Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

HSC25-01 Room:421 Time:April 30 09:00-09:15

The reconstruction 2014 present circumstances after The 2011 TOHOKU Great Eaerthquake disaster

NISHIZAWA, Masaru[1*]

[1]none

1. Suggest the collective bargaining with the authorities concerned with the important matter.
2. I am hoping the youth for a marked conception to our country.
3. Suggest the building serves both as a residence and a place of refuge.

Keywords: The 2011 TOHOKU Great Earthquake Disaster, The building serves both as a residence and refuge, youth, Reconstruction

Japan Geoscience Union Meeting 2014
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Application of Information on Seasonal Landscapes for Landcover Classification by Satellite Data

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We cannot ignore the influence of seasonal landscapes in landcover classification by Satellite data. Therefore in the analysis, we always have to select the data acquired in the best season for available landcover classification. The seasonal landscape change is also caused by human activities as well as natural conditions. The higher the resolution of the data used for classification, the influence on the landscape by human activity increases in the results. Considering human activity on the classification, it seems that we cannot obtain the realistic image for natural conditions. We do not have much interest in the influence of classification of natural conditions induced by landcover classification based on human activity and the countermeasure. In this study, seasonal landcover classifications based on human activity are analyzed in Aso volcano with remarkable seasonal change of landscape every year. Then, the accuracy is confirmed by such as sign of human activity that can be identified in the classified images. Finally, I discuss on the influence of the classification to that of natural conditions in the volcano and show a countermeasure for the problem in the classification. We used four ALOS data acquired in spring 2010, summer 2006, autumn 2007 and winter 2007 for the classification. The study area was classified into 6 items such as green grass, withered grass, forest, arable land, urban area, open burning area by the supervised maximum likelihood classification.

On the landcover classified maps of all seasons, similar distribution patterns were observed on forest of caldera wall and piedmont of central cone, and on arable land and urban area of caldera floor. On the other hand, distribution of different items was shown in crater rim and mountainside of central cone every season. They are green grass in September, green grass, arable land and withered grass in November, withered grass in February, green grass, withered grass and open burning area in April. On the classified maps, the large seasonal landscape changes at the grassland in crater rim and mountainside of central cone can be understood. From the interpretation of these changes, signs of human activity of boundary of management association for grassland, such as firebreak of open burning were identified clearly. However, this classification work could not induce appropriate classified images that represent the natural conditions in the volcano at the summit area and crater lake area of central cone, dissected valley of lava dome and past slope failure area in caldera wall. At the summit area of central cone, I selected the seasonal image that is easy to represent the distribution for each class of natural conditions. The items in the image were reclassified into the classes of natural conditions and the values of the power of 10 were given to them. Finally, I obtained the realistic landcover classification image at the volcanic area from the overlay analysis by using the reclassified images. Consequently, I clarified in this study that landcover classification representing the characteristics of natural conditions can be performed with high accuracy by using the information of seasonal landscapes based on human activities.

Keywords: Aso volcano, landcover classification, ALOS, seasonal change, natural condition

Japan Geoscience Union Meeting 2014
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HSC25-03 Room:421 Time:April 30 09:30-09:45

Disaster information gathering depend on the geographic characteristics zone using geospatial information

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In order to build a national land equipped with resilience, it is important to advance environmental preservation, land conservation and development which performed geographic division summarized the area where the geographic characteristics is similar. The author tried to classify into the about one hundred geographic characteristics zones of Central Japan for disaster prevention.

Geographic characteristics classification from the viewpoint of the disaster prevention was carried out by the following method. First, it classified into mountain, hill, volcano, plateau and lowland by landform classification. Next, about mountain, hill and volcano, it subdivided according to geology. About plain, it subdivided according to the ratio of plateau and lowland. High-risk areas, such as slope collapse, landslide, liquefaction and collapse of volcanic bodies, were extracted from the analysis of geospatial information, including DEMs, geological maps, landslide distribution maps, landform classification maps, etc.

In this presentation, the author will discuss how to use the geographic characteristics zone for emergency assistance at early stage. It is necessary to consider the disaster information gathering according to the difference of disaster characteristics on each geographic characteristics zone. The most important issue in mountain area is grasping of an isolated colony, and detection of an isolated colony is possible by overlay of slope collapse expected area and road network information. In the viewpoint of a catastrophic secondary disaster, extraction of the flooding area by a landslide dam is very important. Satellite SAR and airborne SAR ware effective method in the case of deep collapses by the typhoon heavy rain of Kii Peninsula in 2011. In the disaster information gathering in early stages of a plain area, tsunami damage is very important. Satellite SAR was effective method for the detection and monitoring of the tsunami flooding area in the case of the Great East Japan Earthquake. From the viewpoint which carries out emergency assistance at early stage, the extraction of the heavy damaged area is required. The development of automatic classification technology about spill zone, failure zone and flood zone using polarization SAR is required.

