Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

G04-01 Room:202 Time:May 20 09:00-09:15

The report of the International Earth Science Olympiad (IESO) in 2012 and the schedule to the 2016 Japan IESO at Mie.

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We will report the outlines of the International Earth Science Olympiad (IESO) in 2012 and next 4 years to 2016.
1) From 2007 to 2012
IESO 2007 (Korea) 7 countries and 24 students, Japan was observer
IESO 2008 (Philippine) 6 countries and 24 students, 3 silver and 1 bronze
IESO 2009 (Taiwan) 14 countries and 50 students, 4 silver
IESO 2010 (Indonesia) 17 countries and 63 students, 1 gold and 3 silver
IESO 2011 (Italy) 26 countries and 104 students, 1 gold , 2 silver and 1 bronze
IESO 2012 (Argentina) 17 countries and 66 students, 1 gold and 3 silver
2)IESO 2012(Argentina)
Application from Sep.1 to Nov.15,2011
1st Selection at Dec.18, 2011 (924 students. 52 places)
2nd Selection from March 25 to 27, 2011, at Tsukuba City.
(From 29 students, 4 special excellent and 4 excellent students were selected.)
Training 8 students,June-Sep.(correspondence course)
4 students,Aug. (3 days)
6th International Earth Science Olympiad from Oct.8 to 12,2012.
Results, 1 gold medal and 3 silver medals
Formal visit to the Ministry of Education, Culture, Sports, Science and Technology at Oct.15, 2012.
3) IESO 2013 (India)
Application from Sep.1 to Nov.15, 2012.
1st Selection at Dec.16, 2012 (1011 students. 59 places)
2nd Selection from March 24 to 26, 2012, at Tsukuba City.
(From 60 students, 10 excellent students were selected.)
Final selection for IESO at May 11-12 at Tsukuba City.
(From 10 students, 4 students were selected for IESO 2013.)
7th International Earth Science Olympiad from Sept.11 to 19, 2013, at Mysore, India.
4) IESO 2014 (U.S.A.)
IESO 2015 (Russia)
IESO 2016 (Japan) at Mie prefecture

Keywords: International Earth Science Olympiad

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G04-02 Room:202 Time:May 20 09:15-09:30

A poster ”Minerals for every home” (Ikka-ni-1-mai-koubutsu): Application, acceptance and construction work by Japan Asso

Yasuko Okuyama[1*], Satoshi Miyajima[2], Jun Aizawa[3], Junji Akai[4], Shin-ichi Kawate[5], Yasuo Kiji[6], Masanori Kurosawa[7], Ryoji Tanaka[8], Akira Tsuchiyama[9], Toshiro Nagase[10], Hiroshi Miyajima[11], Ritsuro Miyawaki[12], Takashi Yamada[13]

[1]Institute for Geo-Resources and Environment, [2]Saitama Prefectural Fikaya Dia–ichi High School, [3]Fukuoka University, [4]Niigata University, [5]Musashi High School and Junior High School, [6]Osaka Prefectural Minoo-higashi High School, [7]University of Tsukuba, [8]Sagami Central Cemical Laboratory, [9]Kyoto University, [10]Tohoku University, [11]Itoigawa Fossa Maguna museum, [12]National Science Museum, [13]Japan Medical University

A poster ”Minerals for every home” (Ikka-ni-1-mai-koubutsu): Application, acceptance and construction work by Japan Association of Mineralogical Sciences

Keywords: Science and Technology Week, Ikkani-1-mai poster, Japan Association of mineralogical Sciences, Mineral, Earth and planetary science

Japan Geoscience Union Meeting 2013
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G04-03 Room:202 Time:May 20 09:30-09:45

Establishment of a new department of natural sciences in a university

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[1]Tokyo City University

Most of Japanese private universities has no department of earth sciences. It is difficult to make a new department of earth sciences in a university as employment opportunities so restricted in earth science field that most of university hesitate to establish.

Tokyo City University(TCU), changed from Musashi Institute of Technology, has the Department of Natural Sciences in Faculty of Knowledge Engineering from 2009, the department contains 3 courses of molecular science, biological science, and earth science. First students of the department graduate in March 2013, includes 10 students of earth science course graduated.

The author will explain how to make a new department of natural sciences in a traditional engineering oriented university, and importance of getting a big picture of nature, with training of fieldworks and studying fundamental sciences. It will be a hint to make earth science more familiar to our society, to make school teachers and curators who trained fieldworks, the essence of earth science, and analytical methods, multi-media literacy.

Keywords: natural history, natural science, university, education, fieldwork

Japan Geoscience Union Meeting 2013
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G04-04 Room:202 Time:May 20 09:45-10:00

MAGDAS capacity building activities at ICSWSE

Maria Gracita Cardinal[1*], Akimasa Yoshikawa[1], Hideaki Kawano[1], Huixin Liu[1], Masakazu Watanabe[1], Shuji Abe[1], Teiji Uozumi[1], George Maeda[1], Tohru Hada[1], Kiyohumi Yumoto[1]

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The International Center for Space Weather Science and Education (ICSWSE) of Kyushu University, formerly known as the Space Environment Research Center (SERC), has an extensive array of real-time MAGnetic Data Acquisition System (MAGDAS) all over the world. In order to develop the basic space and geoscience awareness in developing countries, we conduct trainings at ICSWSE for our MAGDAS hosts from Asia and Africa with the support of JSPS Core-to-Core Program. Details of the program and activities will be discussed in this paper.

