

Effective Use of Map Assets of Geopark by Smart Phone Services

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Geopark needs many type of map information such as Guide maps, Geological maps, Hazard maps and so on.

We developed the apps "Stroly - Geopark" which enables you to display such maps on your smart phones with GPS location.

"Stroly Geopark" also provides interesting landmarks and point. You can visit these landmarks by GPS navigation and get information about it from smart phones.

Keywords: geopark, smart phone, GPS, transmitting information



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Hokkaido Shikaoi Geopark plan

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preparing

Mikasa Coalfield Geopark Plan: Relationship between the history and geological background

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The City of Mikasa, a local government in Central Hokkaido, Japan, is rich in nature and materials (coal and fossils) in spite of a short distance from the main cities of Hokkaido (e.g., the cities of Sapporo and Chitose).

Mikasa had flourished as a coalmine city, and had a population of over 60,000 in 1950s, whereas now the city only has a population of about 10,000 because of the closing of the coal mines.

The story of modern Mikasa began with the discovery of soft coal in 1868 (the first year of the Meiji era). The coal of Mikasa occurs from the fluvial succession, called the Ishikari Group (about 50 Ma).

Moreover, the city is a suitable area for researching the Cretaceous biotic history and paleoenvironments because the Cretaceous marine succession, called the Yezo Group (about 100 Ma), is widely distributed, and yields well-preserved fossils (e.g., ammonoids and marine reptiles).

In the presentation, we introduce the Mikasa Coalfield Geopark Plan and characteristics of geology, nature, and history in Mikasa.

Keywords: City of Mikasa, coal, coal mines, fossils, Geopark

The measure for the Great East Japan Earthquake and the "Sanriku geopark concept"

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¹Iwate Sanriku geopark promotion conference scientific expert committee, ²Iwate Sanriku geopark promotion conference, ³Chuo Kaihatsu Corporation

There are a lot of famous scenic spots such as the precious geology of the Mesozoic and the Paleozoic along the coastal area of Iwate Prefecture. The Iwate Sanriku Geopark promotion conference was established based on above the theme on Feb. 2011.

The conference was stopped temporarily during the great east Japan earthquake period, For the purpose of post-disaster recovery and reconstruction, the scientific expert committee was established, and the promotion conference of The Iwate Sanriku Geopark was restarted.

After that we have done many efforts on preservation disaster ruins and have carried out a new geopark initiative.

In order to tell our memory of tsunami disaster to future generation, the first thing we did is that review the contents of initiative, the secondly is that added the phenomenon of tsunami hazard and post-disaster recovery to the theme of our association, finally restarted our program based on above result.

A tsunami disaster has a characteristic that no any trace remained after disaster. Although many tsunami disasters occurred repeatedly in the past, and many people were killed by large disasters, the sign of the plate level in which the height of tsunami will be remained sometimes, but it is not so much. Another reason why natural trace cannot remain easily is that the rubble will be removed after disaster. As result, the scenery of tsunami disaster is remained in memory of people's only.

Furthermore, some people have negative opinions on preservation of disaster ruins for the purposes of forgetting sad memory. But the disaster ruins can transfer a strong message to future generations, so that the preservation of ruins is becoming a very important thing to protect people's lives who do not know what tsunami is in the future.

Now, the homepage (sanriku-fukkou.net) was opened for the purpose of promotion of the support extension and sightseeing.

The inspection of people, researcher come from university and research institute and local governments has been gotten our help, Furthermore, earthquake disaster revival symposium was held on Nov., last year.

Moreover, some events of research group for the monitor travel and guide training for children have been started.

Aiming for geopark authentication of Japan, the promotion conference will enlarge the range of activities from now on.

Keywords: geopark, Tsunami hazard, Iwate Prefecture

Activity in the Hakusan Tedorigawa Geopark.

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¹Hakusan City Board of Education, ²Kanazawa University

Since the inauguration of Hakusan Tedorigawa Geopark Promotion Council in 2010, Hakusan City in Ishikawa Prefecture make efforts public awareness of the Geopark through various activities. Hakusan Tedorigawa Geopark authorized by the Japanese Geopark Network on September 2011. Therefore, awareness has been increasing in this region little by little.

Main theme of the Hakusan Tedorigawa Geopark is traveling of the water (water circulation). There is an abundant water resource and various grounds that is made with water in this area. In addition to those, the nature and the living of peoples that has consisted on those is designated as the places of interest. The mass snow which it accumulates in the winter, becomes the cause of the abundant water resource. With the water, it is advertising snow together with the image of the Mt. Hakusan.

