

Japan Geoscience Union Meeting 2011

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O022-P01

Room:Convention Hall

Time:May 23 16:15-18:45

Reconstruction of the environment of maximum Wurm of Shirataki regeon in Engaru Town, Hokkaido

Takao Oka^{1*}, Takayuki Kato¹, Mayuko Yonejima¹, Tomoaki Iida¹, Yaeko Igatashi², Makoto Kumagai³

¹Earth Science Co., Ltd, Japan, ²Institute for Paleoenvironment of N.R., ³Engaru town office, Hokkaido

The main scientific theme of Shirataki Geopark is the explanation of 2 to 3 Ma volcanic activity concerned with obsidian and the use of it by peoples. The Shirataki Obsidian is of common knowledge as material of paleolith, and had been studied minutely in archaeology. On the other hand the reconstruction of the environment of maximum of Shirataki region had not been tried in the period of about fifty years after the Association of Scientific Collaboration for Shirataki Region and M. Kounoya et.al studied topography and geology of the region. We will lecture on the reconstruction of the environment of maximum Wurm of Shirataki region revealed by 14C-dating and pollen analysis with sedimentary facies analysis linking the promotion of geopark in Engaru Town.

Keywords: geopark, maximum Wurm, pollen analysis, 14C-dating, Paleolithic age, Shirataki

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O022-P02

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The highlight of SHIRATAKI geopark and trying to prepare the guidebooks for a guide of geosites

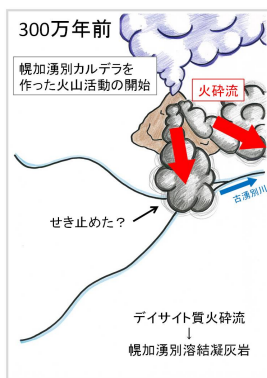
Mayuko Yonejima^{1*}, Takayuki Katoh¹, Takao Oka¹, Keiji Wada², Makoto Kumagai³

¹Earth Science Co., Ltd. JAPAN, ²Hokkaido Univ. of Education, Asahikawa, ³Engaru town office

In 2010 SHIRATAKI geopark were designated for a Japanese geopark.

There are plenty of geosites covering a story of long geological time periods. A main theme is "Obsidian" (including archeological heritage), and the minor themes are a story of geological history, tectonics, environmental change....

We have been trying to prepare the guidebook to a few model courses. One of the courses is "Shiyubetu River course". We report the process of preparing the guidebook in case of this course.



Keywords: SHIRATAKI geopark, obsidian, guidebook

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O022-P03

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Report on elementary guide training program in Mt. Apoi geopark

Toshio Kurumada^{1*}, Takumi Harada¹

¹Mt. Apoi Geopark Promoting Council

We report the purpose and the problem of the guide training program in Mt. Apoi geopark.

Keywords: Samani town, Mt. Apoi, Geopark, Furusato-Geo-Jyuku, guide training

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O022-P04

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Toya Caldera & Usu Volcano Global Geopark Guide

Tadahide Ui^{1*}, Hiromu Okada¹, Nizaemon Kagaya², Shinobu Ando², Akiko Watanabe¹, Tatsuro Hirota¹

¹CeMI, ²Toya Caldera & Usu Volcano Meister

Publication of official route guides for Toya Caldera & Usu Volcano Global Geopark has started. Authors are scientific advisors of the Geopark and Usu Volcano Meisters. Contents of each volume are brief description of geo-points, a route map, some topics and glossary. Technical staffs of NPO CeMI performed design and editorial works. Each volume is full-color, A5-size and 32 pages. Listed price is 200 yen each. The following volumes are now available at the Toyako Visitor Center and some hotels.

Vol.01 Yosomiyama Trail

Vol.02 Konpirayama Trail and 2000 Eruption Memorial Park

Vol.03 Trail at the western foot of Nishiyama

Vol.04 Usu Somma Trail

We plan to publish further volumes on the other geosites, introductory volume of the entire Geopark and English version of each volume.

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Earth studies as a part of consistent education program through elementary, junior high and high schools in Shikaoi Town

Youji Funakoshi^{1*}

¹Shikaoi elementary school

The "Earth studies" is one of the main frame of domestic education program through elementary, junior high and high schools in Shikaoi Town. We will present the history and case sample of out-door education programs corroborating with nature-guides in Shikaribetu lake.

O022-P06

Room:Convention Hall

Time:May 23 16:15-18:45

The Oga Peninsula-Ogata Geopark Plan

Hirokazu Takeuchi¹, Tateo Shiraishi^{1*}

¹Oga Pen.-Ogata Geopark Promotion Council

The stratigraphic succession of the Oga Peninsula is regarded as the standard section of the Neogene of the inner Japan arc and records the 50 million year geologic development including the break up event of the Japan Sea. Ogata-mura is founded half a century ago on the reclaimed lake bottom of the Hachirogata-lagoon and carry out large scale agriculture on fertile lake sediments.

These areas are experiencing great shortening deformation under compressional stress regime in the Quaternary. Three types of Quaternary volcanoes (Toga, Megata, and Kampu volcanoes) were formed and younger formations were highly deformed. Late Pleistocene marine terraces of the Oga Peninsula and underground geology of the Hachiro-gata lagoon record ongoing uplifting and subsidence respectively.

Active crustal movement has caused many disasters on the people. Many lives were lost by the Tsunami and ground failures occurred by liquefaction generated by the Nihonkai-chubu earthquake of 1983. Moreover, earthquakes directly above their focus had produced great damage in 1939 and 1810.

On the basis of these characteristics of the Oga Peninsula and Ogata area, we work out a detailed design for our Geopark as a theme park where people will meet following three stories; 1) geologic development, 2) interrelationship between ground and human on it and 3) gifts supplied from the earth.