Keywords: MAGDAS, training, ICSWSE

Japan Geoscience Union Meeting 2013
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G04-05 Room:202 Time:May 20 10:00-10:15

The report of Science and Environmental Education Project, introduction of geological materials and programs.

Tsuda Kazuhide[1*], YAMAKAWA Yuichiro[1], YAMAZKI Hiroshi[1]

[1]NPO Whole Earth Institute

[Introduction]
Science and Environmental Education Project is a project originating from Shizuoka its appeal widely to the public with such as school teachers, nature guide, researchers work together with the theme of natural science development of educational content.

[Objective]
Researchers , interpreter (nature guide), and school teachers, principals different work together to consider ways of better education, both in terms of methodology, content, quality of environmental education I improved. Results are summarized as teaching materials and teaching models, implementation and development of teaching materials for leaders such as teaching in a high school in Shizuoka Prefecture, to implement such materials rental. We will send out the information widely to leverage local and websites such as television. Through these, it is to develop the human resources of the next generation environment that combines the knowledge of natural science, to contribute to the creation of a sustainable society drives out.

[Results]
We developed 12 types of hands-on materials and three models, we have carried out for a total of 23 times in 924 students in high school. According to data, we heard opinions that more fun from students and improving understanding of the origins of Shizuoka which was formed. Improvement of 20% was observed in the student’s own interest in the region, also interest in outdoor activities.
Are conducted, and other awareness-raising workshops for the general public in Ru-Ku-Ru Science Museum, conduct training sessions for teachers and workshops for social education leaders such as Geopark Guide Izu Peninsula.
This project was carried out under the Cooperation Fund grant of Mitsui & Co., Ltd. Environment Fund and regional development MiyaShin. I would appreciate it.

Keywords: Geological education materials, Educatinal programes, Interpreter

Japan Geoscience Union Meeting 2013
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G04-06 Room:202 Time:May 20 10:15-10:30

River School: The Report of Environmental Education Program on Elementary School using Aquatic Insects

Naoyuki Ohara[1*], Shouta Takeda[1], Junjiro Negishi[2], Yusuke Sato[2], Yasuhiro Yamanaka[2]

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In mountainous areas, river is one of the most approachable natural environments nearby. Community structure of aquatic insects such as mayfly (*Ephemeroptera*) and caddisfly (*Trichoptera*) provides useful information when understanding the current environment conditions of surrounding areas. This paper reports the environmental education program ”River School” using these aquatic insects, carried out at a river in Hoshino Resort Tomamu located in Shimukkapu Village (Hokkaido, Japan). The aim of this program was to broaden the perspective of schoolchildren on aquatic life and build a better understanding of regional environment. Using scientific explanation with plain language, we practiced to show schoolchildren about the relationship between aquatic insects and river. This program consisted of two parts: hands-on experience on insect-collecting and acrylic plastomount production (Part1), and an interactive classroom lecture with a short quiz session to remember part1 and presentation of completed specimen to schoolchildren (Part2).

Part1
On July 12th, we hosted 42 schoolchildren (Simmukappu chuo elementary school and Tomamu elementary school) , and provided them opportunity to collect aquatic life in the field and to produce acrylic-resin-based plastomount of aquatic insects. The plastomount was aimed to serve as remembrance of the program so that students would keep in mind about the experience. The mounting session was conducted with the guidance of graduate students. We kept them and later present them to students because acrylic resin needed over 24 hours to harden

Part2
Three months later, we brought the plastomounts to schoolchildren in both schools. An interactive short quiz session was provided to remember the first part as well as to check the level of learning from the first part. In the quiz, two graduate students played the role as Doctor Aquatic Insect and facilitator. Including live video images of stonefly (*Plecoptera*), we further expanded their interests in aquatic insects. When presenting the plastomounts, we also sent them the cards explaining the identification keys to distinguish each species of aquatic insects.

Later on, we received impression essays from schoolchildren. The essay shows that they were impressed with the wonders of aquatic insects, and be willing to better manage the rivers in Shimukkapu. Overall the program was successful achieving our aims. To improve ”River School”, the further modifications of this program are needed.

We are grateful to the supports from the town officers in Shimukkapu, Hoshino Resort Tomamu, and Hokkaido University.

Keywords: aquatic insects, environmental education

Japan Geoscience Union Meeting 2013
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G04-07 Room:202 Time:May 20 10:30-10:45

Investigation on mechanism of ”sea of clouds generation” and introduction of the results to tourists

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[1]Graduate School of Environmental Science, Hokkaido University, [2]Faclty of Environmental Earth Science, Hokkaido University, [3]Hoshino Resort Tomamu

Hoshino Resort Tomamu (located in Shimukappu, Hokkaido) is known as the spot to look sea of clouds (*Unkai* in Japanese). The Unkai terrace staring in 2005, and nowadays about 100,000 tourists come from all over the country to visit the terrace in summer. With gondola, the tourists go up there (1,088m above

sea level) and can enjoy sea of clouds easily. However, the tool for introduction of sea of clouds as scientific knowledge has not been put until now. Using the results from scientific research on the mechanism of sea of clouds, we created the place for tourists to learn. This report introduces the following two points. (1) Preparations for investigations for sea of clouds outbreak mechanism, (2) Creating the place for tourists to learn.

