawa, Toyama, Niigata, Fukui, Nagano, Gifu, Aichi, Osaka, and Hyogo
(Note: Overall situation has not been confirmed yet, especially in Wajima and Suzu cities.)

	From Official Report	Ishikawa Prefecture	Reference Information from Media
Killed	240	240	
Missing	0	11 (status unknown)	
Injured	Seriously injured: 320	312	
	Slightly injured: 971	870	
Evacuee	13,962 (in 542 shelters)	7,566 in 273 shelters	
House/ Building	Totally collapsed: 3,125	52,326 192 Official building were damaged.	<ul style="list-style-type: none"> 7-storey building overturned in Wajima city Many block walls collapsed.
	Half collapsed: 4,067		
	Partially collapsed: 23,321		
Fire	17 areas		<ul style="list-style-type: none"> More than 200 houses were destroyed in Wajima city. 20 houses were burned in Noto town
Road	2 section of 1 highway closed 12 sections of 3 sub-national roads closed 57 sections of 3 prefectural roads closed	3 villages are in a condition that makes outside access difficult or impossible.	
Lifeline	Water is cut off to 38,880 households	38,130	
	Power outage in 1,800 One nuclear power plant and one thermal power plant are shut down.		
Port	9 quays in 4 ports are available in Noto.		<ul style="list-style-type: none"> The coastline receded due to land uplift.
Airport	Emergency restoration of runway in Noto airport completed		<ul style="list-style-type: none"> ANA resumes service on 1/27 (one flight per day, Tue, Thu, Sat)

Useful Links

Situation Report (in Japanese)	
Headquarters for Major Disaster Management	https://www.bousai.go.jp/updates/r60101notojishin/r60101notojishin/
Fire and Disaster Management Agency (FDMA)	https://www.fdma.go.jp/disaster/#anchor--01
Ministry of Land, Infrastructure, Transport and Tourism (MLIT)	https://www.mlit.go.jp/saigai/saigai_240101.html#n0
Ishikawa Prefecture	https://www.pref.ishikawa.lg.jp/saigai/202401jishin-taisakuhonbu.html#higai
Geographical Data	
Sentinel Asia: Emergency Observation	https://sentinel-asia.org/EO/2024/article20240101JP.html
Geospatial Information Authority of Japan (GSI) in Japanese	https://www.gsi.go.jp/BOUSAI/20240101_noto_earthquake.html
bosaiXview, National Research Institute for Earth Science and Disaster Resilience (NIED)	https://xview.bosai.go.jp/view/index.html?appid=41a77b3dcf3846029206b86107877780
Japan Meteorological Agency (JMA)	https://www.jma.go.jp/jma/en/2024_Noto_Peninsula_Earthquake/index.html
Universities, etc.	
International Research Institute of Disaster Science (IRIDeS), Tohoku University	https://irides.tohoku.ac.jp/research/prompt_investigation/2024noto-eq.html
Earthquake Research Institute, The University of Tokyo	https://www.eri.u-tokyo.ac.jp/en/news/5994/ https://www.eri.u-tokyo.ac.jp/eq/20465/
Disaster Committee, Architectural Institute of Japan	http://saigai.aij.or.jp/saigai_info/20240101_noto/202340101_noto_eq.html

Emergency Observation by Space Satellites

The ADRC, the Sentinel Asia Secretariat, started coordinating with relevant organisations on the same day following the earthquake and tsunami reports, and JAXA requested the activation of Sentinel Asia on behalf of the Ministry of Land, Infrastructure and Transport (MLIT) on the following day (2 Jan.). The International Disaster Charter (IDC), which covers the entire world, was likewise activated on 2 Jan.

The screenshot shows the Sentinel Asia website interface. At the top, there is a navigation bar with the Sentinel Asia logo and menu items: Emergency Observation, About, Activities, Meetings, Interviews, Communications, and Contact. Below the navigation bar, the date "2024-01-01" is displayed, followed by the main heading "Earthquake in Japan on 01 January, 2024". A section titled "Emergency Obs. Request Information" contains a map of Japan with a red box highlighting the affected area in the Tohoku region. To the right of the map, the following information is listed: Disaster Type: Earthquake, Country: Japan, Occurrence Date (UTC): 01 January, 2024, SA activation Date(UTC): 02 January, 2024, Requester: Asian Disaster Reduction Center (ADRC), Escalation to the International Charter: Yes, and GLIDE Number: EQ-2024-000001-JPN.