Keywords: geoigraphic characteristics zone, geospatial information, disaster information gathering, emergency assistance at early stage, synthetic aperture radar

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HSC25-04 Room:421 Time:April 30 09:45-10:00

Towards detailed tsunami hazard assessment for specific regions

HIRATA, Kenji[1*] ; FUJIWARA, Hiroyuki[1] ; NAKAMURA, Hiromitsu[1] ; OSADA, Masaki[1] ; OHSUMI, Tsuneo[1] ; MORIKAWA, Nobuyuki[1] ; KAWAI, Shin'ichi[1] ; AOI, Shin[1] ; YAMAMOTO, Naotaka[1] ; MURASHIMA, Yoichi[2] ; MURATA, Yasuhiro[2] ; INOUE, Takuya[2] ; SAITO, Ryu[2] ; MATSUYAMA, Hisanori[3] ; TOYAMA, Nobuhiko[3] ; KITOH, Tadashi[3] ; AKIYAMA, Shi'ichi[4] ; KORENAGA, Mariko[4] ; ABE, Yuta[4] ; HASHIMOTO, Norihiko[4]

[1]NIED, [2]KKC, [3]OYO, [4]CTC

NIED began research projects regarding tsunami hazard assessment (THA) in Japan to support various kind of measures against possible tsunami attacks in future by sectors such as local governments, life-line companies, etc after the national tragedy caused by the 11st March 2011 Tohoku earthquake (Mw9.0) (Fujiwara et al., 2013, JpGU). One of the research projects is a research of probabilistic tsunami hazard assessments (PTHA) in which we consider all of possible tsunamis that may affect coastal regions in future. The research of PTHA consists of two subjects; (1) nation-wide probabilistic tsunami hazard assessment (NWPTHA) (Hirata et al., 2014, JpGU) and (2) detailed probabilistic tsunami hazard assessment for specific regions (DPTHASR). We briefly show outlines of (2) here.

The objective of DPTHASR is to bridge the gap between probabilistic tsunami hazard assessment and local measures for disaster prevention in city-scale. In the research and development process of DPTHASR, we are planning to conduct several kinds of tsunami inundation assessment for specific regions by using tsunami propagation and inundation simulations based on a non-linear long wave equation with staggered leap-flog, finite difference method (FDM) over a nesting grid system with the minimum grid size of 10 meters. As for presentation tools of DPTHASR, we are planning to present (a) inundation flow depth hazard curve (excess probability) at specified point and (b) probabilistic spatial distribution of inundation flow depth as well as we are also planning to investigate development of (c) probabilistic inundation flow velocity assessment that is closely related to tsunami destructive force against buildings, etc. and that can be directly applied to risk assessments. As the first attempt in researches regarding DPTHASR, we are investigating a probabilistic method of depth flow assessment in which both of probabilistic assessment for inundation flow depth distribution and inundation flow hazard curves (excess probability) are presented (Saito et al. 2014, JpGU).

For a high-precision forecast of inundation phenomena based on tsunami run-up calculation in DPTHASR, it is the most important to use fine and precise topographic data with detailed information on breakwaters and seawalls in coastal region and riversides. We make effort to collect these information and will have to investigate relationship between inundation flow assessment and destruction conditions of coastal infrastructures in near future. The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) of Japanese Government recommends users for tsunami runup calculation to basically use high-precision topographic data acquired with airborne laser scanning (MLIT, 2012, Guideline for tsunami inundation forecasting). The Geospatial Information Authority of Japan (GSI) is progressively releasing the precise coastal topographic data acquired with airborne laser scanning. DPTHASR will be advanced using processed data, converted for tsunami simulation, created from high-precision topographic data acquired with airborne laser scanning by GSI.

Keywords: tsunami, hazard assessment, runup, probability, local tsunami forecast, utilization

Japan Geoscience Union Meeting 2014
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HSC25-05 Room:421 Time:April 30 10:00-10:15

Evacuation passage from Tunami-map exercise with inhabitants

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At the time of the south seas earthquake occurrence, the security of the refuge course is necessary. The investigation area is Shiwagi, Minami-cho, Tokushima. We identified the evacuation route as local inhabitants in students. We had you tell local people a number and the location of the person requiring nursing care. A person requiring nursing care is an elderly person, an infant, a person with a physical disability.