(1) Preparations for investigations for sea of clouds outbreak mechanism

Recently, Hokkaido University installed Meteorological observatory equipment in neighborhood of the top around 1,088m and foot of Mt. Tomamu around 580m, including weather observation every ten minutes. Furthermore, we have been photographed the cloud images with observation cameras every one minutes. However, in Tomamu district, the temperature distribution in the whole foot of a mountain at the time of the sea of clouds outbreak with the radiation fog is still uncertain. After weather observation in the Miyoshi basin of Hiroshima, it is pointed out that the temperature decreases rapidly until the foggy sea creation, and the temperature drop becomes small once the foggy sea occurs (Tanaka et al. 2000) . Therefore, to understand the outbreak extinction mechanism of sea of clouds, it is important to make temperature observation in the whole foot of a mountain of the Tomamu district. We installed temperature meters in 13 spots of the Tomamu district according to altitude. In the future, further analyzing weather observation data and the camera images data in Mt. Tomamu are needed. With these data, we are going to investigate sea of clouds outbreak mechanism.

(2) Creating the place for tourists to learn

We made ”Unkai card” that is educational tool for tourists to learn constitution of the scenery, not only beautiful scenery. For tourists to know about knowledge of sea of clouds, ”Cards deeply related to sea of clouds”, ”Cards related to weather”, ”Cards to enjoy” were made and installed on tables in Unkai terrace. Figure shows a state of the tourists to see Unkai card. In addition to these cards, we also made the cards of nature around Tomamu. It takes 13 minutes to climb up with gondola in one way, that is the reason the card was settled inside the gondola. Furthermore, to confirm the effects of the card and also for its modification, the interview at tourists in Unkai terrace was practiced in the summer on 2012. According to the interview, we received opinions such as ”there should be Unkai cards” and ”interesting”. It also has difference according to generation and the construction of the groups. For example, ”I can know about sea of clouds, and enjoyed to see the card”, ”the card which could learn kanji of the rain crown is interesting”.

Through these activities in 2012, it supports the effective aspects of Unkai card. Therefore, we are going to continue the interview of Unkai card and repeat its modification.

We are grateful to Hoshino Resort Tomamu, Ministry of Education, Culture, Sports, Science and Technology climate change adaptation study promotion program (RECCA) Hokkaido team, the Hokkaido University IFES-GCOE person for support.

Keywords: cloud sea, sightseeing, environmental education

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G04-08 Room:202 Time:May 20 11:00-11:15

As Environmental Education by Snow As a Natural Resource in Hokkaido

Chunying Yin[1*], Yuta Furukawa[1], Kazuki Nakamura[2], Yasuhiro Yamanaka[2], Daisuke Tanaka[3]

[1]Graduate School of Environmental Science, Hokkaido University, [2]Faclty of Environmental Earth Science, Hokkaido University, [3]Hoshino Resort Tomamu

Hokkaido University and Hoshino Resort Tomamu operates the laboratory for snow and ice, named Ice Lab, in Ice Village built in Winter. Shimukappu Village where Tomamu is in has the domestic lowest temperature record in this century, -35.8 oC, in Japan, and he Ice Village can be built under its cold condition. We report the following three practices in Ice Lab from December, 2011: (1) tourists‘ learning snow and cold in Tomamu, (2) the local children‘s learning through rediscovering the charming of snow and the cold, (3) our graduate students‘ practical learning though touching of the operation of Ice Lab.

(1) Tourists‘ learning snow and cold in Tomamu

We provide the experience of making a snow crystal strap shown in Photography. This strap is made by photopolymer wrapping the snow crystal and fixing it by lighting under the cold condition where no crystal melting occurs. This method is well known among the scientists, but is the first trial in the world for public people. Through the processes of handling the snow crystal by tourists, they really feel various forms and sizes of snow crystals, changes in the form of crystal falling just during thin snow cloud passing in several minutes, worst day when no good snow crystal obtained, and so forth. The experience is free charged, but a snow crystal strap that tourist can be brought back is charged, because the strap is the evidence of disappeared snow crystal that you observed by your eyes and moved by your hands as the only one in the world. The panels of snow crystal photos taken by the emeritus professor Katuhiro Kikuti from Hokkaido University, that continue the concept of Pro. Ukichiro Nakaya, who is famous for the words of Snowflakes are ”the letters from heaven”, and the professors‘ talks (Science ice-cafe) from Hokkaido University is held almost every week.

(2) Children‘s learning though rediscovering the charming of snow and the cold

As the students in Primary school and Junior high school learn the worth of local snow and the cold, we hold the activity named ”Snow School” in 2012 and 2013. Using the facilities of Ice Village that is not open in the daytime, though the activities of ”searching treasure in the snow”, ”measuring the depth of the snow””observing the snow crystal”, and ”making the snow crystal replica” , we hope the children can enjoy observing the snowfall and the snow cover and learning the property of snow. Besides, we hope that they can get to know that the snow in Shimukappu Village is connecting with the local living, and it is an important resource for water and the tourism. Then they can get proud of the local resource such as snow and the cold.

(3) For graduate students learning though internship

The students from the Course in Practical Science for Environment (PractiSE), Graduate School of Environmental Science, Hokkaido University get to learn how to discover social projects and to solve various difficulties in projects though their practical research and developing the environmental education program, based on the researches themselves. For example, as the a practical activity and research, in order to make the tourists from overseas understand snow and the cold, besides the panels in Japanese, we prepared the ones in Chinese and English in Ice Lab. As introducing to the tourists, the graduate students do the hearing investigation and then improve the display and the explanation. The interesting of the ice and snow gets to be known and the natural environment of the place with low temperature and heavy snow get to be understand during the tourism though this program. Based on the experience, we are looking forward to improve this in the near future.

We are grateful to Hoshino Resort Tomamu, Shimukappu Village and the Hokkaido University person for support.