Hakusan Tedorigawa Geopark has done activity, e.g. geopark guide training lecture, monitor geopark tour, the spread lecture which is done in each area and various groups, the continuous providing information which is by the home page and the public information magazine and the education activity regarding geopark in the school. Because cultivation of geopark guide is important, it is one of the activities performed by putting in power. Since a volunteer guide group is in each area in the city from the first, respectively, the unification as geo-guide has been a problem. But, each group has been active actively, if this is well unified as geo-guide, it should become a good guide of the geopark.

In respect of education, it has approached the school in the area for taking in a geopark study by school education. Moreover, not only children but activity as local study using the public hall of the area is performed positively.

In addition, it is being begun gradually to prepare the pamphlet about a geopark, the guidance signboard in each geosite, etc. But Hakusan Tedorigawa Geopark is not a geopark which makes one intelligible big Geo element main unlike the existing geopark. Therefore, a device is needed for how to show a theme and the method of guidance.

However, although it is striving for spread through these activities, generally the language itself called "Geopark" has not permeated still more. We are going to continue perform more active activity.

Keywords: geopark, Mt. Hakusan, Tedorigawa river

Application of an experience-learning facilities, the Fossil Valley to education and study.

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¹Fossa Magna Museum

Introduction

The Fossil Valley is an experience-learning facilities in the Fossa Magna Museum in Itoigawa Geopark where we can hunt fossils of 300 million years ago. There are many limestone including fossils at the Fossil Valley, side of the parking lots. Anyone (7 years and up) can have an experience of fossil hunting.

How to use the Fossil Valley

Those who want to attend fossil hunting at Fossil Valley needs to apply at the information counter of the Fossa Magna Museum, and rent a hammer, goggles, a pair of work gloves and a bucket for fossil hunting and buy accident insurance. The time limit to hunt fossils is 2 hours because facilities are run out in high season and almost user finish hunting within 2 hours. After hunting, users are able to get identification service of fossils that they find (available only when curators are at the museum). Most of limestone in the Fossil Valley are including fossils because we choose fossiliferous limestone at the quarry and brought them to here. Most of users are able to get more than one fossils in 1 hour.

Application to education

Elementary schools or junior high schools in Itoigawa City use the fossil valley to learn the history of earth in science or integrated study class since before. Itoigawa City Board of Education had draw up the Policy of Consistent Education for age of 0 to 18 years Children in 2009 FY, and include the clause, Creation and Development of Itoigawa Geo-Learning. Therefore more students in Itoigawa City will learn about Geopark and the history of Earth, and use the Fossil Valley. Since Itoigawa Geopark had joined to the GGN in 2009, the utilization of the Fossil Valley by Junior high school, high school and private science school which located outside the Itoigawa City is increasing.

Curators guide to hunt fossils at the Fossil Valley for students in the case of school classes and had received a reservation. Before fossil hunting, curators explain where the fossil occur, the age and kind of fossils, the environment that the creatures which become fossils in the future, how to use a hammer, matters to be attended to fossil hunting. In the time of fossil hunting, curators answer the questions of students, for example, is this a fossil? or what kind of fossil is this? After fossil hunting, curators identify the fossil that students had found.

Application to study

In August, 2011, an 8-years-old pupil from Saitama Prefecture attended fossil hunting and found a fossil in the Fossil Valley. It was a very rare enigmatic Cyclid crustacean. Cyclid had found in a black limestone from Kotaki, Itoigawa in 2009 (Niko and Ibaraki, 2011). This Cyclid, *Cyclus tazawai* (Niko, 2011) was the first found Cyclid in East Asia. This important news was published in newspapers and websites. The Cyclid found by a pupil in the Fossil Valley is the second found Cyclid in East Asia. This news was published in newspapers and websites. We are studying this fossil now.

Conclusion -the significance of education and study in the Geopark-

Geopark is a kind of natural park that people enjoy learning the history of Earth. Fossils are very useful for children and adults to get interested in the history of Earth. We can find fossils by ourselves at the Fossil Valley. New discoveries are published in a newspaper or website, and more people have an opportunity to get interested in the history of Earth. And new discoveries provide a new topic for a story of Earth. Study is an important driving force for the development of Geopark.

