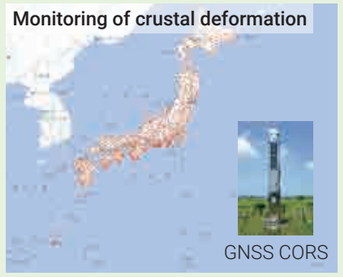
Daily operations

As part of daily preparations, maps and surveying technologies are used to observe crustal movements, and to prepare and distribute geospatial information that can also help to prevent and mitigate disasters.

Producing active fault maps

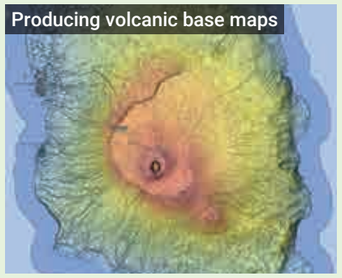
Active fault maps showing detailed locations of active faults in Japan. It is useful for earthquake disaster prevention.

Monitoring of crustal deformation



Crustal deformation is monitored at about 1,300 GNSS CORSs distributed throughout Japan.

Producing volcanic base maps

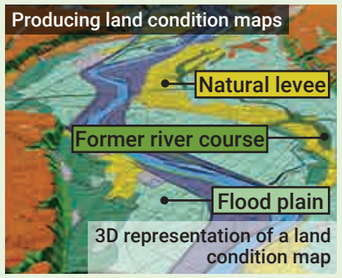


Volcanic base maps, depicting topographic forms of volcanoes with accurate contour lines and disaster prevention facilities, are produced.

Installation of REGMOS

On active volcanoes, Removable GNSS Monitoring System (REGMOS) are used to enhance observations.

Producing land condition maps



Land condition maps, which compile topographical classifications of flat areas, are useful for understanding the land's formation and potential natural disaster risk.

Natural Disaster Monuments

Information about natural disasters inscribed by our ancestors on stones and monuments is arranged on maps to pass on disaster lessons to future generations.
Showa-Sanriku Earthquake (earthquake and tsunami): Kesennuma City, Miyagi Prefecture

Updating geospatial information

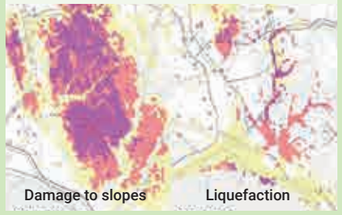
Accurate geospatial information is absolutely essential information to have when formulating disaster prevention and mitigation plans. In addition, when a disaster occurs, it can be useful for understanding the state of damage by making comparisons of conditions before and after the disaster.

Disaster Breaks Out!

Data collection / Interpretation and analysis

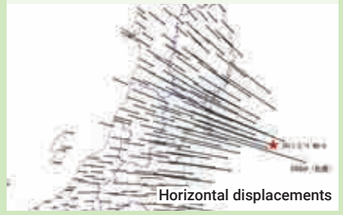
In order to quickly understand and estimate disaster conditions, information is quickly obtained from emergency photos, etc. By interpreting and analyzing various types of information, we can get a multi-faceted understanding of disaster conditions, etc.

Estimating seismic ground disasters using SGDAS (2018 Hokkaido Eastern Iburi Earthquake)



When an earthquake occurs, topographical information, estimated seismic intensity, etc., as utilized to quickly estimate the state of damage to the ground.

Crustal deformation observed by GNSS CORSs(The 2011 off the Pacific coast of Tohoku Earthquake)



The GNSS CORS network monitors crustal deformation caused by earthquakes and volcanic activities, and postseismic deformation after a large earthquake.

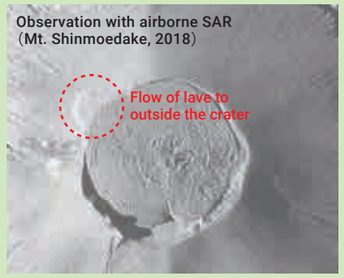
Estimating seismic fault models (2018 Hokkaido Eastern Iburi Earthquake)

Models estimated from SAR and GNSS observation data provide a precise understanding of epicenter faults.