Keywords: snow, sightseeing, environmental education, practical learning

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G04-09 Room:202 Time:May 20 11:15-11:30

Study on the information to promote the adaptation action for the climate change

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[1]Disaster Prevention Research Institute, Kyoto University

1. Introduction

The climate change measures are classified into ”mitigation” that is to reduce discharge of the greenhouse gas causing the global warming and prevent its progress, and ”adaptation” that is to reduce influence by regulating a system of person, society and economy against a rise in temperature and sea level and a change of precipitation with the climate change. The enlightenment activity for mitigation is carried out actively as measures of climate change targeting citizens. Although the investigation of adaptation is made by predominantly government, the enlightenment activity for adaptation targeting citizens is not so enough. The probable reason is that they cannot imagine the influence of the climate change concretely in the area that themselves inhabit.

It is necessary to utilize the prediction of the change in the future with climate model and evaluate risk in order to understand the influence in the area by climate change concretely. Some institutes recalculate the result of global climate models (GCMs) including mainly CMIP3 into mesh data in Japan, then database is constructed and published (ex. http://hes.dpri.kyoto-u.ac.jp/database/), the usage of these data is promoted.

On the other hand, because the prediction result of climate change is not only one, the users have no idea how to utilize these data. It is important to show the climate change prediction data that is the result of research to the users intelligibly, so that local residents promote the adaptation for the risk of climate change.

The purpose of this study is to grasp the general user’s image of the climate change and to investigate how the provision of prediction information changes the user’s recognition and adaptation behavior.

2. Viewpoint of the general user for a climate change and the prediction

The problems about the use promotion of climate change prediction data for the general user are thought following points.

-They don’t know which element and index of prediction data they should watch.

-It cannot be understood what kind of influence comes out only by having paid its attention to the meteorological data (temperature and precipitation) and index (precipitation of warm season).

-They don’t know how reliable the prediction data is.

-They don’t know how to interpret an uncertainty of prediction data.

In addition, it is thought that the adaptation of climate change for several decades is preferred to that for larger change 100 years later, which is pointed out by the recent research for the field of behavior economics. In that case, it is possible that an adaptation increasing a medium- and long-term risk is carried out as a result of regarding immediate actions as important. It is important to investigate the provision method of climate change prediction information to lead to an appreciate adaptation behavior from such a point of view.

3. Questionnaire survey

Based on these viewpoints, we carry out the questionnaire through the Internet investigation for citizens of Toyama where it is thought that the influence on farm products and tourist attractions by a rise in temperature with the climate change is large.

According to the recent meteorological observation data, snowfall between the winter seasons tends to decrease with a rise in temperature on the plains of Toyama. On the other hand, snowfall does not decrease even if temperature rises in the high altitude area. However, when a rise in temperature continues for the future, a decrease in snowfall in the high altitude area and a forward snow-melting are bought, and then various influences such as the review of the business period of the skiing area and the change of relation between water supply and demand in the rice-transplanting time could become apparent. It is vital to investigate the action of measures for the influence that is familiar to living environment not only an extreme phenomenon in order to promote the citizen’s behavior.

Keywords: climate change, adaptation, prediction information, providing information, adaptive behavior

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G04-10 Room:202 Time:May 20 11:30-11:45

Geologic history of sedimentary plains in Japan

Masaki Takahashi[1*]

[1]Geological Survey of Japan, AIST

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

Japan Geoscience Union Meeting 2013
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G04-11 Room:202 Time:May 20 11:45-12:00

See-through experiments of explosive eruption for outreach program

Akira Takada[1*], Ryuta FURUKAWA[1], Teruki OIKAWA[1], Kuniaki NISHIKI[1], Seiko YAMASAKI[1], Akinari HIROTA[1]

[1]Geological Survey of Japan, AIST

Analog experiments are useful for outreach program. We cannot see the inside of a volcano directly, though an eruption is caused by underground magma. We develop the see-through experiments of explosive eruption to observe a process from magma system to eruption. After eruption, audience can learn hazard areas for various eruption types, and the time sequence of typical eruption. (1) The first experiment is to observe the effect of bubble. This experiment has an advantage to prepare an experiment easily. A plastic transparent sheet is covered on a plastic transparent bottle to build an artificial volcano. Bicarbonate and citric acid with detergent for kitchen (BCD liquid) are put in the bottom of the bottle. Next, just after the bottle is filled up to the middle level with colored juice (or water), the cap with a hole drilled is closed. Eruption will occur with a 1m high explosive column, and change into effusive flow. We observe the process of eruption and the hazard area controlled by the topography.(2) The second is to see the effect of both buoyancy and bubble. The system is installed in a plastic bag, and put in water container. If the liquid in the bag such as a colored juice is denser than water, the liquid mixed with bubble is easy to erupt. However, only a juice-filled plastic bag without bubble sinks in the container. (3) The third is the mixed effect among bubble, buoyancy, and stress of the host material. The liquid with bubble such as BSD liquid or carbonate drink is injected into gelatin as the host material. We can cause an explosive eruption to form a funnel-shaped crater like diatreme. If the liquid injection is slow, the liquid accumulate bubble in it upper part. After bubble escapes like de-gassing, the liquid injects laterally like dike injection.(1), (2) and (3) were carried out at elementary schools, junior high schools, children, science museums, the open house in AIST (Yamazaki et al., 2013), training course for school teachers in YIES (Takada, 2012), and lectures of Tsukuba University. Questionnaire from audience after each experiment are introduced.