Keywords: Evacuation, tunami, DIG, ?obstruction, GIS

Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

HSC25-06 Room:421 Time:April 30 11:00-11:15

The Significance of Partnership and Participatory Sharing of Geospatial Information through crisis mapping in Izu-Oshima

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1. Introduction

Various platforms enable online-based plotting of disaster information map using reviews and other social networking services (SNS). Examples Ushahidi has been noted since the Great East Japan Earthquake for its usefulness in promoting rapid situational awareness in disaster areas. This platform also is used OpenStreetMap (OSM), a free mapping project used to generate background maps. Indeed, as regards natural disasters that occurred in Japan after year of the Great East Japan Earthquake, simplified versions of information sharing sites have been established by volunteers, such as Crowdmap. Meanwhile, during the onslaught of Typhoon Wipha last October 2013, information sharing by volunteers progressed smoothly using the rapid launch of Crowdmap.

However, the method of geospatial information gathering in the event of a crisis as a means of quickly relaying information in and out of disaster areas, as typified by crisis mapping using Ushahidi, is not fully and properly utilized in Japan.This study examines the role of information sharing and the development of geospatial information on the Web related to disaster response.

2. Sharing of geospatial information by participatory mapping in Izu-Oshima

To promote Izu-Oshima tourism around the Geopark with the aid of information technology, Izu-Oshima Tourist Association and other groups held the Hackathon and Mapping Party in January 2013. In this event, a detailed map created or developed smartphone applications for leisure by about 30 cooperating participants composed of OSM developers and mappers, as well as local residents involved in geopark's tour guide.

3. Cooperation with other organizations and launch of crisis mapping during the occurrence of Typhoon Wipha

After the event in January 2013, participants continue to engage in exchanges through a Facebook group, including participants of the island nature tour guide. For instance, users in Tokyo, who tuned in to the news regarding the occurrence of heavy rain and landslides brought by typhoon Wipha last October 16, intensified their information collection and uploaded data on the Web site very quickly. Twitter accounts with high reliability, such as that of "Izu-Oshima's disaster prevention", published information picked up by disaster prevention radio stations.

In another case, the Red Relief Image Map made by Asia Air Survey and slant ortho-photo data gathered by emergency shooting by some survey companies provided as a possible WMS layer through "e-com map" of the Research Institute for Earth Science and Disaster Prevention and Geoserver of the Code for Japan community. Such geospatial information can serve as the basic data for the estimation of location information, in which Crowdmap helps screen information via SNS features. As such, the number of page views of Crowdmap reached 12,000, and 248 reports are posted on Crowdmap in about a month after the disaster. In addition, as information transfer throughout and mapping of the disaster area had become a major issue, it was reported in local as well as analog information of paper maps, such as the large-format guide to the Great East Japan Earthquake by the Nature and Tourism Association staff.

4. Conclusions

In Japan, crisis mapping that fully utilizes the Web, such as online maps, has come to be carried out quickly and serve as a source of understanding and cooperation between volunteers and various organizations. In this context, the need for information gathering and sharing at a high public degree in the initial disaster stage is recognized, triggered by the events of the Great East Japan Earthquake. In addition, even in areas where information technology and geospatial information have not been as highly developed compared with Izu-Oshima, the cases covered in this study revealed that stakeholders could work together through workshops to build a relationship aimed at advancing information sharing development.

Keywords: crisis mapping, crowdsourcing, Ushahidi, volunteered geographic information, Izu-Oshima island

Japan Geoscience Union Meeting 2014
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HSC25-07 Room:421 Time:April 30 11:15-11:30

Study of natural disasters and terrain of Izu Oshima with Red Relief Image Map

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Introduction

In recent years , advances in LiDAR technology , detailed topographic data with high accuracy by eliminating the influence of the tree is now obtained. The contour by aerial photogrammetry so far , terrain under the trees is due to the estimation of operator that assumes the tree height , the difference of the laser measurement was evident . However, it is to express in scale in which it is easy to utilization of the whole picture microtopography measurement such results is difficult. Also shaded contour plot also altitude tints Figures it was not appropriate. I ivented red relief image map method at the time of terrain reconnaissance of Aokigahara-Jukai of Mount Fuji in 2002. After that I've been used to field survey and interpretation of volcanic terrain around the country .

