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

G02-01 Room:423 Time:April 29 14:15-14:30

Field Lectures at the Classroom sessions of The Open University of Japan

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Classroom Sessions (Schooling) of The Open University of Japan, is a good opportunity to outreach Earth Science in the context of Lifelong Learning Program. 4 field program planed and held at 3 Study Center, each program limited about 20 students to join, but there were 80 applicant in average. The student had a wide range in age and background, half of them were over 60, which belong hiking and climbing mountain lover generation, and often had knowledge about biology and other field of science. These multi dicipline field works set by biologist and geologist, is a suitable way to recognize how Earth Science is important for our life.

Keywords: Fieldworks, Open University of Japan, Lifelong Learning, Natural History

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G02-02 Room:423 Time:April 29 14:30-14:45

Geological structure of the Kanto sedimentary basin ?An analog model-

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The geologic history of the Kanto Plain, central Japan, is briefly introduced for the purpose of educational promotion of the geology and earthquake disaster prevention. Thick sediments were accumulated between Northeast and Southwest Japan during the Japan Sea opening (20-15 m.y. ago). The grabens and half-grabens were developed under extensional stress field during this stage. The topographic up-and-down structure in basement rocks was then covered by marine sediments widely from 15 m.y. until ca. 10 m.y. ago in the Kanto district. The tectonic deformation had been slight between 15 and 3 m.y. ago. However E-W contractive deformation has suddenly begun at 3 m.y. ago, and reverse-faulting and folding were started in the Japanese islands. The thick sediments below the Kanto Plain were then deformed and active faults, such as the Tachikawa Fault, were finally cut the surface. The scenario of this history is useful for interpretation of subsurface structure deduced from geophysical exploration.

Keywords: outreach, earth science, geology, educational promotion

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G02-03 Room:423 Time:April 29 14:45-15:00

Gelatin experiments on magma ascent and eruption for outreach program

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Analog experiments are useful for outreach program. We cannot see the inside of a volcano directly, though an eruption is caused by underground magma. I develop the see-through experiments to understand a process from magma system to eruption. Liquid-filled cracks are injected in gelatin under the stress field. We can examine the factors controlling magma ascent to eruption, such as density, viscosity, the physical properties of the earth, the stress field etc. I introduce several examples of the experiments: magma ascent to eruption, crack behaviors under the stress field, magma movement with bubbles, the crack interactions, two phase flows, crustal behavior in the liquid filled crack. These experiments were carried out at elementary schools, junior high schools, science museums, the open house in AIST, training course for school teachers in YIES, and lectures of university, the international training course of JICA, APEC, COV.

Keywords: outreach, volcanology, magma, eruption, analog experiment, dike

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G02-04 Room:423 Time:April 29 15:00-15:15

GANSEKI as an educational material: Application of JAMSTEC deep seafloor rock sample database

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[1]Japan Agency for Marine-Earth Science and Technology, [2]Marine Works Japan, Ltd.

On the basis of Data-Sample Handling Policies of the Japan Agency for Marine-Earth Science and Technology (JAMSTEC)[1], data and samples obtained during research cruises of JAMSTEC vessels are treated as common properties of the human community; data and samples are stored and publicized to the public for second-hand uses with research/educational purposes. After two-years of moratorium period during which on-board researchers and colleagues have a priority to use data and samples, information on data and samples are disclosed through JAMSTEC data sites, and are utilized for foreign/domestic activities of research, education, press report and public relation.

JAMSTEC vessels collect several hundreds of rocks from the deep seafloor each year. These rock samples and associated data are also subject to be publicized. Sampling information and associated data of rock samples are accessible from the website "Deep Seafloor Rock Sample Database (GANSEKI)[2]". Currently, GANSEKI exhibits information of more than 19,800 entries of JAMSTEC rock samples including inventory information of ~9,000 actually available samples, and geochemical data and literature information of JAMSTEC/non-JAMSTEC rock samples.

After the major update in 2013, minor system tuning and data maintenances have been applied to GANSEKI. Now GANSEKI is attracting general educators and students, as well as limited number of research specialists. New GANSEKI search system allows complex filters for screening samples to support various users with different purposes. Improvements on sample/thin-section photo view allow users to effective data handling using visual information.