Keywords: outreach, analog experiment, see-through experiment, explosive eruption, effusive eruption, kitchen volcanology

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G04-12 Room:202 Time:May 20 12:00-12:15

The trial which devises how to teach geomorphology and gives interest to a geographical lesson

Kunihiro Aoki[1*]

[1]Nihon Univ.Buzan junior high school & high school

In our school, the eleventh grade student's Geography B is 4 times per week. Therefore, if a lesson is performed for one year, a lesson will finish with systematic geography. Students say study of systematic geography "is not interesting since it is rare to see the local special feature and spread by the lesson in theoretical." Moreover, there are some students who say, " It is hot that the contents of natural geography follow a term."

As a result of inquiring based on this, syllabus planning will not be formed as the item of the government guidelines for teaching or a textbook, but "The syllabus planning in the form where systematic geography and regional geography are mixed is desirable" will be said. Then, the turn learned from the last fiscal year was changed. Then, the turn learned from the last fiscal year was changed. I changed the study back of geographical feature into the item of "mining and manufacturing in the world." This way of advancing is mixing the resources and the industry, and the regional geography of system regional geography. Moreover, the contents were lightly treated about the contents of agriculture and stockraising or the city geography in the form relevant to this, and all the contents had a class in the form where the target to relate each other mutually is held up.

As a result, change was looked at by a student's thinking in study of geographical feature. The student who was performing only former "memorization of a geographical feature term" came to be able to do geographical thinking by "why that geographical feature is formed", "what kind of human activities to be seen in the place where this geographical feature is seen", etc. little by little. Moreover, it came to get interested about an earth science phenomenon, and dealt with the contents of the earth science 1 (earth science foundation). Furthermore, distribution of geographical feature was able to understand to some extent by this. Therefore, it can be considered that the local special feature carries out the lesson of distribution of mineral product resources or industrial distribution of each area. It seems that it got interested since the difference from Japan and new discovery were carried out.

One of the examples is introduced. When teaching the major landform in the world, the textbook is treating only three classification and distribution of the Craton, the old orogenic belt, and the new t orogenic belt. It is made to learn in my lesson to the reason the origin of three ground object structures, the name of resources produced, and resources are produced. Then, in order to tell how the learned knowledge is useful, an outline is described about the situation of the steel industry of U.S.'s northeast part, and the situation of the oil area of the Middle East area. At this time, only an outline is described and details are treated in the item entitled the industrial area in the world after study of geomorphology in practice. It seems that a burden becomes light since a possibility of forgetting having learned becomes low and study of new contents can be performed using the acquired knowledge shortly after seeing a student's appearance.

That is, I would like to say handling of geomorphology, and that influence good for a student's study comes out by what is treated after that in Geography B. I would like to receive an opinion at the same time it will say that the increase in geographical completion persons is also expectable, if it says exaggeratedly.

Keywords: textbook, geomorphology, regional geography

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G04-P01 Room:Convention Hall Time:May 20 18:15-19:30

Analog model of basement structure below the Osaka Plain

Masaki Takahashi[1*]

[1]Geological Survey of Japan, AIST

It is commonly discussed the difficulties on promoting the geologic results for the students as well as citizens. To solve this problem, I made three-dimensional analog model of basement structure below the Osaka Plain. The horizontal scale of model is 1/100,000 but vertical scale is emphasized as 500%. Because the model was painted by gradations in color from yellow (Shallow) to dark blue (deep), it can be easily recognized the contrast between subsurface steep precipice and gentle slope of basement structure. Among them, the Uemachi Active Fault is characterized by sharp drop of basement depth below the Osaka Plain. Thus the analog model of basement structure below sedimentary basin would be helpful to understand why long-period ground motion is amplified in the sedimentary plain such as the Osaka Plain.

Keywords: outreach, earth science, geology, educational promotion

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G04-P02 Room:Convention Hall Time:May 20 18:15-19:30

3D visualization and outreach of geological information using finely detailed miniature.

Akihiko Shibahara[1*]

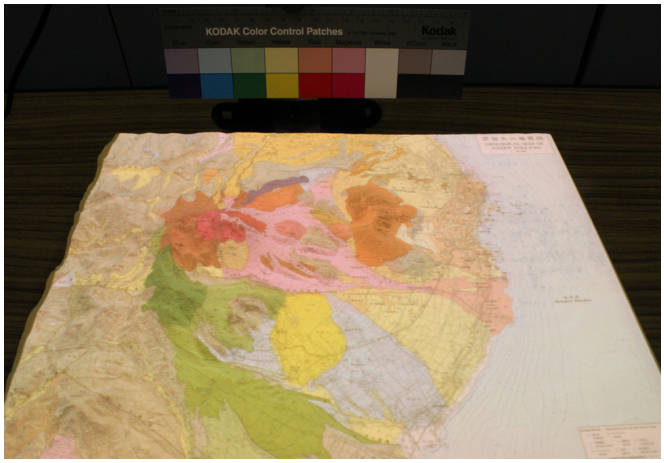
[1]Geological Museum, National Institute of Advanced Industrial Science and Technology

In recent years, people can access to geological information quickly and easily with the help of information technologies. However, it is difficult to recognize three dimensional distribution of geological structure without professional training of map reading. To solve this problem, we established several techniques to build up finely-detailed miniature. This miniature is suitable for verifying research finding, and also for outreach activities in museums, schools, geoparks etc.