red relief image map

The more red than at steep slope , as bright as ridge , expressed the darker the valley , red relief image map is a some false color image of certain ortho . Since the state overlapping the topographic map , without the use of specialized equipment , it is possible to obtain a natural three-dimensional feeling in one piece , a combination of a red relief image map and LiDAR DEM and revolutionized the field survey.

terrain of Izu-Oshima

Also in Izu-Oshima , LiDAR DEM were detected, H24 by Tokyo,H25 by Tokyo ,H18 by GSI has been carried out . In addition , as the foundation map information 5mDEM, measurement results of H24 have been published from the GSI.

This section shows a red relief image map of Izu-Oshima , we describe the features of the volcanic terrain that can be read from there .

Izu-Oshima , there is a caldera in the center , Mt central cone is located in the center . Mt shows the terrain of tuff cone crater is large in proportion to size , but I'm repeating the activity in which the bottom of the crater of the central vertical hole moves up and down , to overflow the lava . The eruption occurred at 1950-51 and 1986 in recent years . In addition, in the Izu-Oshima , fissure eruption many distribution on the outside of the caldera , C fissure eruption in 1986 . It has been estimated that there is a fissure of Y5 drained the lava flow the steep slopes on the east side of Motomachi , but the exact location has not been clearly covered in trees . The red relief image map by the laser measurement of H18, Y5 fissure is visible clear , although confirmation has been difficult by many trees . After that , the field survey of the collapse can be accomplished by the typhoon disaster of October 2013 , it was confirmed to be Y5 fissure .

Features of the terrain of the surface slope collapse

The typhoon of October 16, 2013 , a large debris flow disaster occurs at the Motomachi Kandachi area of Izu-Oshima . Wake of this disaster was the collapse of the surface layer of volcanic ash on the slopes , and this slope are crossed by Y5 fissure, debris flow was flowing down over the Motomachi lava flowed from there . For the valley of this lava flow is very shallow , became the disaster spill debris flow can not swallow . In addition, I describe the characteristics of the micro-topography in the poster .

Keywords: izu-ooshima, DEM, red relief image map, lava flow, LiDAR, surface failure

Japan Geoscience Union Meeting 2014
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HSC25-08 Room:421 Time:April 30 11:30-11:45

Debris flow by Tyhoon Wipha and creating maps with flow accumulation

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1.Typhoon Wipha

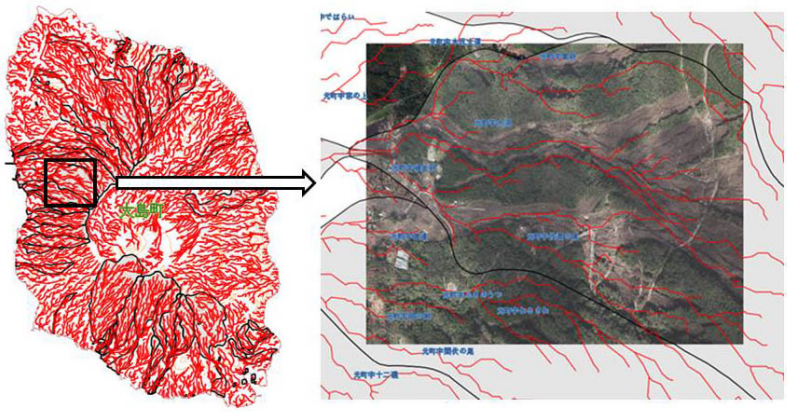
2. Flow accumulation

3. A case of Izu Oshima

4. Web Publication

5. Summary

Keywords: Typhoon Wipha, Debris flow, Flow accumulation, Web publishing, Geoserver



Japan Geoscience Union Meeting 2014
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HSC25-09 Room:421 Time:April 30 11:45-12:00

The effort of prompt information-gathering - crisis response to damages by Typhoon Wipha (2013) on Izu Oshima island