Keywords: Oga Peninsula-Ogata, Geopark, Neogene geologic development, Recent crustal movement, Seismic disaster

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we are supported by a gift from the earth -yuzawa city geo park plan-

makoto numakura^{1*}

¹yuzawa city geo park conference

The city of Yuzawa, Akita Prefecture.

We would like to join the world of Geoparks Network and We will introduce the concept of Geoparks Yuzawa.

Yuzawa City has a lot of gifts from the earth and the site of hot springs and geothermal and mining.

O022-P08

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Shimonita town trying for Geopark

The council of geopark¹, yasuyuki kanai³, hideo suzuki², Tomohiko Sekiya^{2*}

¹The council of geopark Shimonita, ²The Shimonita town board of education, ³The council of geopark Shimonita

1) The central Sanba River metamorphic rocks and the Chichibu Meso-Paleozoic stratum, which continues along the central line to Kyushu.

2) The Nenashi-Yama (rootless mountain) Group includes Atokura Krippe, which was selected as one of the 100 most important geological phenomena in Japan.

3) The Shimonita Tectonic Line has a rich geological structure that is said to hold the key to explaining the process of the Japanese archipelago's formation.

4) Motojuku Cave in Saimoku formed around 900 million years ago.

5) The magnificent projection of the Kanto Loam Stratum's top lies 10 meters deep and an impressive 200 meters wide.

Many of Shimonita's geological phenomena are concentrated within a circumference of 10 kilometers, so you observe everything within a very short distance; there is no place in the world that you can see these phenomena other than Shimonita.

In addition, Mt Myogi and Mt. Arafune are very odd and uniquely shaped mountains. Even if you do not know much about geology, you can simply enjoy the experience of hiking these distinctive structures and viewing the exceptional scenery.

In Gunma Prefecture, there is a popular card game called Jomo Karuta that highlights Shimonita's internationally famous products such as negi (Japanese green onions) and konnyaku, as well as its wealth of tremendous mountains and geological formations.

Recently, Shimonita Town has been expanding PR efforts based on the slogan "Negi and Konnyaku Geopark".

From April 2010, the Geopark Implementation Committee will expand its central headquarters into the old Aokura Elementary School. In the future, all questions that people have about the Shimonita Geopark can be directed to the committee at the Aokura headquarters.

Until now, Shimonita Town has been a very interesting and fascinating place only

between geological researchers and their staffs, but now the town wants to promote and explain these magnificent places to the general public by making a plan to train Shimonita locals to be guides for visitors and by creating events that everyone can easily participate in and enjoy. The whole town of Shimonita is very excited about the potential of getting UNESCO Global Geopark recognition.

Keywords: Geopark, shimonita town, Krippen

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O022-P09

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Development and utilization of geological information in Ibaraki Prefecture -Application for North Ibaraki Geopark plan-

Taiki Kobatake^{1*}, Chiho Saito¹, Haruna Takimoto¹, Kaori Zushida¹, Jun Hosoi¹, Ibaraki University Geological Information Utilizing project team¹

¹Environmental Sciences, Ibaraki Univ.

Geopark is a nature park with important scientific inheritance and has been famous as the resource for scientific sightseeing in Japan. There are 14 Geoparks(JGN) in Japan in January 2011. The activity of the construction of Geopark is growing and the locations of it will increase in the days ahead. North Ibaraki area is one of them. The Ibaraki University Geological Information Utilizing Project, which has been established in 2007, is composed mainly of the Ibaraki University students. We have made 14 "Geological Sightseeing Map" and "North Ibaraki Geological Point Map". These maps are very useful for geo-tours. Now, our project is working as a member of the committee of the North Ibaraki Geopark Plan.

Keywords: Ibaraki Prefecture, Geopark, geotourism, regional development

O022-P10

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Chichibu basin.Peculiar climate in which it draws close to various geological features

Ken-ichi Yoshida^{1*}, satoshi miyagi¹

¹The Chichibu Geopark Promotion Council

The Chichibu area is located on the eastern edge of outer zone in Southwest Japan. Neogene system and Quaternary system are piled on the bases of Sanbagawa belt, Chichibu belt, Shimanto belt and Sanchu graben. During the Miocene era, Chichibu was covered with the sea that stretched out to the east and marine sediments were piled up. Presently the east side was upheaved, and the mountains of Sanbagawa metamorphic rocks emerged from deep down underground. Chichibu was isolated from the Kanto plains.

Magma intrusion to the west caused contact metamorphism to limestones, etc. of Chichibu belt. This inheritance of the earth supported the living of the people in Chichibu.

Chichibu's basin is a big factor to brew the original climate of Chichibu.

The location of Chichibu affected the life of people there. Chichibu is near Edo or Tokyo. Many people engaged in forestry and the fuel industry for the city of Edo or Tokyo, and iron, limestone, and silk supported the living of people. Now a lot of tourists visit Chichibu as it is one of day trip spots from Tokyo.

Because of this, the modern geology of Japan chose Chichibu as the first field. Sedimentary rock, igneous rock, and metamorphic rock exist, and it provides with material that shows Palaeozoic, Mesozoic, and Cenozoic. It is a good field for the researchers and the students who research or study Geology because they can observe a basic element of Geology. This is why they call Chichibu "The Cradle of Geology in Japan".

For a long time, Iron deposit and limestone have been very important provisions for the people in Chichibu. Chichibu is beginning to change. Profound and huge industries are declining. Things that never used to be reflected are now in the spotlight. Phloxes of Hitujiyama hill, irises of Ryoukami, icicle of Ohtaki and autumn tints of Nakatugawa, etc. are healing a lot of people's hearts and minds.

Maples that survive in steep geographical features of Chichibu belt. Buildings where mulberry and silk are recalled. Ruins of Chichibu mining companies. Stone images made from stone of Chichibu. They are still valuable existence now. A lot of NPO groups are established, and the approach to satisfy a new demand is developed everywhere.