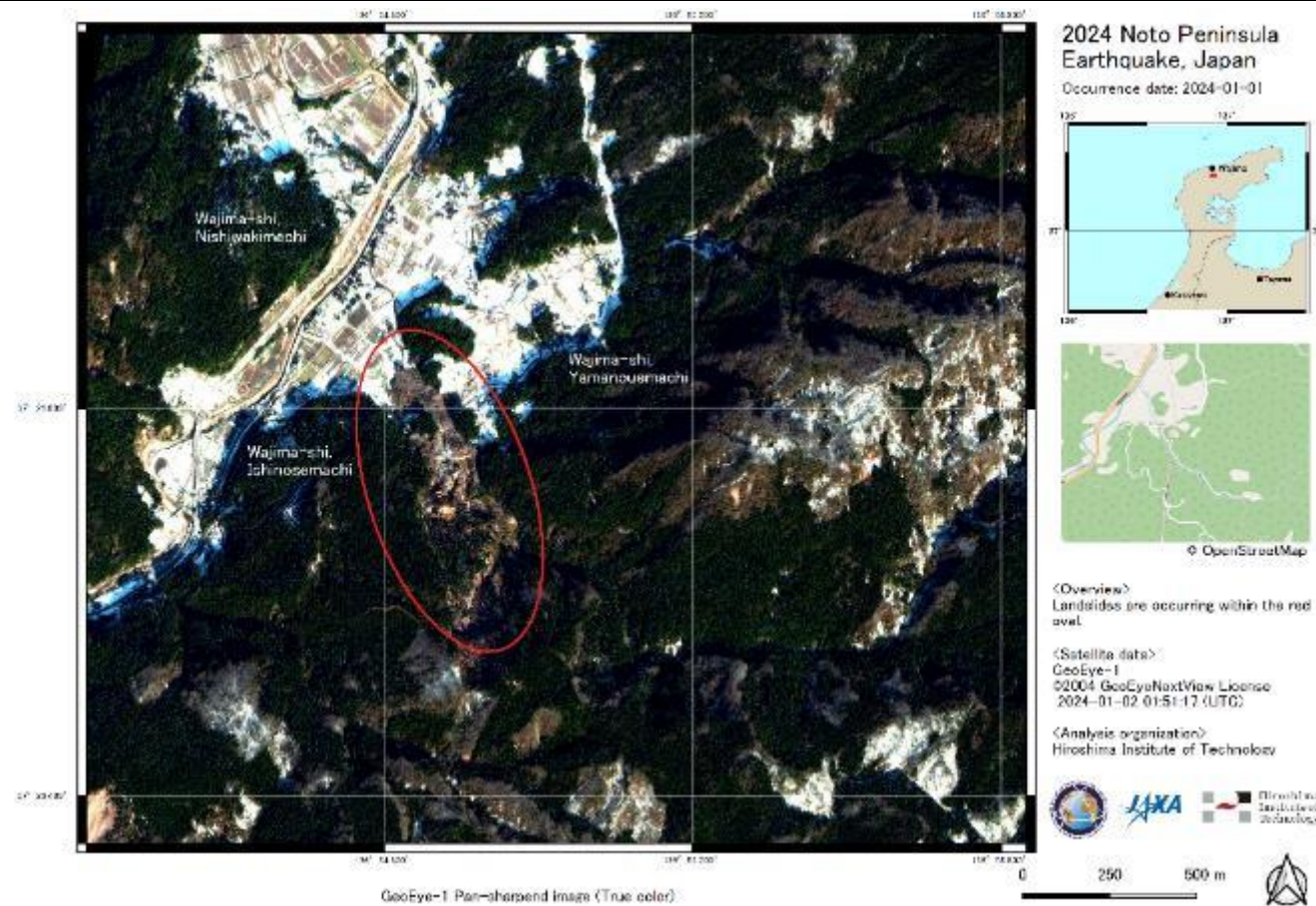
Sentinel Asia (https://sentinel-asia.org/EO/2024/article2024_01_01JP.html)

The screenshot shows the International Disaster Charter (IDC) website. At the top, there is a logo for the International Disaster Charter and the text "Charter activations". Below this, the heading "Earthquake in Japan" is displayed. The text describes the earthquake: "A magnitude 7.6 earthquake struck Japan on 1 January, leaving 48 dead and destroying hundreds of buildings. 7.6 is a major earthquake on the Richter scale, and the initial earthquake has been followed by many smaller tremors, reaching as high as 4.9 magnitude. The earthquake occurred at 07:10 UTC, in the Iwate Peninsula of Iwaki Prefecture. Hundreds of buildings were destroyed by the earthquake or by fires that followed. Roads and power infrastructure were also damaged, leaving over 30,000 people without power and affecting rescue efforts. Rescue operations have continued since the earthquake, and over 57,000 people have been evacuated so far. The death toll may rise over the next few days as the search continues, but thousands of emergency responders are working through the debris to find any survivors. The area continues to remain on alert for the impact of further tremors, which may continue for up to a week. Tsunami warnings were in place following the earthquake, but have since been lifted." Below the text is a map of Japan with a red pin indicating the earthquake location. To the right of the map is a table with the following information: Type of Event: Earthquake, Location of Event: Japan, Date of Charter Activation: 2024-01-02, Time of Charter Activation: 13:25, Time zone of Charter Activation: UTC+09:00, Charter Requester: ADRC, Activation ID: 857, Project Management: Masahiko Nagai (Yamaguchi University), University of Tokyo, Fumio YAMAZAKI (Chiba University), Tokyo Denki University, Kohji ITOH (JAXA), Hiroshi Taguchi (National Research Institute for Earth Science and Disaster Resilience (NIED)), Hiromichi FUKUI (Chubu University), Yuzo SUGA (Hiroshima Institute of Technology).

IDC (<https://disasterscharter.org/web/guest/activations/-/article/earthquake-in-japan-activation-857->)

Emergency Observation by Space Satellites

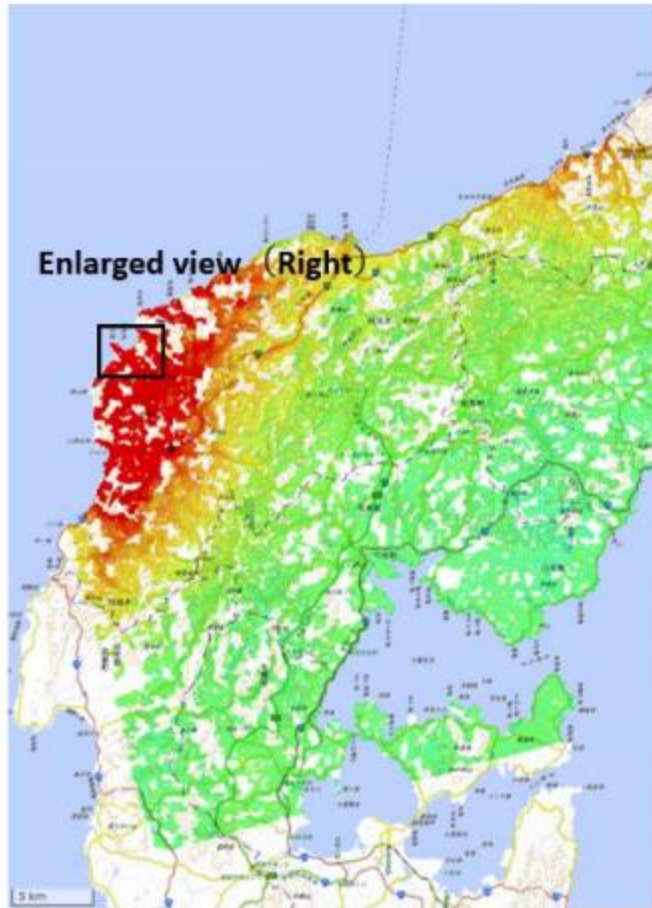
This is one of the analyzed images of the damaged area published on the Disaster Charter's website. The analysis by Hiroshima Institute of Technology shows that landslides have occurred in the red oval area.