JAMSTEC maintains several data sites other than GANSEKI. Some of these data sites are linked together so that users can utilize data more effectively. Users can come-and-go between GANSEKI and "Data Research System for Whole Cruise Information of JAMSTEC (DARWIN)[3]" to pick up rock sample information in GANSEKI and associated information in DARWIN, such as cruise/dive information, geophysical observation data, cruise reports and literature information. Rock sample information in GANSEKI is also linked to dive movies/photos in "JAMSTEC E-library of Deep-sea Images (J-EDI)[4]", and users can comfortably look into sampling scenes of interested rock samples and surrounding geology.

GANSEKI users can now access to massive online data, which are almost comparable to those provided to onboard researchers. Disadvantages for second-hand users are getting smaller and these users can perform more practical research/educational activities. GANSEKI can be utilized not only for mineralogical/petrological purposes, but also for other various purposes, such as surveys of contemporary activities in ocean geology, case studies for observation data handling or online database system, and so on.

References: [1] "JAMSTEC Basic Policies on the Handling of Data and Samples" http://www.jamstec.go.jp/e/database/data_policy.html. [2] "Geochemistry and Archives of Ocean Floor Rocks on Networks for Solid Earth Knowledge Information (GANSEKI)" http://www.godac.jamstec.go.jp/ganseki/e. [3] "Data Research System for Whole Cruise Information in JAMSTEC (DARWIN)" http://www.godac.jamstec.go.jp/darwin/e. [4] "JAMSTEC E-library of Deep-sea Images (J-EDI)" http://www.godac.jamstec.go.jp/jedi/e.

Keywords: rock sample, curation, on-line database, outreach, marine geology

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G02-05 Room:423 Time:April 29 15:15-15:30

Quaternary Scientific Programs for School and Lifelong Education of Kikai Island located in the Amami Islands, Japan

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The Amami and Okinawa Islands show active tectonics indicated by uplifted marine terraces consisting mainly of raised coral reefs. Especially, Kikai Island shows a rapid rate in uplift (reaches 1.8 m/ka) due to subduction along the Ryukyu Trench. This study arranges geoscientific contents and produces a geostory for school and lifelong educational programs of Kikai Island. The geostory focuses groundwater springs, limestone caves, uplifted terraces (uppermost surface is 214 m) and coral stones, and highlights geomorphic processes characterized by the most rapid uplift in Japan and a hydrologic cycle in the Quaternary limestone region. This geostory was repeated and practiced in half-day geotour targeting undergraduate students and residents of Kikai including high school students. Their comments suggest the significance and the interest on field observation of local landscape related with a global geoenvironmental system.

Keywords: Quaternary, limestone, geostory, geotour, Kikai Island, Amami Islands

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G02-06 Room:423 Time:April 29 15:30-15:45

Educational Approach for Risk Reduction in Himalayan Seismic Zone I -Bridging the Gap Between Knowledge and Practice-

KIMURA, Motoko[1*] ; ADACHI, Tomoyuki[2] ; HANAOKA, Naoya[2] ; TAKAMINE, Ryo[2] ; KATO, Airi[2] ; BETSUYAKU, Shoichi[2] ; ITO, Takamori[3] ; KOKETSU, Kazuki[1] ; OKI, Satoko[2]

[1]Earthquake Research Institute, University of Tokyo, [2]Faculty of Environment and Information Studies, Keio University, [3]Graduate School of Media and Governance, Keio University

How can we encourage people to take preventive measures against damage risks and empower them to take the right actions in emergencies to save their lives?

The conventional approach taken by scientists had been disseminating intelligible information on up-to-date seismological knowledge. However, it has been proven that knowledge alone does not have enough impact to modify people's behaviors in emergencies (Oki and Nakayachi, 2012). On the other hand, the conventional approach taken by practitioners had been to conduct emergency drills at schools or workplaces. The loss of many lives from the Great East Japan Earthquake and Tsunami has proven that these emergency drills were not enough to save people's lives, unless they were empowered to assess the given situation on their own and react flexibly.

Our challenge is to bridge the gap between knowledge and practice. With reference to best practices observed in Tohoku, one of which is known as "*The Miracles of Kamaishi*," our endeavor is to design an effective Disaster Preparedness Education Program that is applicable to other regions in the world, even with different geological, socio-economical and cultural backgrounds.

The two key concepts for this new approach are "community-based understanding of disaster risks" and "personal empowerment to take preventive actions." This approach requires collaboration and participation from people from diverse fields of expertise, cultures, and generations, touching on interdisciplinary areas of study including seismology, geology, community development, education and psychology.