The Chichibu Geopark Promotion Council acts as a pivot of the movement. The catchphrase is "Geopark Chichibu." One city and four towns and related groups of NPO added the element of Geo to past activities, and they started new ones.

We considered how to make many people understand the feature of Chichibu Geopark. So we make posters and billboards plainly. Also we always thought as "12 year old kids can understand our posters and billboards."

- The relation between various geological features and geographical features is understood at one view.
- We represent geologic time "About ** years ago." Only few people can understand relative age.
- Geo site is the place where the minimum security precaution is needed.
- Minimum English is used.
- Even after the recognition of Geopark, we kept the possible design in our minds.
- We avoid introducing the fossil collection places.
- We made the A4 edition of the same design as the poster. The meeting of each group was printed on the table, aiming at its popularization.
- The supplementation explanation pamphlet is made.

The Chichibu Geopark Promotion Council was established in 2011. Various activities have been done since then. Poster making, paying for signboards, developing school education ..summary signboard installation.. old, and geologic excursion, etc. the special official arrangement, training association lecture meetings, and advanced inspected geopark..



Keywords: Chichibu, various geological features, basin geographical features, the cradle of geology, Chichi belt

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Aiming to gain the Golden-spike to Tabuchi outcrop -Consolidation and preservation of the type section proposed-

Nobuyuki Aida^{1*}, Council for Certifi. of Chiba Geopark²

¹Omigawa Senior High School, ²Theoretical Study Center for E.P.M.G.

1.preface

Council for Certification of Paleo-Kanto Great Depth Submarine Basin Geopark was organized in December, 2009 at the mother's body in the Association for the restoration of Ikedea-no-ike .The business which was done first is the consolidation and the preservation of the outcrop of the title.

2.Stratotype and Golden-spike

The rivet of the gold which is called Golden-spike from IUGS is struck by the international stratotype. The Lower-Middle Pleistocene boundary can readily determinrd on the basis of the Matuyama-Brunhes magnetic polarity reversal (B/M boundary),and the stratotype isn't yet decided. The candidate sites sre two outcrops of Italy and Tabuchi outcrop on the River Yoro right bank of Ichihara City. At Tabuchi outcrop, the Byakubi (TNNT) volcanic ash is in the about 1 m higher rank of the B/M boundary. The base of this Byakubi volcanic ash layer is proposing with the Lower-Middle Pleistocene boundary.

3.Efforts to have paid to the authorization of stratotype

The following efforts were accomplished. 1)The seminar with twice and the briefing to the local community were done. 2)It made an outcrop name " the stratum in the geomagnetic field reverse period " and it installed an explanation signboard (October, 2010) (It establishes an English bulletin board in January, 2011). 3)It installed a guideboard in several places of the roads from the parking lot to the outcrop. These are a coagency with local Tabuchi neighborhood association. 4)An international symposium was hosted in Ichihara City on January 15-16th, 2011. We had the opinion that Chiba section is better than two Italian sections from two inviters.

4.Aiming to gain the Golden-spike to Tabuchi outcrop

If Golden-spike is struck by Tabuchi outcrop, to be useful for the activation of the area as the base of the sightseeing is sure. In the future, it plans to service as the Geosite. There is concerning in the Ikeda-no-ike and Tabuchi together with Ichihara City, the key word is Paleo-Kanto depth Submarine Basin. The state of the change from the forming into the present becomes one tale, and stories of the tale can be visited at the Geosite in each place in Boso peninsula. It plans to proceed with the service of the continuing Geosite at Tabuchi and Ikeda-no-ike.

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Design of Hakone Geopark

Daiji Hirata^{1*}, Secretariat of Hakone Geopark promote meeting²

¹Kanagawa Prefectural Museum (NH), ²Hakone Geopark promote meeting

Hakone is a famous sightseeing area in Japan, located in the western part of Kanagawa prefecture. Tourists can enjoy volcanic sceneries and hot springs, the nature such as creatures and the venerable history and culture. More than 30 million tourists visit from Japan and foreign countries every year.

Local governments of Odawara-shi, Hakone-machi, Manazuru-machi, Yugawara-machi and Kanagawa prefecture, have promote Hakone Geopark design. There is the area of the 254 square kilometers, and the population is about 250,000 people. Hakone volcano with wealthy nature and the neighboring area with the venerable history / culture are good for a geo-park. In addition, as a place of activity and the geo-tourism contributing to education based on Hakone volcano.

Sightseeing Promotion: Rediscover a local attractive geo-site while considering maintenance.

Local promotion: Planning local promotion of the inhabitants participation.

Education: The creation of the place of the local general learning.

We aim at the Japanese Geopark authorization of August, 2012. Therefore we establish the Hakone Geopark Promotion Committee in April, 2011 and devises basic plan and enforcement plan.

Keywords: Hakone volcano, Geopark, local education, sightseeing promotion, local promotion

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Volcano gifts from the south: conception and preparation for the Izu Peninsula Geopark

Masato Koyama², Mitsuhiro Hida^{1*}, Motoyasu Ueta¹

¹Ito City Government Office, ²Shizuoka University

The Izu Peninsula, located on the northernmost tip of the Philippine Sea plate, is a terrestrial part of a volcanic massif (Izu block) formed by the subduction of the Pacific plate. The Izu block drifted by the northward motion of the Philippine Sea plate and collided with Honshu at about 1Ma. After the collision, terrestrial volcanoes continue to erupt and active crustal movements deform the topography of the Peninsula.

On March 28, 2011, 7 cities and 6 town offices, Shizuoka Prefecture, tourist associations, branches of national administrations, and local NPOs organized the Izu Peninsula Geopark Council and started to prepare for the establishment of the Izu Peninsula Geopark.