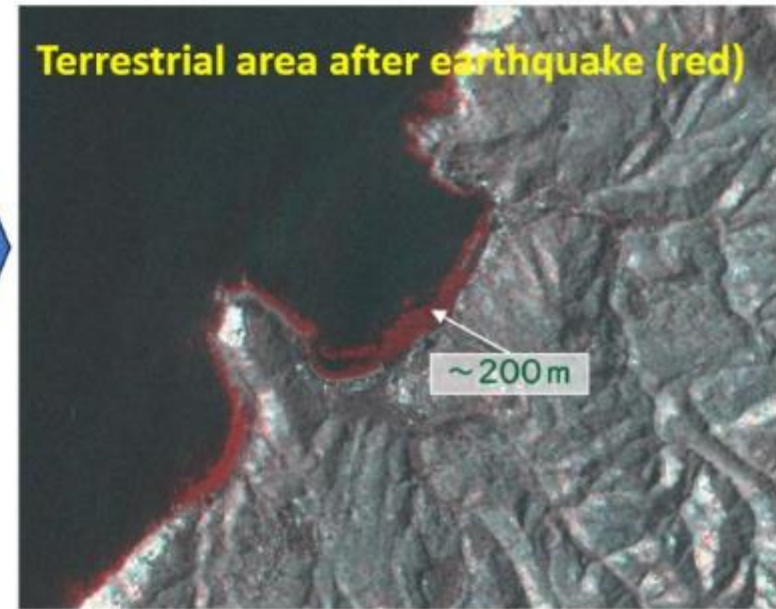
IDC https://disasterscharter.org/image/journal/article.jpg?img_id=23359466&t=1704359510653

Emergency Observation by Space Satellites

This is one of the analyzed images of the damaged area published on the Geospatial Information Authority of Japan's website. Coastline was changed caused by the Earthquake detected by ALOS-2 SAR satellite image (Jan. 4, 2024)

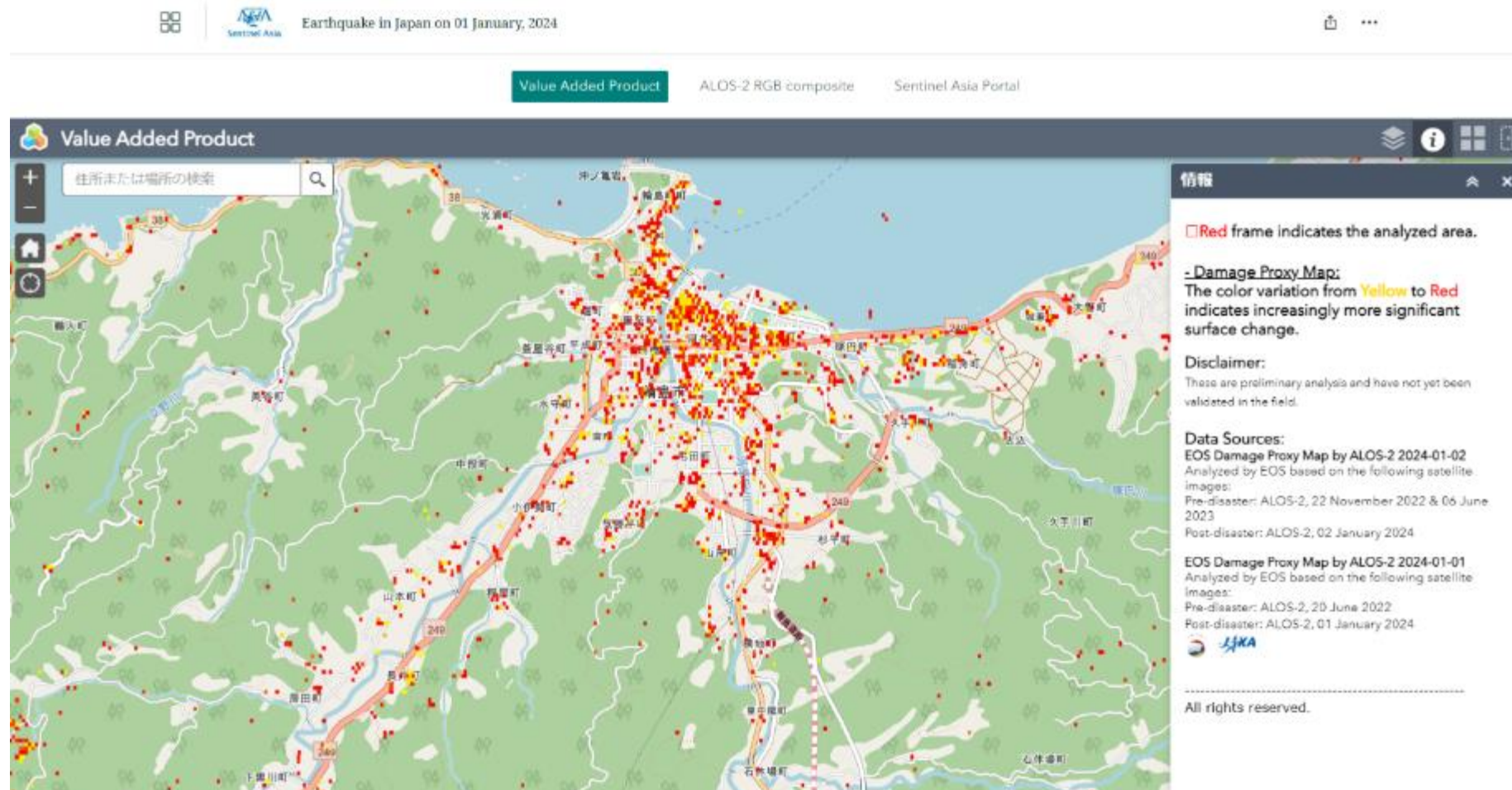


RGB Composite image



Emergency Observation by Space Satellites

This is Web-GIS to show the analyzed images of the damage situation. The color variation from **yellow** to **red** indicates the intensity of significance of surface change. These are preliminary analysis and have not yet been validated in the field.



Earth Observatory of Singapore (EOS) <https://storymaps.arcgis.com/collections/a09ef2007f444e2919615494ee2fcd8?item=1>

Emergency Observation by Space Satellites

This is one of the analyzed images of the damaged area published on the Disaster Charter's website. The analysis by Chiba University shows that **yellow** polygon was burned out.