In this presentation, we will introduce how we designed the programs and activities for disaster preparedness workshop held at a high school in the Lesser Himalayan Region in North India,under an Indo-Japan collaborative project[i], and share good practices and lessons learned from this experience.

[i]Project on Information Network for Natural Disaster Mitigation and Recovery (DISANET) http://disanet.interliteracy.info/about/?lang=e

Keywords: Disaster Preparedness Education, International Cooperation, Hazard Map Making, Workshop

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G02-07 Room:423 Time:April 29 15:45-16:00

Educational approach for risk reduction in Himalayan seismic zone II -Hazard map making workshop at a high school

KATO, Airi[1] ; BETSUYAKU, Shoichi[1] ; HANAOKA, Naoya[1] ; TAKAMINE, Ryo[1] ; ADACHI, Tomoyuki[1] ; KIMURA, Motoko[2] ; KOKETSU, Kazuki[2] ; ITO, Takamori[1] ; OKI, Satoko[1*]

[1]SFC, Keio University, [2]Earthquake Research Institute, Univ. of Tokyo

The 2011 Great East Japan Earthquake confronted us with the fact that the knowledge of science alone would not motivate someone take preventive action. This indicates that risk reduction cannot be completed only by hazard assessments but also by motivating people to take preventive action.

With the concept of ”community-based understanding of disaster risks” and ”personal empowerment to take preventive action”, we held a workshop at a high school in the Lesser Himalayan Region. The workshop consists of 2 sessions; 1) understanding the scientific backgrounds of earthquakes and disasters, and 2) hazard map making. Prior to the workshop, we carried out a questionnaire survey to high-school students about how they perceive the risk of the local hazard. After the first session, we provided about an hour of question time, and carefully analyzed what they said. Together with the answers of the questionnaire, it is strongly implied that they understood scientific backgrounds but do not have awareness of disaster and are not motivated to take preventive action.

Session-2 consists of several parts such as giving clear images of earthquake consequences, leading them to imagine each victim’s life that was broken up all of the sudden on March 11th 2011 as well as showing hot to find out and manage risks by making hazard map. The workshop was closed with their presentation that clearly shows the internal change of the participants. Many of them referred to the importance of lives such as ”Life is a precious gift to us from God. Don’t take it as a fun. And if you take it as a fun, then remember your family.”

In the presentation, we share the good practice that can be applied to other disaster-prone countries if we pay regard to the community-based understanding of disaster risks.

Keywords: disaster prevention, earthquake, hazard map

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G02-08 Room:423 Time:April 29 16:15-16:30

Educational Materials for the Community-based Understanding of Disaster Risks -Taking Advantage of four-frame Cartoon

SAITO, Aya[1*] ; OKI, Satoko[1]

[1]SFC, Keio University

One of the lessons from the 2011 Great East Japan Earthquake is that educational approach to prevent natural disasters can compensate the limitations of earthquake science and technologies. Hereinafter we call it as ”BOSAI education”. BOSAI can be translated as disaster prevention based on individual awareness of disaster risks and leading to personal empowerment to take preventive action. After the earthquake, more schools started to conduct BOSAI education, while the government had not provided schools with certain time, textbooks, and curriculum guidelines.

As well as learning how to react to protect lives at the moment, one of the goals of BOSAI education for mid-school students is to deal with a dilemma situation that may take place afterwards. We provided a BOSAI educational material to take up the situation of evacuation site to ask students how to distribute aid supply if the total number is less than that of evacuees. The educational material is made as a four-frame cartoon as follows: 1) 12 hours after the earthquake at an evacuation site... 2) Person1: ”There arrived 100 of aid supply!”, 3) Person2: ”What? We have 500 people here.” 4) Person1: ”Mmm... ”. Students have to give an appropriate line that follows ”Mmm...” Some of the answers were ”We should put a priority to elderly persons and small kids” or ”Why don’t we ask for cooperation to those who brought their own emergency supplies in their backpacks?”

Another point of great importance of this material is to let the local school teachers join and share. We asked for advice to improve the material, and collected comments and suggestions. Some said they will have another class with the improved material. They can arrange the contents to bring community-based understanding of disaster risks. In the presentation, we share the material and report good practices.

Keywords: disaster prevention, education, earthquake, tsunami, evacuation site, mid-school