The main theme of the Izu Peninsula Geopark "Volcano gifts from the south" consists of the following five subthemes: (1) A volcanic massif drifted from the south and collided with the Japanese mainland, (2) Geological basement originated from submarine volcanoes, (3) Large terrestrial volcanoes after the collision, (4) An active monogenetic volcano field and crustal movements associated with ongoing accretion, and (5) Local society and culture developed by the geological benefits and disasters.

The Council is preparing various items such as geosites, seminars for geoguides and general residents, textbooks and leaflets, and geotours.

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How did Global Geopark change Itoigawa municipal museum?

Hiroshi Miyajima^{1*}

¹Fossa Magna Museum

INTRODUCTION

Fossa Magna Museum (FMM) in Itoigawa is the municipal museum opened in April 1996. Geology of Itoigawa, discoverer E. Naumann of Fossa Magna, and rocks, minerals and fossils from the world are displayed in the museum. A visitor from opening exceeded 940,000 people.

The FMM played an important part with the education and the sightseeing in Itoigawa. Moreover, there were some discoveries such as new species fossils and four new minerals by curators. The FMM is the kernel facilities of the exhibition, education, research, and strage of geological specimen of Itoigawa geopark (IGP), too. Changes in the museum by the promotion of geopark will be reported.

EXHIBITION

English commentary plate has been added. A voice guide was handled newly and it made explanations by Japanese, English, Chinese and Korean. A multi purpose exhibition room was moved to the exhibition room only for the geopark. It can get fundamental information about the IGP and the geotour in this room.

EDUCATION

The outreach lecture was begun instead of lecture in the FMM. Local information was increased in the lecture, and a topic except for the geology was included, too. There were more participants than a lecture in FMM. It could get interesting information from the person living for many years by the lecture outside the FMM. Geology hiking was renamed in the Geotour, and not only geology but also creatures and cultures learned in the Geotour. The skill of the curator's explanation improved by many outreach lectures and the Geotours.

VISITORS

It increased to 59,591 people in 2009 though visitors in the FMM were 46,411 people in 2008. This is a big increase of 128% compared with the previous year. It expects that the visitor in 2010 is almost the same as 2009. This increase might be an effect of Geopark and ETC discount in expressway.

MUSEUM SHOP

The museum shop of FMM was extended in 2008 because sales of the mineral, fossil specimen and natural stone accessories were good. However, it was told that the GGN inspectors were prohibiting selling of geological objects in the FMM when the IGP was examined in July 2009. The shop income in 2010 decreased from the previous year for about six million yen as of the end of January in 2011 because it had stopped sales of the specimen. Sales decreases of specimens are too large though various commodities that did not violate the rule of GGN in the shop were newly introduced. It is necessary to make an effort to the development of suitable commodities for Geopark. Because sales of the jade from Itoigawa were traditional, the permission of GGN was obtained.

Even if it is a specimen for the education and the research, its sales are not admitted in GGN. However, a genuine specimen of the fossil and the mineral increases the interest in earth sciences for children. It influences the personnel training as there is a person who became a specialist because of the specimen and the collection, too. It is difficult to tell the feeling of quality of the mineral by the replica and the image.

In addition, the cement made from limestone can be sold though the fossil specimen found in the limestone mine cannot be sold in the shop. The sandpaper made from the garnet can be sold though the specimen of garnet discovered in the mine cannot be sold. It is quite difficult for a general person to understand this strange rule.

INVESTIGATION AND RESEARCH

It increases there is no curators in the museum, guides to the visitor, and the service of the judgment on minerals and fossils etc. has decreased. Moreover, the time that the curators spend on a geological research about the region has decreased because of

an increase in the business related to IGP. Therefore, academic conference presentations and the thesis writing in the field other than Geopark are slack, and the registration of the specimen of the museum is the stagnation feelings.

Keywords: Itoigawa geopark, museum, number of vistors, Fossa Magna Museum, museum shop, sales of specimen

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Citizen involvement research activities and its effects in Itoigawa Geopark.

Yousuke Ibaraki^{1*}

¹Itoigawa Geopark, ²Fossa Magna Museum

Itoigawa Geopark had joined in Global Geoparks Network in August 22, 2009. Many activities on promotion, education and research have been done before the Fossa Magna Museum had opened. One of the most remarkable features of these activities is citizen involvement research activities.

There are diverse rocks in age and formed environment in Itoigawa Geopark. In paleontology, there are seamount type limestone of Paleozoic, shallow marine to terrestrial clastic rocks of Mesozoic and deep to shallow marine clastic rocks of Cenozoic, and many fossil localities are in Itoigawa Geopark. In mineralogy, there are jade and rare mineral localities. In petrology, there are rocks from non-metamorphic rocks to eclogite facies rocks. Finding new minerals, rare or new species of fossils are cooperated with citizens in Itoigawa Geopark. For example, one of new minerals named Itoigawaite first found by a citizen. A new species of Paleozoic brachiopoda *Daviesiella omiensis* also found by a citizen. Museum curator had supported a citizen to research whale, shark and brachiopoda fossils.

Not only in geology, but biodiversity is high caused diverse topology from coast to alpine area in Itoigawa Geopark, and research activities cooperated with citizens are done in biology and ecology.

The following effects can be expected by research activities.

- Constant renewal of geo-stories which are foundation of Geopark.
- Increasing of tourist to Itoigawa, increasing of repeater, and its economic effect.
- More people have interest in Itoigawa Geopark, and have interest in earth science.
- Citizens know that they can make contributions for Itoigawa Geopark, and more citizens cooperate with curators.
- Make notable results in research activities, and people in Itoigawa are proud and have love for their hometown.

As I mentioned above, research activities is so important that it acts as a source of power to promote Geopark activity.