The 2014 Noto Peninsula earthquake, Japan

Sensors: GeoEye-1

Location: Wajima City, Ishikawa Prefecture, Japan

Comparison of the pre-event optical image (Google Earth) and the post-event GeoEye-1 pansharpened image (80cm/pixel).

The region enclosed by the yellow polygon was burned out.
Mud water through Kawarada River flew into the sea.

The GeoEye-1 image is owned by DigitalGlobe, and it was provided through the International Disasters Charter.



IDC https://disasterscharter.org/image/journal/article.jpg?img_id=23402331&t=1704811410297

Emergency Observation by Space Satellites

This is one of the analyzed images of the damaged area published on the Disaster Charter's website. The analysis by Chiba University shows that **yellow** circle includes two landslides, and **red** ellipsoid is flooded by tsunamis.



The 2014 Noto Peninsula earthquake, Japan

Sensors: GeoEye-1

Location: Wajima City, Ishikawa Prefecture, Japan

Comparison of the pre-event optical image (Google Earth) and the post-event GeoEye-1 pansharpened image (80cm/pixel).

The region enclosed by the yellow circle includes two landslides, which caused road impassable. The region enclosed by the red ellipsoid is flooded by the tsunamis.

The GeoEye-1 image is owned by DigitalGlobe, and it was provided through the International Disasters Charter.



IDC https://disasterscharter.org/image/journal/article.jpg?img_id=23405438&t=1704897596118

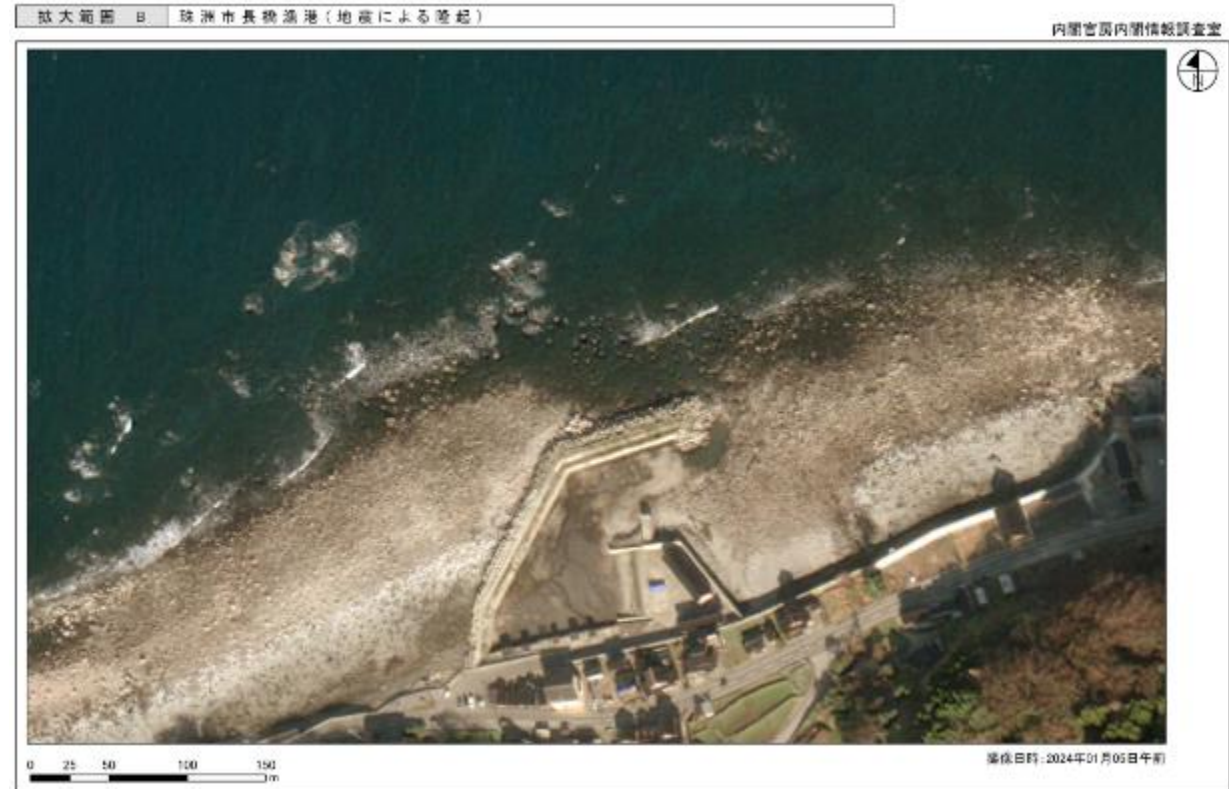
Emergency Observation by Space Satellites

The Cabinet Information Research Office collects necessary information regarding the 2020 Noto Peninsula Earthquake using information gathering satellites and others. Based on the policy of releasing processed images based on information gathering satellite images in times of large-scale disasters, etc. , government of Japan releases processed images (enlarged views of some areas).



Center of Wajima City (fire area)

Cabinet Secretariat of Japan https://www.cas.go.jp/jp/houdou/240111/kakudai_0105_e.pdf