Understanding land changes in remote islands (Nishinoshima Island, Photo taken in 2022)

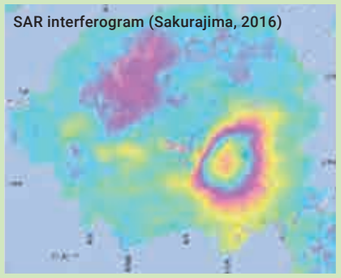
Changes in land can be understood through such techniques as aerial photography of remote islands during volcanic activity.

Observation with airborne SAR (Mt. Shinmoedake, 2018)



Observations are made of the state of crater interiors with no influence from volcanic plumes in order to understand topographical conditions such as the position of the volcanic crater.

SAR interferogram (Sakurajima, 2016)



Satellite SAR data are analyzed to identify crustal deformation caused by earthquakes or volcanic activities.

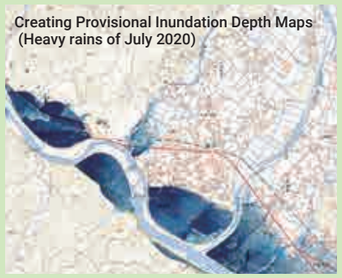
Emergency photography

Emergency photography of affected sites is conducted using surveying aircrafts and UAVs (drones) to accurately verify the state of damage.

Collecting data with SNS

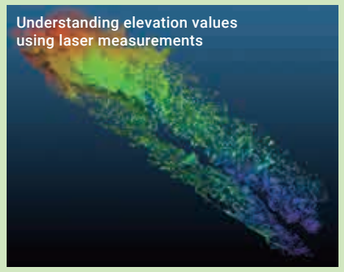
Information on the location, depth, etc., of inundation is collected from photos taken and posted during the disaster.

Creating Provisional Inundation Depth Maps (Heavy rains of July 2020)



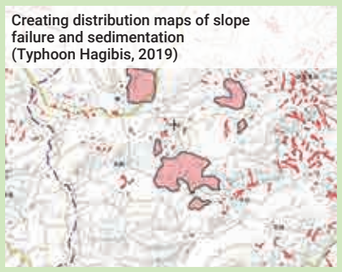
During times of flooding, SNS and other information are combined with digital elevation data to estimate the area and depth of inundation.

Understanding elevation values using laser measurements



Laser measurements are taken using drones to understand elevation values of landforms after landslide disasters.

Creating distribution maps of slope failure and sedimentation (Typhoon Hagibis, 2019)



Aerial photos are interpreted to identify topographical deformation such as slope failure and accompanying sedimentation, etc.

Information distribution

The information that is collected and analyzed is quickly distributed to relevant organizations to contribute to response work and rapid recovery.

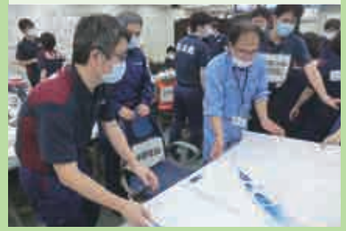
Producing/providing maps for emergency restoration and reconstruction measures (The 2016 Kumamoto Earthquake)

Detailed maps are produced and distributed after the occurrence of a disaster for use with restoration and reconstruction measures.

Revising control point survey results (2018 Hokkaido Eastern Iburi Earthquake)

Restoration surveying is conducted to provide accurate positions after a disaster to contribute to speedy recovery.

Information distribution to organizations concerned (TEC-FORCE)



Regional Survey Departments play a major role in providing acquired data and analysis results to organizations engaged in disaster response operations on site.

Drone videos of disaster areas (Heavy rains that began on 1 July 2021)

When drones are used to take video images, the images are released on GSI's YouTube video channel.