Keywords: Itoigawa Geopark, research activities, citizen, effects

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Room:Convention Hall

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Report on the Southern Alps -Median Tectonic Line Area- Geopark

Geopark promotion office Association for promoting Southern Alps¹*

¹Policy and Promotion Division ,Inacity

Report on the Southern Alps -Median Tectonic Line Area- Geopark

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Plan for Hakusan Tedorigawa Geopark

Tsuyoshi Hibino^{1*}, Takashi Yamaguchi¹

¹Hakusan City Board of Education

In Hakusan City, Ishikawa Prefecture, the conference of promoting Geopark is organized in 2010 and aim at authorized as the Japan Geopark for the present.

There are Mt. Hakusan and the Tedor River flows into the Sea of Japan, and there is rich nature in this area. This region has also various geological histories. There are the Hida metamorphic rocks, the Tetori Group and some volcanic materials. In addition, there are various geographical features in this area that formed by the Tedor River eroding those strata.

The living of people based on such geological features and geographical features also has various styles. People in this region have lived for a long time with the blessing and the disaster of Mt. Hakusan and the Tedor River. The influence of the water such as rivers exists always greatly for this region. Therefore, people's lifestyles have been considering peripheral nature.

The Mt. Hakusan-Tedor River region is a place where we can be felt the nature made from the planet earth of water, and moreover the symbiosis of such nature and people.

Keywords: Mt. Hakusan, the Tedor River, Geopark, Hakusan City, Ishikawa Prefecture

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Current state of the Japan Geopark "Dinosaur Valley, Fukui Katsuyama Geo-park"-Mainly educational programs and activiti-

Mikio Mizukami¹, Takenori Hatanaka¹, Hiroki Kinoshita^{1*}

¹Katsuyama City Geopark promotion confere

Dinosaur Valley Fukui Katsuyama Geopark was officially recognized as a Japan Geopark in October 2009. Although this designation is quite recent, Katsuyama has actually been in the forefront of fossil research and education projects for over a decade. Countless valuable dinosaur fossils have been uncovered from local excavation sites and put on display at the Fukui Prefectural Dinosaur Museum, a world-class facility which serves as the heart of this Geopark. Surrounding the museum is the Katsuyama Dinosaur Forest, where the children's Fossil Dig Experience event has been held for over ten years through the cooperation of the city and local NPOs. Boasting over 50,000 participants from all over the country, the Fossil Dig Experience has established itself as one of the city's most prominent dinosaur-related programs. Working in collaboration with programs such as this, the Geopark Promotion Group based in Katsuyama City Hall strives to further develop the park in both its scale and its public awareness. In addition to maintaining the park's individual geosites and creating informational pamphlets, the Geopark Promotion Group has also begun holding Geotours and seminars as well as special lectures at schools. Dinosaur Valley's acceptance as a Japan Geopark has certainly increased citizen's awareness, however programs such as the Fossil Dig Experience program which rely heavily on volunteer support require new assistance from citizens as current volunteers continue to get older. Furthermore, finding new geosites for fossil excavation is another issue the Geopark Promotion Group is working on to take this geopark to its maximum potential.

Keywords: Geopark, Fossil, Geotour

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Educational Activities in the San'in Kaigan Geopark

Ken'ichi Ishimoto^{1*}

¹San'in Kaigan Geopark Promotion Council

We conduct various educational activities in the San'in Kaigan Geopark. Especially, educational activities in each region are actively performed.

For example, educational activities in each school, hands on learning activities in "Geo Caravan" and "Geo Festival".

Keywords: San'in Kaigan Geopark, Educational Activities, Hands on Learning Activities

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O022-P20

Room:Convention Hall

Time:May 23 16:15-18:45

Natural environment and people's lives based on geodiversity -Case studies in the San'in Kaigan Geopark?

Noritaka Matsubara^{1*}, Tohru Sakiyama¹, Muneki Mitamura²

¹Inst. Nat. Env. Sci., Univ. Hyogo, ²Geosci., Osaka City Univ.

The natural environment and people's lives exist upon regional geodiversity, and are changing according to geohistory. Geoparks, now attracting attention as an approach for sustainable development, can create and utilize the connection between geological and geographical resources and the natural environment, culture, industry, etc.

In the San'in Kaigan Geopark covering three prefectures, we can observe geological features, the natural environment and people's lives, all related to the formation of the Sea of Japan. It is important not only for sightseeing but also for disaster reduction and a sustainable development to know the relationship between geodiversity and the natural environment, culture and industry. Moreover, giving a geological meaning to local resources leads to branding of the regional community.

Keywords: San'in Kaigan, geopark, geodiversity

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O022-P21

Room:Convention Hall

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The recently released handbook for teachers studying in the field at San'in Kaigan G.P.: Focusing on Tottori Sand Dunes

Yoshinori Kodama^{1*}

¹Fac. of Regional Sciences, Tottori Univ.

A handbook for teachers studying in the field has recently been released on the Web site related to San'in Kaigan Geopark, Japan. This handbook is primarily targeted at teachers. I will present the aims of this handbook, process followed in creating this handbook and introduce some of its contents.

Keywords: geopark, handbook, Web site, Tottori Sand Dunes, San'in Kaigan Global Geopark Network, local educational material

O022-P22

Room:Convention Hall

Time:May 23 16:15-18:45

Where the ocean and the land meet land -Scientific story of Muroto Geopark-

Tadahiro Shibata^{1*}

¹Muroto Geopark Committee

Cape Muroto retains the record of dynamic movements of the earth which resulted from the motion of tectonic plates. The Japanese Island Arc is located at a subduction zone. In most cases, the subduction zone is a region where an oceanic plate meets with a continental plate or another oceanic plate. The denser oceanic plate slides under the other plate and sinks into the mantle. The energy generated from the motion of these two plates is transformed as earthquakes, and the various associated tectonic and magmatic activities lead to continent formation (orogenic movement). Muroto Geopark provides an excellent example for these processes.