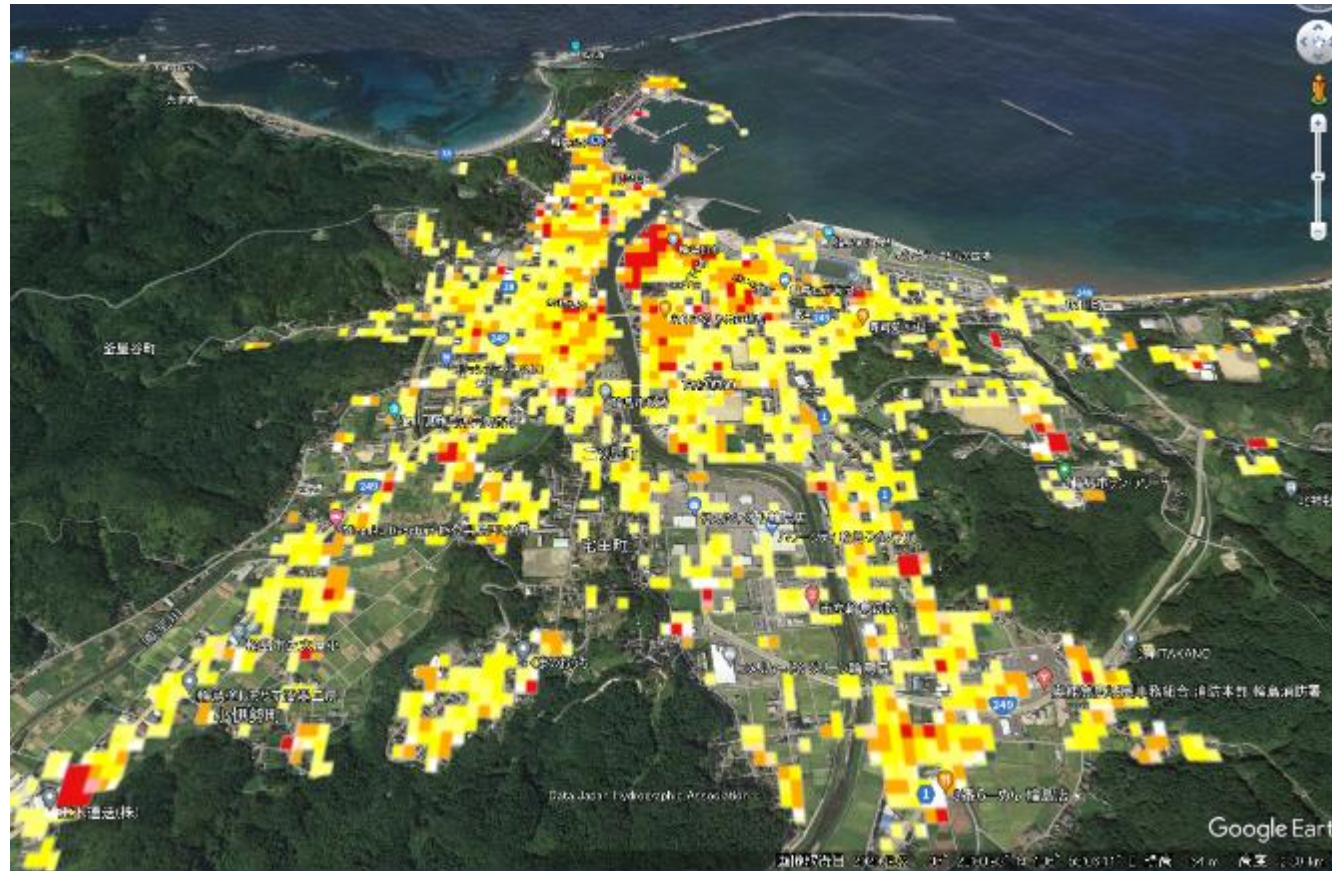


Nagahashi Fishing Port, Suzu City (uplifted by earthquake)

Cabinet Secretariat of Japan https://www.cas.go.jp/jp/houdou/240111/kakudai_0105_b.pdf

Estimation of building damage by coherence analysis of images by Space Satellite

Sadra Karimzadeh (Tabriz Univ.) and Masashi Matsuoka (Tokyo Tech) utilized the PALSAR-2 data to analysis building damages. White means Negligible damage (change) possibility, **Yellow - Slight/moderate damage (change) possibility**, **Orange - High damage (change) possibility**, **Red - Very high damage (change) possibility**



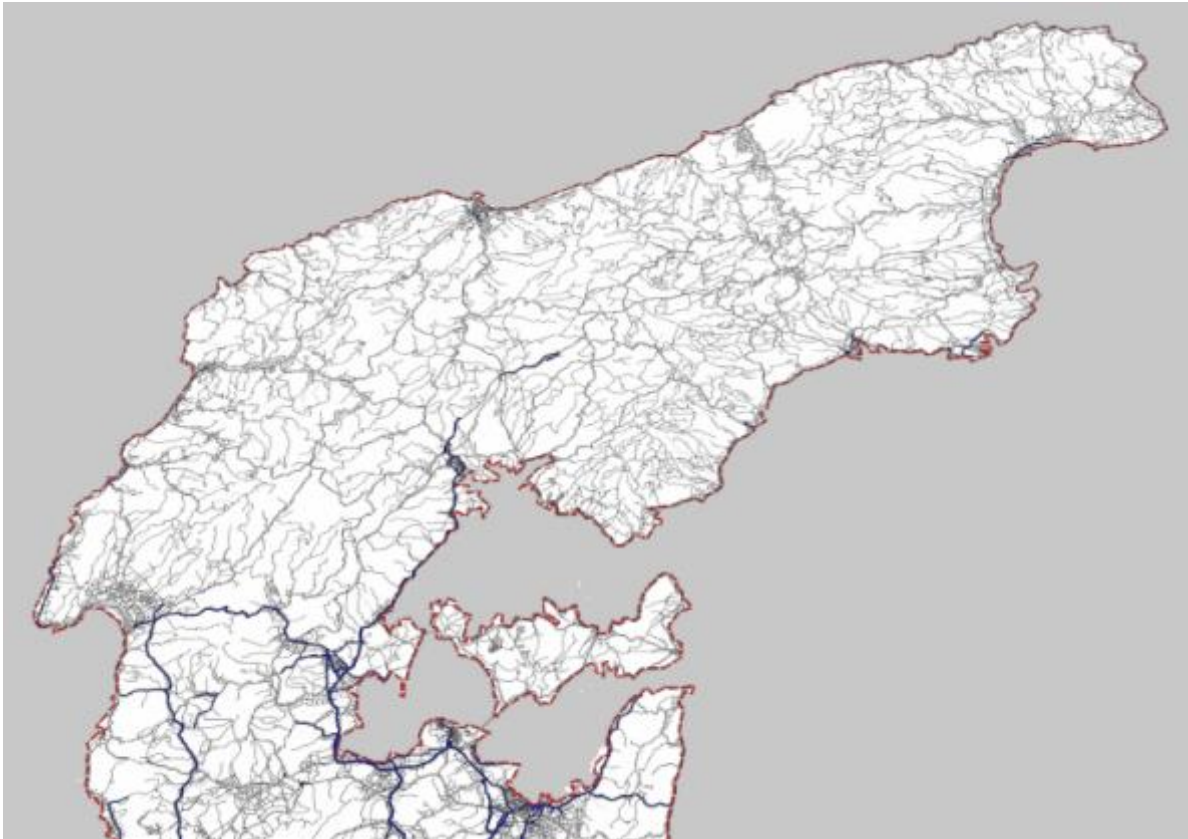
Wajima City

Matsuoka Laboratory (Tokyo Institute of Technology)

