Safeguard

Protecting national land of Japan

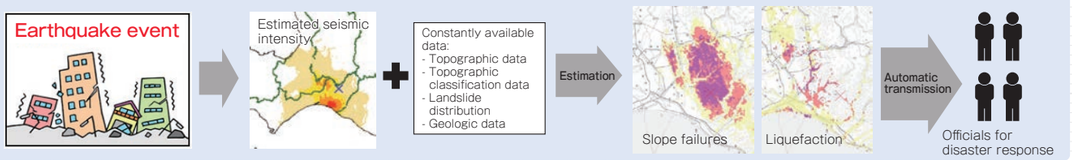
Emergency photography and its result taken by a survey aircraft, KUNIKAZE III.

Acquiring and disseminating the latest geospatial information on disaster situations with up-to-date technologies

GSI, a designated government organization under the Disaster Countermeasures Basic Act, is promoting and taking disaster-response-related policies and measures against frequent natural disasters, employing the latest survey and cartographic technologies to protect the national land and people's lives and properties.
The information collected and provided through emergency shooting and surveying necessary for understanding the disaster situation is useful for the national and local governments' disaster responses and recovery/reconstruction measures and for the people's disaster risk management.

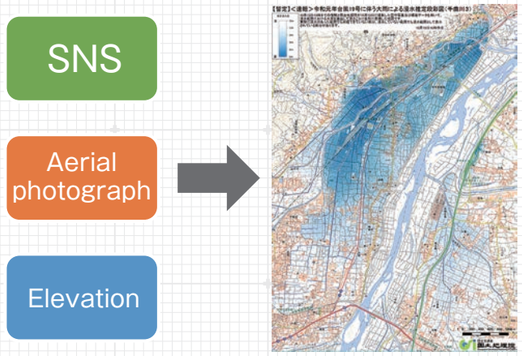
GSI provides promptly estimated seismic ground disaster data

GSI is operating a system for estimating areas possibly affected by ground disasters (slope failure, landslide and liquefaction) immediately after an earthquake has occurred, using its own immense topographic and geologic data and the estimated seismic intensity announced by the Japan Meteorological Agency. This system is called Seismic Ground Disaster Assessment System (SGDAS).
SGDAS is capable of estimating occurrences of ground disasters in areas where intense seismic movements were observed after an earthquake has occurred and promptly transmitting acquired data to the national disaster management organizations and local governments for initial responses.



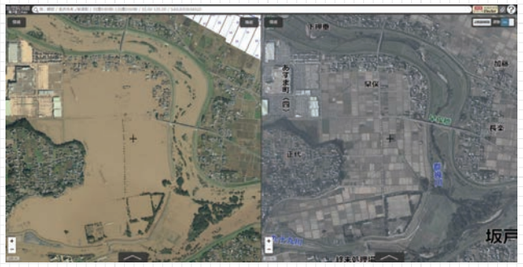
GSI's recent responses to disasters (Topics)

Identifying submergences using SNS (provisional inundation depth map) (Typhoon Hagibis in 2019)



Provisional inundation depth map is a cartographic representation of ranges and depths of submergences based on the peripheral lines of submergences estimated with data that are collected from SNS and aerial photographs, combined with elevation data.
Provisional inundation depth map were produced and delivered to the organizations concerned on the very day of disaster on the rivers Chikuma and Abukuma affected by Typhoon Hagibis in 2019. Such data are utilized for preparing drainage pump vehicle assignment plans and recovery and rescue activities.

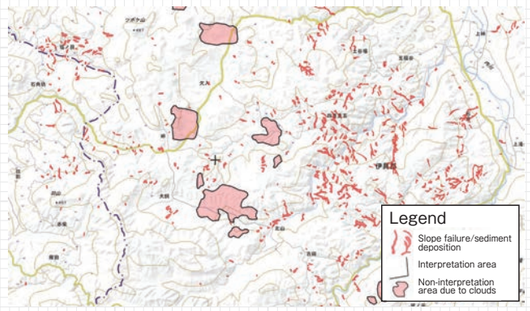
Emergency aerial photography and "GSI Maps" (Typhoon Hagibis in 2019)



Aerial photographs of Toki River, Higashimatsuyama, Saitama, after (left) and before (right) Typhoon Hagibis

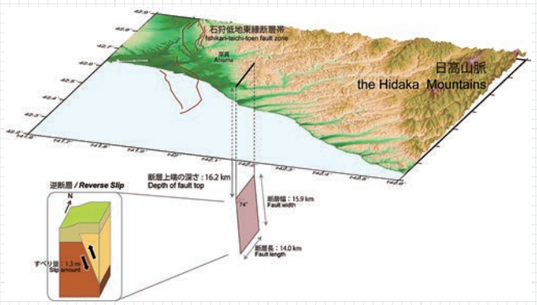
Kunikaze III, GSI' s survey aircraft, was mobilized in a temporarily good weather for aerial photography on the second day of the disaster on the basin of the Toki River, Saitama, caused by Typhoon Hagibis in 2019. Photographic data were immediately delivered to the organizations concerned, which used these photographs for identifying the damage and conducting disaster assessments before recovery of the affected areas.
Such aerial photographs are publicized at the GSI' s website and on the "GSI Maps" site which has a double screen function, useful for comparing the views of pre- and post-disaster areas. The other "GSI Maps" functions are very useful for viewers' understanding of the situation of disaster-affected areas.

Slope failures and sediment deposition (distribution map) (Typhoon Hagibis in 2019)



GSI mobilizes its own survey aircraft for emergency aerial photography and uses resulting photographic data to produce "interpretation maps" depicting topographic alterations caused by slope failure and sediment deposition.
The map on the left is a "slope failure/sediment deposition distribution map" created through interpretation of topographic alterations caused by Typhoon Hagibis around Marumori, Miyagi. The resulting data were delivered to the organizations concerned.

Estimation of seismic fault model (2018 Hokkaido Eastern Iburi Earthquake)



GSI is conducting research on modelling earthquake faults that caused tremors of the ground surface and crustal deformation during huge earthquakes, using crustal deformation observed by GNSS CORSs and changes of the ground surface detected by Interferometric synthetic aperture radar (InSAR) analyses.
The figure on the left shows an estimated earthquake fault model representing the slip on the underground rocks during the Hokkaido Eastern Iburi Earthquake on September 6, 2018. The model revealed the positions and movements of the faults and the magnitude of the earthquake. The information was provided to the Earthquake Research Committee operated by the government for evaluation of seismic activities.