To build up 3D miniature, we use 3D modeling machine called 3D-plotter and 5m-meshed digital elevation model (DEM) published by Geospatial Information Authority of Japan (GSI). A number of geological datasets, such as borehole datasets, 3D subsurface structure model published by Geological Survey of Japan (GSJ) are also used to modeling interior structure of the model. DEM are converted into 3D-CAD data format (DXF, STL, etc.) and added contour model using shape information and molded into real 3D model by the 3D plotter.

To visualize geological information, we projected geological maps, hazard maps, etc. on these 3D miniatures by optical projector. While this technique is known commonly as 3D projection mapping, we projected geological information more accurately than ever before by using projected markers. These modeling and matching techniques are patent pending (Japanese patent application No. 2012-172692). These 3D miniatures can be separated laterally into several parts to show subsurface structure. We use this miniatures to visualize geological and disaster information of Unzen Volcano, Kobe City, etc.

Keywords: Geological information, 3D model, Rapid prototyping, Projection mapping, Hazard map, Geopark



Japan Geoscience Union Meeting 2013
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G04-P03 Room:Convention Hall Time:May 20 18:15-19:30

3-D display of subducting plates and plate activity using MR (Mixed Reality)

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Recent large quantity and high quality observation data such as those provided by the nationwide dense Kiban seismic and GPS networks have contributed considerably to deepen our understanding of 3-D inhomogeneous structure within the Earth, detailed structure of subducting plates, and phenomena occurring there such as earthquakes and magma activities. 3-D display of obtained results, such as detailed configuration of subducting plates or plate activity occurring there, is essential to be properly understood by other people, and even for ourselves it is very important to understand it more deeply. Moreover, this helps to spread scientific knowledge to the public.

Based on this idea, we have been trying to develop a method of 3-D display of those images. At JPGU2012, we showed 3-D images of the detailed view of two plates subducting immediately beneath Tokyo metropolitan area and of the distribution of earthquakes occurring in the area (Kaida et al., 2012). Also, we exhibited the display using the cutting-edge image technology (Mixed Reality; MR) at RCPEVE display booth at JPGU2012. MR is a technique which seamlessly merges real images and virtual CG images in real time; it is now gaining attention as an innovative image technology. By a head-mounted display, CG image is displayed as if it really exists in front of user. Since it detects the movement of the head-mounted display, the user can see the portions that are out of sight, such as the backside and underside of the target CG. This new system has allowed us to simulate observing phenomena of the Earth’s interior with our own eyes.

With our previous contents, only space distribution display was available. However, now, we are working on the content production which enables us to see not only spatial variance but also time variation so that the spatiotemporal variation of seismic activities and crustal deformations can be displayed, through the use of AVS Express, which is a comprehensive and versatile data visualization tool, and MR system, the leading-edge image technology. In the present study, we will introduce the video contents which display the crustal deformations before and after the 2011 Tohoku-Oki earthquake observed by GPS and the interplate coupling and its co-seismic and post-seismic slips by the earthquake, along with the image of the Pacific plate subducting underneath northeastern Japan.

Keywords: 3-D display, Mixed Reality, subducting plate, plate activity, crustal deformation

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G04-P04 Room:Convention Hall Time:May 20 18:15-19:30

Education of Fuji volcano using the Waste oil experiment

Tomohiro Kasama[1*]

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Waste oil experiment (Kasama et al., 2010) can make a Polygenetic stratovolcano using waste food oils and colored sands. Fuji volcano is the most famous staratovolcano in Japan. Almost of grade schoolchildren know its name. But, grade schoolchildren who can see real Fuji volcano are very few. Education of Fuji volcano using the Waste oil experiment was practiced for understanding Fuji volcano at a grade school on the foot of Fuji volcano, Mshima, where schoolchildren always can see Fuji volcano. 47 sixth graders were divided into four or three-person 1 set of groups. A model of Fuji volcano was made by many eruptions of waste oils and colored sands on each group. The effect of the Waste oil experiment was investigated by questionnaire research. According to the answers, similarity between model and real Fuji volcano was high; alike was 98%. Understanding of development of Fuji volcano was also high; very good was 96%. In other areas, where Fuji volcano cannot be seen well, answer of very good was not so high (about 50%: Kasama et al., 2010). It was thought that schoolchildren where live near Fuji volcano have more interest in volcano than other areas, not depending on their ability. Comments from schoolchildren were obtained. Fuji volcano may have strata. Fuji volcano may change its shape by eruption. Fuji volcano may collapse. Fuji volcano has developed by many eruptions for long time. These results were obtained only from a grade school. In next year, the education of Fuji volcano using the Waste oil experiment will take place more schools in cooperation with a board of education at Mishima. Further discussion will be done.

Keywords: Fuji volcano, waste oil experimennt, grade school, education

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See-through volcano; experiments of volcanic eruption for outreach program

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We develop the See-through experiments of volcano in order to observe the inside of a volcano which cannot be seen directly, and understand the process from magma system to eruption. We present instructions for three-type experimental volcano, carried out at the open house in AIST. (1) The first experiment is to observe the effect of bubble. The See-through volcano is built with a transparent plastic bottle covered by a transparent plastic sheet. First, one pours colored juice and dishwashing detergent, then put bicarbonate and citric acid (or bubble bath bomb) into the bottle, and put a cap with pipe immediately. The pressure inside the bottle increases with bubble generating, eruption will occur with about a 1-m high explosive column, and change into effusive flow. (2) The second is to observe the effect of bubble and buoyancy. The See-through magma system is installed in a plastic bag, and is sunk with glass beads in a water container. Colored juice without bubble is denser than water, but with bubble, the juice starts to rise and erupt. (3) The third is to observe the effect of stress of the host material. For this experiment, the see-through host material is made of gelatin in a container. One injects colored juice from the hole in the bottom of the container using a siphon. We can observe the juice rises laterally like dike injection, and fissure eruption at the gelatin surface. If one changes the stress with pushing the container, the shape of the dike changes to adopt it.