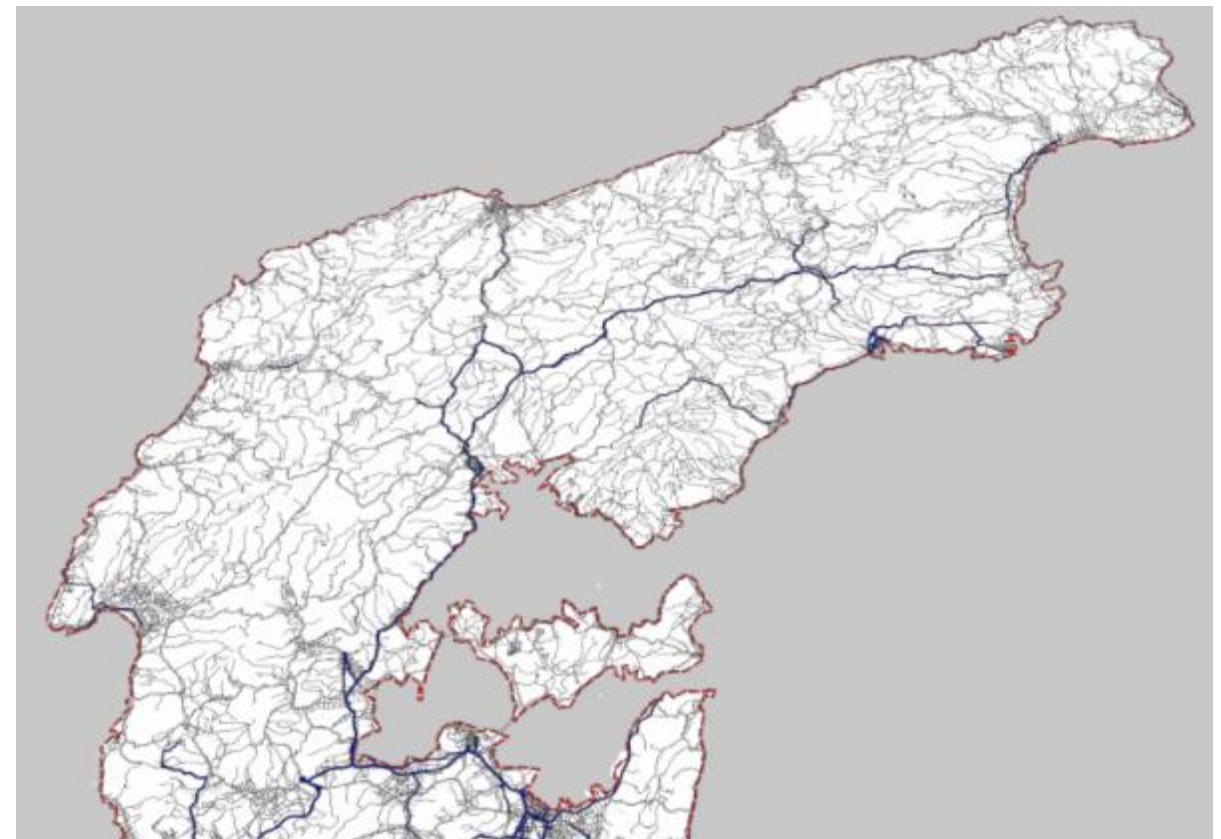
<https://sites.google.com/view/matsuokamtokyotech/response?authuser=0>

Real-time disaster information

Geospatial Information Center (GsC): A single point of access to disaster risk reduction information sharing such as aerial photo, hazard maps, traffic record map on each day, and so on.