The explanation of the background of our geosites involves three geologic stages: 1) formation of the accretionary complex, 2) igneous activities and 3) topography formation accompanying the plate subduction. Other crucial factors are the expected large-scale earthquakes, as well as the disaster and blessings from the sky and the ocean. These are closely related to the various earth-phenomena in different time scales, ranging from several million years (e.g. plate motions) to over several tens of seconds (e.g. earthquakes).

Leading studies in earth sciences focus on "the past", that is retained in the ground of Muroto in the present case, and "the present", which can be observed at the bottom of the ocean off Muroto. Studies on the mechanism of generation of earthquakes and tsunamis are among the most active research fields in the world. Such studies have been conducted on Muroto's geology and the Nankai Trough off the coast of Muroto. The research findings are expected to serve as the basis of the information necessary for minimizing the damage from the earthquakes and tsunamis in the future.

Geological processes occur in time scales that are beyond that of human lives, making it difficult for us to relate them to our daily living. However, our lives are undoubtedly influenced by those processes. We benefit from them, and simultaneously, face the risk of natural disasters. The geosites in the Muroto Geopark possess significantly valuable and useful geoheritage which leads visitors to understand how active our planet Earth is.

What had occurred in the past and what will occur in the future in a region "where the ocean and the land meet?" How can the human civilization co-exist with natural disasters simultaneously enjoying the nature's blessings? The key to these questions lies in Muroto Geopark and at the bottom of the adjacent waters.

Keywords: Muroto, Geopark, Scientific story

O022-P23

Room:Convention Hall

Time:May 23 16:15-18:45

How to Enjoy Muroto Geopark 610 Times More! -The 11th Children's Summer School on Earthquakes and Volcanoes-

Tadahiro Shibata^{1*}, Tanaka Keiichi¹, Nakagawa Kazuyuki², Okada Tetsuya¹

¹Muroto Geopark Committee, ²Working group for Schoolchildren's summer

1. Introduction

The 11th Children's Summer School on Earthquakes and Volcanoes (hereafter, "Summer School") was held in Muroto City where local development and disaster awareness raising efforts have been actively promoted through geopark activities. Muroto Geopark has a theme: "Where the ocean and the land meet? the forefront for the birth of new land." Various evidence of the landform development is found in the topography and geology of Muroto. The children who participated in the "Summer School" event were divided into six teams and took part in several experiments and field trips under the theme: "How to enjoy Muroto Geopark 610 times more!" They explored such questions as: "What happens at the place where the ocean and the land meet?" "Where the ground beneath our feet in Muroto came from?" and "How do you live and enjoy leisure activities in Muroto?" In this presentation, the activities of this event will be reported along with its implications for geopark activities.

2. Activities of the "Summer School"

The children's activities started with finding Muroto's topographical and geological features through the comparison with the landscapes they are used to seeing. From the lookout by the scenic road, Muroto Skyline, they had a panoramic view of marine terraces and the Pacific Ocean. On the seashore, they saw and actually touched the emergent landforms including the accretionary complex. In answering the questions posed by the scientists, such as "In the scene in front of you, where do you think earthquakes happen?" children not only found the characteristic features of local topography, but also developed their own questions.

The field trip was followed by a few experiments held outdoors and indoors. The children created an "accretionary wedge" with flour and cocoa powder and made tsunami in a big water tank. Their questions raised during the field trip were answered through those experiments and explanations given afterwards. In addition, through talking with the leading researchers in the field, they began to understand how to enjoy the geopark.

The last item of the program was a presentation of the discoveries and ideas gained through the activities with the scientists during the two days. Later, the participated children became "Muroto Geopark Kids Advisors."

3. Useful implications for the Muroto Geopark

The "Summer School" was an important influence on the local geopark activities. It promoted the collaboration between the local residents and the scientists to create a scientific "story" together, which eventually improved the quality of geopark-related tours. Also, it raised awareness not only among the community members who participated with children, but also among those who learned about the event through the media. Since this event, increasing number of schools and community groups have asked us to send a guest instructor (our staff) to talk about geopark. Additionally, schoolteachers have started incorporating geopark themes into their teaching. What children gained from such visiting lectures or field trips has been reflected on their creative works, such as objet-making, painting, play, haiku and music.

This appears to be a rare case of learning experiences of the "Summer School" taking root in the community activities. Further collaboration of scientists and the community is expected to lead to an outreach effort promoting Earth science in the future.

Keywords: Muroto Geopark, summer school., outreach, education

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O022-P24

Room:Convention Hall

Time:May 23 16:15-18:45

Kirishima Geopark - The nature diversity and the volcanic activity -

Hiroyuki Sakanoue^{1*}, Kenichirou Yanagita¹, Souma Kubota¹

¹Kirishima Geopark promotion Team

Kirishima is a generic designation of a cluster of Quaternary volcanoes situated in southern

Kyushu, Japan. This volcano occupies an area of about 20km x 30km elongated, it spread out between Miyazaki prefecture and Kagoshima prefecture, and contains more than 20 small volcanoes which have been repeatedly active from Pleistocene to Recent times. The last eruption occurred on January 2011.

Kirishima Volcano as we see them today has been made by activities belong when Kakuto caldera forming (about 340,000years ago.)

Kirishima Volcano is just like a 'Museum of volcanology' because we can observe many types of volcanoes and volcanic products (lavas, pyroclastic flows, lahars, etc).

The eruptive activity of Kirishima and global climate change make a very rich natural environment in this area. We can observe many kinds of precious plants in all seasons.

At 31, January 2011, Shinmoe-dake has erupting hardly , and it give hard damage to flora on nakadake, takatihonomine. But the cycle of flora at kirishima is just start now.

We will introduce the nature diversity and the volcanic activity of Kirishima.