These experiments are participatory, friendly to kids and adults, and favorably for also girls maybe because the experiments like cooking in the kitchen.

Keywords: outreach program, volcanology, experiment, eruption, lava flow, dike

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G04-P06 Room:Convention Hall Time:May 20 18:15-19:30

”Edible Marine Core” Outreach Program in Natural History Museum

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Museums are expected to appeal to citizens not only through exhibitions but also through academic activities such as lectures, courses, and science cafes based on curators’ research. Science cafes are effective tools for outreach activities from museums, especially when they are done interactively. We have cleared three important points for museum exhibitions or other activities: 1) move one’s body, 2) use five senses, and 3) act as someone (JSPS KAKENHI Grant Number 20605018). According to these three points, we attempted an interactive science cafe about marine cores at Kanagawa Prefectural Museum of Natural History.

Firstly, we hold a scientific lecture about marine research vessel and geological studies using marine cores. After the lecture, we provided a program to act onboard scientific researchers. Light meals and snacks were stratified in long half-cut pipes in the image of marine sediments, and participants were expected to observe and pick up their samples from ”edible marine cores” as onboard scientific researchers. This program could give deep impressions and understandings to our participants through moving their body, using their five senses, and communicating with curators and also among participants. We will develop this outreach program also for museum exhibitions, in classroom, etc.

This work was supported by JSPS KAKENHI grant number 24501279 and 24244078.

Keywords: Marine Core, Act Program, Earth Science Education, Outreach, Science Cafe

Japan Geoscience Union Meeting 2013
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G04-P07 Room:Convention Hall Time:May 20 18:15-19:30

A new attempt of field lesson in geological Sites - Introduction of activity of ”Geo Education” in 2012 -

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We started up a new project ”Geo Education” in 2012. This project purpose is awareness enhancement for geo-scientific education in elementary and secondary level through field excursions. In other words, it is the knowing the earth by touching and seeing the real. The members consist of scientist, engineer, teacher and university students specialize in earth science. It is probably new activity which preparess the operation methods and the instructor cooperation with the school.

In 2012, we held the field excursions with two junior high schools in Tokyo. In spite of free-choice for the participation, the number of attended studend reached around 100. From the results of questionnaire in one of the fields, it is clear that such excursion has effect for boiling the interest in student.

In this presentation, we will introduce our project ”Geo Education” and report the results and problems.

Keywords: elementary and secondary education, living lesson, field execursion, geoscience, awareness

Japan Geoscience Union Meeting 2013
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G04-P08 Room:Convention Hall Time:May 20 18:15-19:30

Science Cafe focused in Earth and Planetary Sciences - Report and agendas -

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Science has various interesting fields, especially Earth and planetary sciences which cover Geology, Seismology, Climatology, Astrobiology and so on. Therefore, Earth and planetary sciences are one of the most important and famous academic discipline, however, it is difficult to say that the attractions, essences and familiar examples of Earth and planetary sciences have become widespread in the public eye. One of the reasons for this is that the scientists study the phenomenon on an unfamiliar timescale of tens of thousands of years in Earth and planetary sciences. In addition, there are only a few opportunities for general public to meet and talk with the scientists directly. In order to settle this problem, academic communities need to understand the science mindset is not public mindset and we need better science communication to the general public.

We have proposed that science communication is the one of the best way to become interested in and understand about Earth and planetary sciences for general, and also the way to promote communications between academic communities and the general public. On the other hand, much science communication is performed nowadays. But in the current situation, almost all of the activities aim to enlighten people who are usually not interested in science about the interest of science. The aim is very important, but not enough because the interest for sciences or scientific knowledge is different from understanding science and being able to contribute to society. Hence, it is hoped that the current status will improve.

We established the concept of science communication in Earth and planetary science presented in JpGU 2011 (Chiba et al., 2011) and reported the results of ”Chikyu wakusei kagaku bar (and cafe)” in JpGU 2012 (Chiba et al., 2012). ”Chikyu wakusei kagaku bar (and cafe)” is the science cafe focused on earth and planetary sciences held by our science communication group, ”Universal Earth”. In this presentation, we report the characteristics and problems with the comparison of the last three science cafes whose themes were as follows; the risk of sector collapse, deep geological depository, and global paleo-environmental change indicated with Antarctic geology. Also, we suggest how an outreach activity for Earth and planetary sciences can be promoted from the viewpoint of the science cafe by Universal earth.

Keywords: Earth and Planetary Science, Science Cafe, Science communication, Discussion

Japan Geoscience Union Meeting 2013
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What is needed to evaluate the outreach of geoscience?

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NUMAP(Nagoya University Museum Activation Project) is a group of students and young researchers of Nagoya University, whose mission is to carry out activities related to science communication. We have conducted survey researches about participants of each event to evaluate the effect of our activities in an objective way. In May 2012, we did a survey on a star party for the annular eclipse. In this presentation, results of its survey will be presented and evaluation methods of science communication events will be discussed.

Keywords: outreach, science communication, survey research, evaluation, annular eclipse

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A pen-and-paper game to study uses of geothermal energy

Keiko Mizugaki[1*], Mayumi Yoshioka[1], Norio Yanagisawa[1], Youhei Uchida[1], YASUKAWA, Kasumi[1], Keiichi Sakaguchi[1], SAWAKI, Takayuki[1], FURUSAWA, Midori[1]

[1]Institute for Geo-Resources and Environment, AIST

A simple pen-and-paper game was developed to study various uses of geothermal energy. It was planned to be good for schoolchildren.