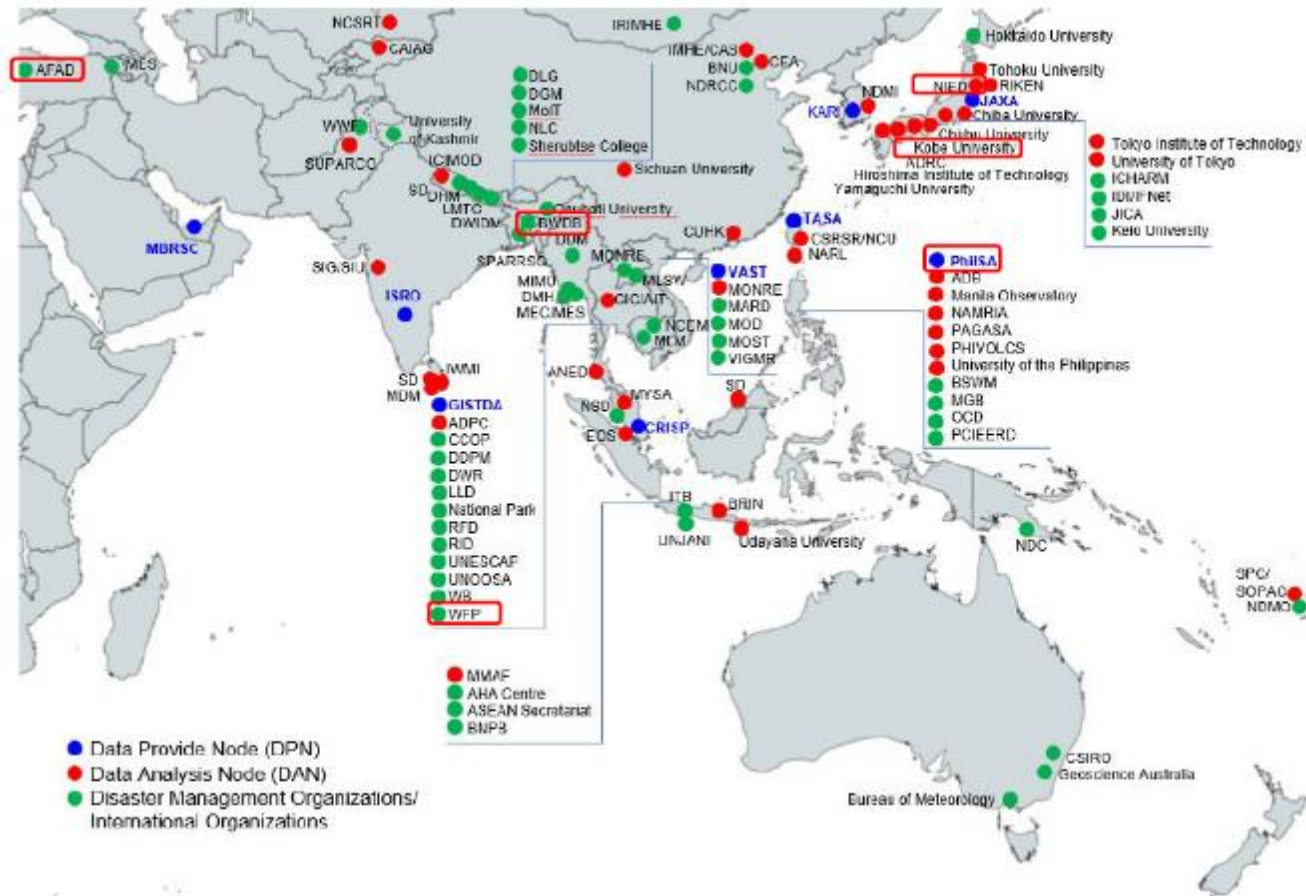


Traffic record map on 02 Jan. 2024



Traffic record map on 15 Jan. 2024

[Ref.] Sentinel Asia project

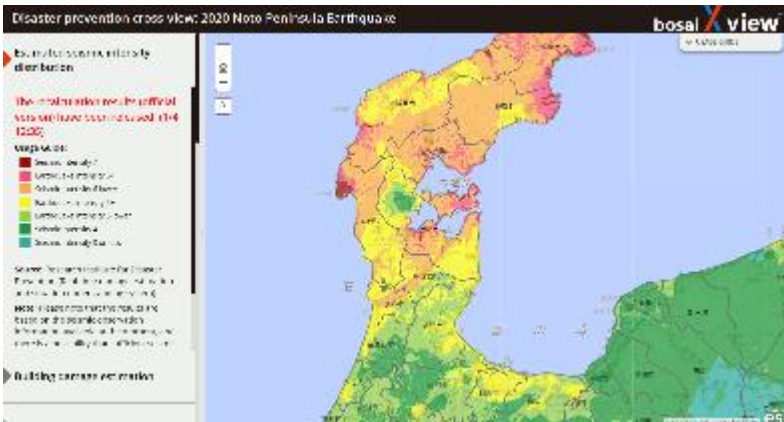


- In the event of a disaster, it is important to be able to quickly assess the disaster area for emergency response. Earth observation satellites effectively serve this purpose by analysing the disaster area and providing those data to the local community.
- ADRC continues to participate in the Sentinel Asia project, which was launched in 2006 with an objective of establishing a disaster risk management system in Asia utilizing the satellite images. ADRC functions as the focal point to receive emergency observation request in the framework of the Sentinel Asia.
- Upon receiving a request, ADRC decides whether the request is appropriate and whether the emergency observation should be implemented mainly by assessing the damages and casualties.
- Based on its own judgement, ADRC will forward the request to space agencies that participate in the Sentinel Asia Project, namely: CRISP (Singapore), GISTDA (Thailand), ISRO (India), JAXA (Japan), KARI (Korea), MBRSC (United Arab Emirates), PhilSA (Philippines), TASA (Taiwan), and VAST (Vietnam).

Currently Sentinel Asia has 114 Joint Project Team (JPT) members.
 (97 organizations from 29 countries/regions and 17 international organizations)

boisaiXview: Integrated Information Dissemination system

boisaiXview: A single point of access to disaster risk reduction information shared by the DRR Basic Information Distribution Network and others.