Keywords: Kirisima Geopark, geopark, shinmoe-dake Volcano

0022-P25

Room:Convention Hall

Time:May 23 16:15-18:45

Origin of Amakusa Islands -Amakusa Goshoura Geopark-

Hiroaki Ugai^{1*}, Yoshitaka Hase¹

¹Amakusa City Goshoura Cretaceous Museum

Introduction: Amakusa Islands is an archipelago, situated western Kyushu and that is beautiful landscape keeping the marine environments for nature in all of its wonderful coastal lives. Amakusa Islands also have various geologic resources and stonemasonry cultures. Amakusa Goshoura Geopark shows the geologic history since the Cretaceous in the eastern part of Amakusa Islands.

Chapter 1:The geologic history of Amakusa Islands started at about a hundred million years ago, when some granitic magma intruded into deep underground in the eastern area of Amakusa Islands. Before long, the area uplifted and a land appeared. The ancient Amakusa area located coastal area at a hundred million years ago. The various kinds of ancient lives flourished both on the ground and in the sea. There are many important geologic aspects including valuable fossils of dinosaurs, mollusks and plesiosaur within the Goshoura Group.

The ancient Amakusa area sunk under deep-sea in the Late Cretaceous (85 to 65.5 million years ago). Therefore, the Goshoura Group covered by the Himenoura Group. Deep-sea clay and silt alternation with some thinner sandstone of the Himenoura Group contains abundant remains of ammonite, large marine bivalves, and some scattered fish and echinoderms. The Himenoura Group deposited about 3,600-4,000m in thickness during an interval of 20 million years. Dinosaurs were extinct at the upper part of the Himenoura Group in Amakusa Islands.

Chapter 2 : After the age of the dinosaur extinction, the Amakusa area repeated twice uplift and subsidence such as deep-sea bottom to land surface, under the tropical climate in Eocene (50 to 40 million years ago).

The Akasaki Formation of the Miroku Group formed of terrestrial origin and contained of turtles and large mammals, such as Coryphodontidae and Trogosus, which hold the record for the oldest fossils in Japan.

The Amakusa area subsided under the shallow sea following the terrestrial period. The Shiratake Formation of the Miroku Group is composed of thick sandstone, which is yield marine mollusks, such as Turritella (Gastropoda), and Nummulites (benthic foraminifera), and large mangrove gastropod in tidal flat blackish.

The Kyoragi Formation of the Hondo Group formed mainly clay and silt alternation intercalated some thinner sandstone with Nummulites, which deposited under deep-sea.

Chapter 3 : The magma activity happened from Kyushu to Setouchi coastal area in Neogene. Intrusive rocks originated felsic and intermediate magma intruded into the Paleogene strata of Amakusa Islands during 19 and 14 million years ago. Diabase intruded partly into the Kuratake area of Amakusa-kamisima and Goshoura Islands.

The Japan Sea at the eastern part of Eurasian Continent had open in the early Miocene. At the Amakusa Islands, the formations formed in Cretaceous and Paleogene were deformed by pressure for spreading of the Japan Sea crust. It might be resulted in three synclines and two anticlines of the geologic structure in the Amakusa area.

Chapter 4: In the Last Glacial period (about 20,000 years ago), the human life did hunting of animals including deer and ancient elephant, which flourished on the plain and forests of Ariake and Yatsushiro sea areas where did not been today's sea. The human settled in the coast since about five thousand years ago.

In the end of 16th century, the western culture blossomed in the Amakusa area for the geographical advantage in its facing to the East China Sea. After the Amakusa Rebellion, people found underground resources. People worked in the coal ceramic and stone mines and blossomed the culture of stonemasonry in 20th century.

The Goshoura Geopark, which began in 2009, is the area with special geologic significance. The Amakusa area works on the new regional development promotion by the beginning of the Goshoura Geopark.

Keywords: Amakusa, geopark, Goshoura, fossil

O022-P26

Room:Convention Hall

Time:May 23 16:15-18:45

The first underground mining 'geopark' in Zabrze, SW Poland- for promotion of geo-tourism

Dorota Kapuscik^{1*}

¹Earth Sciences, Waseda University

This poster introduces a project of the first underground geopark, based on selected post-mining sites of Zabrze City in south-west Poland. It has been elaborated by Polish Geological Institute in Warszawa and aiming creation of a link among various mining sites on the town territory.

Geopark as a surface defined regional structure is based on the following aspects: geological, architectural, sometimes postindustrial, environmental, historical and other aspects (depending on the area). Projected geopark will be founded on objects like 'Historic GUIDO Coal Mine', 'The KROLOWA LUIZA Mine' and 'MACIEJ Shaft'.

Zabrze is the place where the International Conference is held every year, in which guests are the representatives of industrial heritage and tourist organizations from Poland, Europe and other countries, as well as academia.

There are a very few places in Europe with such numerous industrial heritages, mainly related to mining. Some of the existing industrial heritage facilities had already been made available to the public there. However, no geological complement is provided, so an exemplary visitor there couldn't find how the mined rocks have been formed. Proposed geopark will provide detailed geological information to the public as well as create new opportunities for touristic-cultural activity and local economy.

The geopark will be the first mining geopark in Europe such that most of main touristic attractions are located underground.

Keywords: geopark, geotourism, mining, industrial heritage, Polish Geological Institute, Poland

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Let's dig up "Geoheritage":100 geosites in Hokkaido are being recruited!