In this game, players act as the president of a geothermal development company. The game procedure is as follows:

1. First, the player draws a folded card from a box. A temperature value between 15 and 300 degree centigrade is printed on the card and this means his/her company drilled out geothermal fluids of this temperature.

2. Then the player receives the game sheet on which various geothermal uses, such as power generation, green house, house-heating etc., are printed. He/she should choose and mark suitable use(s) for the hot water of his/her company under guidance of the staffs. The player can choose multiple uses including cascade use, and can add the player's own ideas of utilization of the hot water.

3. The game is finished by stamping a mark "Excellent / Good / Nice effort" on the game sheet. The player can bring the game sheet home, and look at it again. A simplified illustration of geothermal system is also printed on the game sheet to help understanding of geothermal utilization.

Keywords: outreach, pen-and-peper game, geothermal energy

Japan Geoscience Union Meeting 2013
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Activities of the IUGS-IFG and GIN - The Applications of Geology to Help Investigate and Solve Crimes -

Ritsuko Sugita[1*], DONNELLY, Laurance[2]

[1]NRIPS, [2]IUGS-IFG Chair

'Forensic Geology' (also known as 'Geoforensics' or 'Forensic Geoscience') is the application of geology to criminal investigations. Forensic geologists may assist the police in some types of crimes to help determine what happened, where and when it occurred, or to help search for homicide graves or other objects buried in the ground. In a law enforcement context, geoforensic specialists may support the police in two broad fields of geoforensics, (a) Geological (trace) evidence, and (b) search.

Geological (trace) evidence. This involves the collection, analysis, interpretation, presentation and explanation of geological evidence. Geological trace evidence can vary considerably and may include for example; rock fragments, soils and sediments, which occur naturally in the ground, artificial (anthropogenic) man-made materials derived from geological raw materials (such as bricks, concrete, glass or plaster board), or micro-fossils. These may be transferred onto the body, person or the clothing of a victim or offender. The huge variability of rocks and soils, particularly in the United Kingdom, is helpful in potentially placing an offender or item at a particular location.

Search. Some geological techniques may be used to help the police search for locating (and sometimes the recovery of) objects buried in the ground, including for example, homicide graves, mass graves related to genocide, weapons, firearms, improvised devises, explosives, drugs, stolen items, money, coinage and jewellery.

In February 2011, the International Union of Geological Sciences Initiative on Forensic Geology (IUGS-IFG) was established, aiming *'to develop forensic geology internationally and promote its applications'*. IUGS-IFG and the Geoforensic International Network (GIN) are organizing and helping activities internationally on academic meetings as well as outreach and training programs on forensic geology.

The principal objectives of the IUGS-IFG are to:

1. Collate and disseminate data and information on forensic geology applied to policing and law enforcement, criminal, environmental and civil investigations;
2. Promote international meetings, seminars, conferences and training;
3. Develop a 'Committee' to act as principal advisers, collaborators and active participants;
4. Develop an international network whereby each 'member' will act as a principal contact in their respective country for the collation and dissemination of information on forensic geology;
5. Collate, make available and where appropriate review any existing documentation and publications in forensic geology; and
6. Produce a document endorsed by the Committee to be called; *'A Guide to Forensic Geology'*.

Details of IUGS-IFG are available from web site: **http://www.forensicgeologyinternational.com**

Keywords: forensic geology, geoforensics, forensic geoscience, IUGS-IFG, search, geological trace evidence

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An implementation report of ”the 2012 Geology Day event in BETSUKAI of eastern Hokkaido”

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In this poster presentation, we want to report of planning and implementation about our event entitled ”The Geology Day event in BETSUKAI 2012”. We planned a geo-tour for Betsukai residents as ”Geology Day” event in 2012 because we wanted residents to re-confirm the familiar landscape around the town as geo-sites. In this case, Betsukai museum was implemented as our host of this outreach event.

Before geo-tour on November 3, 2012, we gave three general lectures, ”A history of Konsen Plateau” presented by Arita, ”Gifts of earth around Betsukai- Especially hot spring-” presented by Nakagawa and ”Diastrophism understood by reading from coastal topography around Lake Furen-ko” presented by Nanayama.

After these lectures, the bus went to Gakkarahama beach in Nemuro.We participated in making pealing work of tsunami deposits with the observation tsunami deposit in the Gakkarahama beach. Then we made large peel sample of the tsunami sediment for the educational institution presentation in Betsukai museum.

Keywords: Geology day, Geo-tour, Furen Lake, Hokkaido Remarkable Geosites 100, Tsunami deposits, peel sample

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Investigation of damage trace of the 2005 Fukuoka Earthquake

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After the disaster of 2011, the existence such as the monuments which ticked away the teaching of the ancestor who conveyed a disaster was performed a close-up of in each place. The history of the past valuable teaching and disasters such as monuments might be forgotten with time. Therefore, it is an opportunity to raise disaster prevention awareness to convey history of disaster and a disaster sign.

We investigated the damage trace of the earthquake of the Fukuoka northwest offing in 2005. We surveyed in 23 sites, we was able to confirm the damage trace of the earthquake concerned in 8 sites. And we made the map which could take a walk through these damage traces.

Keywords: 2005 Fukuoka Earthquake, Trace of earthquake disaster, Walking map