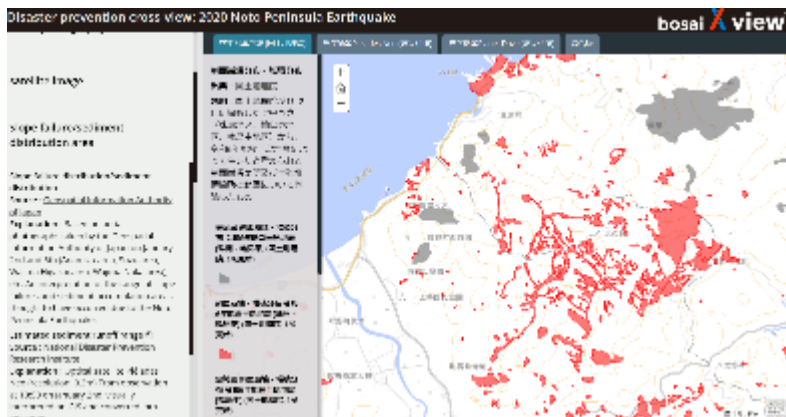
Seismic Intensity



Building damage estimation



Before and After



Slope failure/sediment disaster



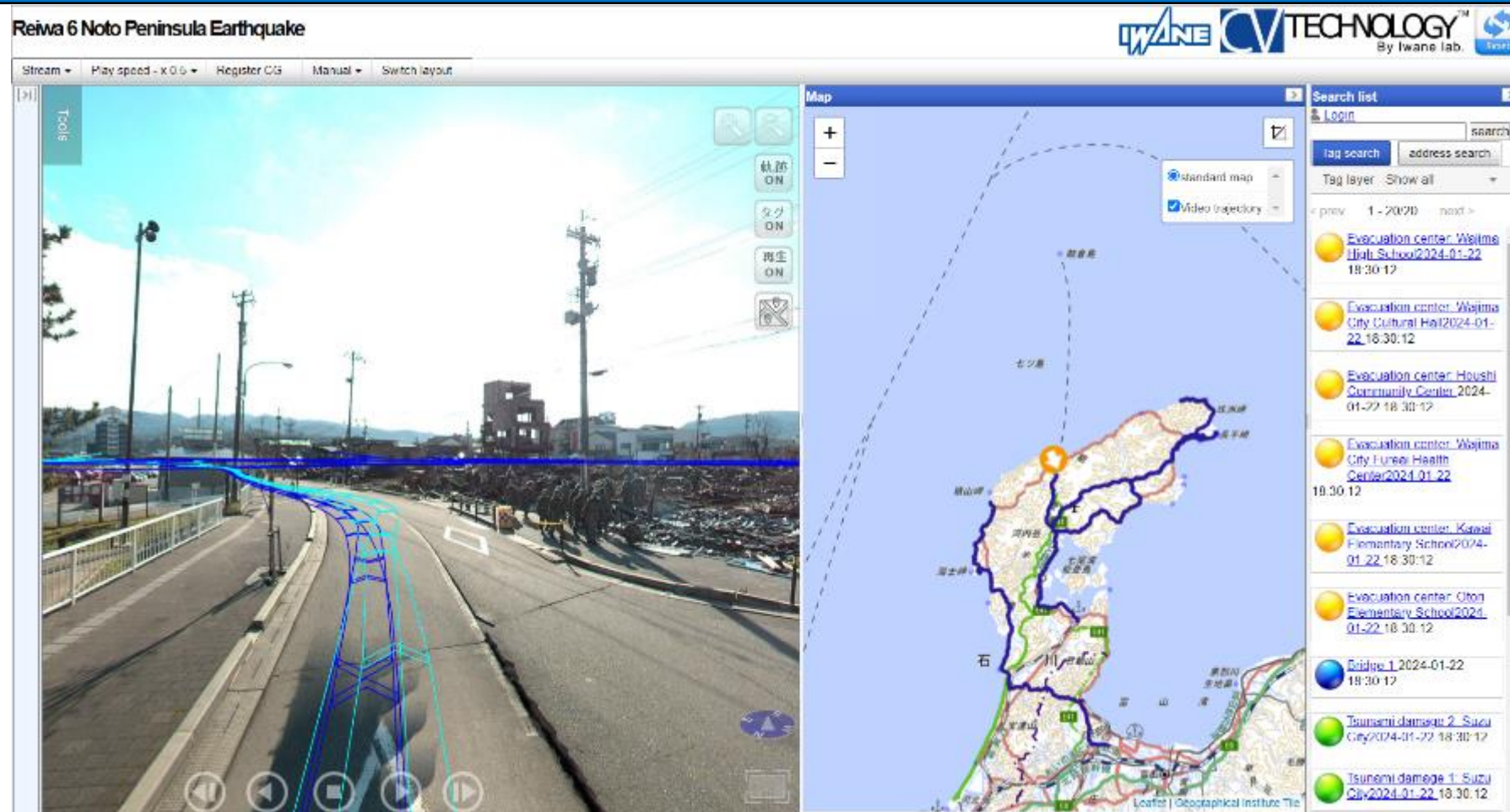
Tsunami inundation



Satellite observation

Using an IoT 3D video platform on the web to understand the situation in the disaster area

Video images taken while driving through the disaster area and a map showing the vehicle's trajectory and current location are displayed. Still image and video playback are available. Click on the map to switch to the video of that location.



Estimation of Building Damage by Visual Reading of Aerial Photographs

Damage to buildings caused by the earthquake and tsunami was estimated through visual interpretation of aerial photographs and other methods. Damage was classified into the following four categories: Destroyed or Major Damage, Survived: Partial Damage, Obstructed: Indistinguishable due to clouds, shadows, vegetation, etc., Missing or Inconsistent: Difficult to distinguish.

Disaster prevention cross-view: 2020 Noto Peninsula Earthquake

bosai view

建物被害判定 建物被害推定 災害被害物量推定

House damage situation

Presumption of the number of victims

Department, [Shunichi Koshimura](#)

Overview: We are conducting a survey centered on visual interpretation of aerial photographs with the aim of understanding the damage to buildings caused by the 2020 Noto Peninsula earthquake and tsunami. The content will be updated daily.

[Click here for the submission form for new information or corrections.](#)

📄 **Building damage estimation**
Estimated number of completely destroyed buildings by city, ward, town, village aggregation results (updated on 1/26) in Excel

Source: Research Institute for Disaster Prevention (Real-time damage estimation and situation understanding system)

Note: Please note that the results are based on the seismic observation

作成者: 東北大学・災害科学国際研究所 災害シオインフォマティクス研究分野 藤村 俊二

概要: 令和6年能登半島地震・津波による建物被害の把握を目的として、航空写真の目視判読を中心とした調査を行っています。内容は日々更新されていきます。

新しい情報または修正内容の投稿フォームはこちら

使用したデータ

- 国土地理院空中写真正射画像
- 国土地理院基礎地図情報
- 国際航業株式会社Bois/防災情報提供サービス無償版

建物被害の判定基準(正射画像または斜め視画像による目視判読)

- Destroyed or Major Damage 大規模被害: 倒壊、津波による流失、大規模な傾斜、土砂災害による埋没、火災による焼失
- Survived 部分的被害: 部分的な被害、軽微な被害
- Obstructed 判別不能: 雲、影、植生等により判別不能
- Missing or Inconsistent 判別困難: 建物輪郭が不明瞭な場合(例: 夕日、航空写真の鮮明度が低い場合)

Damage Level (東北大学 藤村教授)

- Destroyed or Major Damage
- Survived
- Obstructed
- Missing or Inconsistent

esri

Passable route map: Utilization of the latest traffic information from VICS and past statistical data

“Passable route Map” displays the traffic history of the last 24 hours on a real-time map based on probe information collected from vehicles using Toyota's telematics service.

Additionally, in the event of a large-scale disaster, users can check Toyota's proprietary real-time traffic information "T-Probe," traffic regulation information, and aerial photos of the affected area on the same screen.

TOYOTA

Path map

For safe driving in the event of a disaster

notice

The display area has been changed on January 1st due to the magnitude 7 earthquake that occurred in Ishikawa Prefecture on January 1st.

In addition to traffic records and traffic regulation information, T-probe traffic information (traffic congestion/congestion) is displayed.

The display area has been added on January 24th due to the announcement of significant heavy snowfall in Fukui and Shiga prefectures.

Choose an area

Search by city

Disaster information is being provided

Map information setting

Usage Guide

The path I took

traffic jam

congestion

traffic regulations

chain regulation

full expression

User Guide full expression

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