Kiyoyuki Shigeno^{1*}, Jun Tajika², Masayuki Ishii³

¹Meiji Consultant, ²Geological Survey of Hokkaido, ³Hokkaido geosites examination group

In Hokkaido there are many localities in which part of the history of the landscape is well documented. The Geosites examination group, Hokkaido branch of Geological Society of Japan has started the list-up and describing "sites of geological interest" since March, 2008. The purpose of list-up of geosites is to promote the conservation of Hokkaido's rich heritage of landscape, rock, fossil and mineral sites. And the objective is to inform a wider public including local populace of the importance of this patrimony, and of scientific geological and geomorphological values. Please read the necessary information on:

<http://www.geosites-hokkaido.org/>

Keywords: 100 Geosites, 100 geosites in Hokkaido, geosites, website, geoparks, database

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O022-P28

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Workshop of geotourism in Science Agora

Kuniyasu Mokudai¹, Marekazu Ohno², Tadahiro Shibata³, Mahito Watanabe^{4*}, Yuki Sawada⁴

¹Pro-Natura Foundation, Japan, ²Unzen Volcanic Area Geopark, ³Muroto geopark promotion committee, ⁴GSJ, AIST

We held the workshop of Geotourism in Science Agora 2011. The person interested in the science communications was targeted. The contents are the keynote address, virtual Geotour and panel discussion of Geopark. The opinion of the future of Geopark from various aspects was discussed.

Keywords: geotourism, virtual geotour, promotion of geopark, science communication, Japanese Geopark Network

O022-P29

Room:Convention Hall

Time:May 23 16:15-18:45

Let us enjoy Geo-Tetsu - the Third proposal of Geo-tours through Train Windows, JR Yodo Line in Shikoku

Masayo Fujita^{1*}, Hironori Kato², Shunji Yokoyama³

¹Fukada Geological Institute, ²Aratani Civil Eng. Consultants Co.,Ltd., ³Sci., Kochi Univ.

1. Aims of Geo-Tetsu activities

Succeeding two year's presentation (Kato et al., 2009; Fujita et al., 2010), we will present Geo-Tetsu this year too.

The activity of Geo-Tetsu recommends Geo-tours through train windows. The word "Tetsu" contains meaning of the abbreviation of railway in Japanese, and of the generic name of railway fans. In Japan, railway is the commonest transportation system, everybody loves to ride trains. Geo-Tetsu offers the chances to get contact with the geoscientific features observable through train windows. Here in Geo-Tetsu, geologic and geographic features of the sceneries are explained plainly but scientifically by a guide-book prepared by a group of specialists. Therefore, the Geo-Tetsu can offer the opportunities to get contact with geoscience in travelling by trains. It is nowadays said that people become less and less aware of natural sciences in this country. Geo-Tetsu could, we hope, make people's eyes direct to geosciences, or eventually toward natural sciences.

We selected Geo-Tetsu courses and Geopoint through which people can see representative geoscientific phenomena through train windows. They are better accompanied by walking paths accessible at the stopovers alongside the railway routes. Availability of shorthistories about the selection of the rail routes is also taken into consideration. In short, the routes should offer the chance for geosciences to be seen, touched and felt through train travelling. As many information as obtainable are gathered from various perspectives; railway itself, geology and geography, and sight-seeing as well. A group of specialists compiled a guide-book using gathered information which is a key element of the Geo-Tetsu.

A first Geo-Tetsu proposal of JR Dosan Line in Shikoku started by our project two years ago, and we tried to investigate Gomen- Nahari Line as a second proposal last year. Here the JR Yodo Line is presented as a third project of Geo-Tetsu.

2. JR Yodo Line in Shikoku, the third project of Geo-Tetsu

(1) Abstract of the Yodo Line

The Yodo Line runs along the Shimanto-River, from Wakai tation at Shimanto Town in western area of Kochi Prefecture to Kita-Uwajima Station at Uwajima City in the southwest region in Ehime Prefecture. It is 76.3km in total distance, and is opened in March 1974. This line was planned originally as a route from Ehime Prefecture to Kochi Prefecture in the Meiji era. After many complications, its part was opened as the Uwajima Line as a kind of light railway in 1914, it took 60 years to the opening of present line. Therefore, the old and new technology coexists together in Yodo Line, and then many engineers and railway fans are attracted to the facilities of this railway.

(2) Rich sight-seeing resources of the Yodo Line

Yodo Line runs almost according to Shimanto River. We recommend to enjoy watching the development of incised meanders and the subsidence bridges from the train window, between Tosa-Taisho Station and Yoshinobu Station. Hard sandstone and fragilie mudstone of Shimanto terrane crop out at the riverside which has been eroded by the Shimanto River. Then differential erosion makes strange features of "sandstone's heads" on the Shimanto River. When we pass Yoshinobu Station, the scenery of the train window completely changes. For the dogleg appears many times, the speed of the train becomes slow. In the north side of Iyo-Miyanoshita Station, we can see the Hokezu mountain range which dives the Pacific Ocean and the Inland Sea. Along the ridge of the Hokezu mountain range, there is the Butsuzo tectonic line. Going out of Muden Station, there is a hardest area called Madonoto Pass. The train runs down through the steep slope of about 140m relative height between two stations. At the end of Geo-Tetsu tour of Yodo Line, we can see the rias coast in Uwajima region.

Keywords: Geo-Tetsu, Yodo Line, Shimanto River, Subsidence bridge, Incised Meander, Geo-tour

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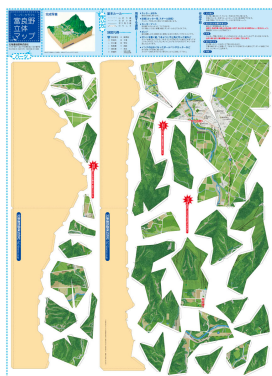
Development of Papercraft 3-dimentional map

Hideaki Matsumoto^{1*}, Takuya Suzuki¹, Takeshi Nishida¹

¹Hokkaido Chizu Co. Ltd.,

We developed the method of making Papercraft 3-dimentional map from detailed topographic model (Triangle Irregular Network: TIN).

This Papercraft maps are represent real landscapes and available for educational purposes. The processes of putting the Papercraft together are helpful in understanding characteristic landforms such as Geopark or other natural parks.



Keywords: Papercraft, 3-dimentional map, landscape