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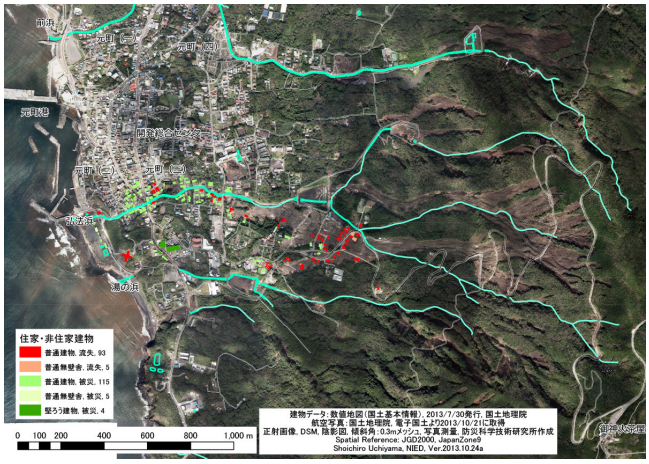
Disaster Information Laboratory (DIL) at National Research Institute for Earth Science and Disaster Prevention (NIED) integrates information provided related organizations and release to public in case of hazard strikes. This paper shows the effort of prompt information-gathering as crisis response by NIED at Izu-Oshima devastated by the typhoon Wipha in 2013.

Keywords: crisis response, information-gathering, structure from motion (SfM), typhoon Wipha in 2013, Izu-oshima



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HSC25-10 Room:421 Time:April 30 12:00-12:15

Role of the cloud based GIS for disaster management system at Emergency Operation Center

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The cloud-based GIS center with the assumption that on the basis of the lessons learned in disaster information logistic support of the Great East Japan Earthquake 2011, ICS is introduced at the provincial level, to function under ICS concepts in the field Saitama Prefecture. The object of the invention is to organize the features and to operate by implementing it.

For this purpose, the contents of this study are as follows;

1. Study of cloud-based GIS data management perspective for the basic system

2. Application to the COP(Common Operational Picture) and the study of the utilization by the cloud of electronic results

3. Demonstration and calibration in collaborative disaster drill applying the ICS

Keywords: GIS, Incident Command System, Common Operational Pucture, Information Management Process, Emergency Management Center

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HSC25-11 Room:421 Time:April 30 12:15-12:30

Micro - Landform Mapping and Applications in Hilly Area Using LIDAR Data

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The objective of this study is to develop the information to be provided for natural regeneration by investigating the relationship between Micro-Landform and vegetation in hilly area of Higashi-matsuyama City in Saitama Pref. The Micro-Landform was classified based on the conversion line of the slope angle derived from DEM (digital elevation model) generated from LIDAR (Laser Imaging Detection And Ranging). Furthermore, we summarized the classification situation of each Micro-Landform by every tree measurement. Finally, the relationship between vegetation and Micro-Landform in the study area was detected by analyzing the relationship between the summarized situation of Micro-Landform and the woody life type corresponding to the Micro-Landform classification using TWINSPAN.

Keywords: LIDAR data, Micro-Landform, Vegetation, TWINSPAN

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HSC25-12 Room:421 Time:April 30 12:30-12:45

An influence of roadway on occurrence of slope failure and debris flow of the Izu-Oshima Typhoon Wipha (1326) disaster

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[1]Tokyo Metropolitan University

Vast slope collapse took place and debris flows struck the Motomachi-town foot of western slope of the Izu-Oshima Island on early morning 16, Oct. 2013. Field survey on the collapsed slope by *TMU Group for Izu-Oshima Typhoon Wipha (1326) Disaster Survey* was carried out 4 to 6, Dec. 2013.

One of the major concerns of the authors was an influence of roadway built after 1986 eruption on occurrence of 2013 slope collapse. Results of the survey are summarized as follows, (a) Collapse points originated from downslope side of the roadway (type-A collapse) were located on ridges and adjacent to collapse points originated from upslope side of the roadway (type-B collapse). (b) A large amount of debris of fallen tree which would have been transported by mud flow on the road was observed around the type-A collapse points. (c) A 1-0.5 m thick surface soil mass with tree and its dense roots was peeled from base of the retaining wall at the other small collapse. An appearance of the base of the retaining wall at the small collapse is similar with base of the retaining wall at type-A collapse.

Taking account into these results (a) to (c), it is inferred that type-A collapse would have occurred according to the following scenario, (1) rainwater and mud flow from type-B collapse flowed on the roadway, (2) around the curve on the ridge, rainwater/muddy water fell down from road surface to retaining wall and (3) surface soil mass (1-0.5 m thick) with dense tree roots and trunks was saturated by water and peeled from base of the retaining wall. Consequently, we conclude that the roadway was not a primary factor but secondary factor of the slope collapse, which expanded collapse area in this case.

Keywords: slope failure, Izu-Oshima, Typhoon Wipha (1326), roadway