Keywords: Itoigawa Geopark, experience-learning facilities, the Fossil Valley, education, study, application

Preservation and Utilization of Epicentral Earthquake Heritage in the San'in Kaigan Geopark

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The Kinki region is densely packed with active faults, and epicentral earthquakes have occurred many times. In the San'in Kaigan Geopark, several destructive earthquakes have occurred since the Meiji period (1868), including the 1925 North Tajima Earthquake (Kita-Tajima Earthquake, M 6.8), the 1927 North Tango Earthquake (Kita-Tango Earthquake, M 7.3) and the 1943 Tottori Earthquake (M 7.2). As such, our Geopark has many heritage sites related to epicentral earthquakes. We will introduce the damage of these earthquakes, disaster recovery, and discuss how we can preserve and utilize our epicentral earthquake heritage.

< Destructive Earthquakes in the San'in Kaigan Geopark >

The 1925 North Tajima Earthquake is also referred to as the Hokutan-Daishinsai, and the epicenter of seismic activity was in what is now the northern part of Toyooka city, Hyogo prefecture. The magnitude is estimated to have been 6.8 on the Richter scale. The towns of Kinosaki hot springs and Toyooka, both located near to the seismic center, were seriously damaged, and in total 428 died due to the earthquake itself and in the fire that occurred afterwards.

It has been reported that the epicenter of the 1927 North Tango Earthquake was in the northern part of the Tango peninsula, Kyoto prefecture and the magnitude was 7.3 on the Richter scale. The death toll is recorded to have been 2,925. The Gomura fault (NNW-SSE: left-lateral slip) and the Yamada fault (ENE-WSW: right-lateral slip) which are conjugate faults were moved simultaneously by this earthquake. The maximum dislocation of the Gomura fault was estimated to be 100 cm vertically and 270 cm horizontally. These faults are also known for the fact that the term "active faults" was used in reference to them for the first time in Japan.

The epicenter of the Tottori Earthquake was offshore from Ketaka District, now part of Tottori city, with a magnitude of 7.2 on the Richter Scale. In Tottori city, its seismic intensity was recorded as 6. 1,083 were killed, mainly in Tottori city. The Yoshioka fault that measures 4.5 km and the Shikano fault that measures 8 km long in the ENE-WSW trend were formed in this earthquake, and the Yoshioka fault exhibits a right-lateral slip amounting to 1.5 m in the maximum. In terms of vertical displacement, the south side was raised amounting to 75 cm in the maximum.

< Earthquake Recovery and Epicentral Earthquake Heritage >

At the Kinosaki hot springs, which were seriously damaged by the North Tajima Earthquake, the local residents have developed a recovery program. The fire wall itself is a Geosite now, and also the basalt of Genbudo Cave, which collapsed during the North Tajima Earthquake, is now used for the stone wall of the Otani River, making a beautiful scene. The European style buildings built after the earthquake are preserved as symbols of the earthquake disaster reconstruction heritage of Toyooka city and Kyotango city. The Gozoen building (a national cultural property) in Tottori city, which escaped destruction by the Tottori earthquake, is preserved and utilized as a local community center.

Three typical outcrops of the Gomura fault are preserved as natural monuments of Japan, and two of them are open to the public as Geosites. However, other faults are not fully preserved and utilized in this way.

< Preservation and Utilization of Epicentral Earthquake Heritage >

Many earthquake heritage sites remain in the San'in Kaigan Geopark, and it is possible to utilize them for disaster management education. However, we have not made much use of them until now. It is necessary to improve these sites and to utilize them for disaster management education.

Keywords: Earthquake Heritage, Preservation and Utilization, Geopark, San'in Kaigan, Earthquake Recovery

Activities for Geopark registration(Shikoku'sSeiyo-Kurosegawa area-)

TAKAHASHI, Tsukasa^{1*}

¹Seiyo City inEhime Prefecture

Our city is located in western Shikoku and is 515 square kilometers in area.

Our region has an elevation difference between 0 and 1400 meters above sea level, and there are many regional treasures

Regional treasures include Shikoku Karst which has valuable topography, plants and animals; the Uwa Basin which has a traditional street, many old buildings and ancient tombs; the Northern Uwakai Sea area which has wonderful views, rias coastlines and terraced fields; and a preserved traditional culture.

Another regional treasure is the Kurosegawa Tectonic Zone, an important stratum extending from Kyushu through Shikoku to Kanto via the Kii Peninsula.

It is the oldest stratum in Japan dating back more than 400 million years, and our city is the birth of its study.

Kurosegawa Tectonic Zone is an indispensable stratum for investigating the origin of the Japanese Islands.

Through this poster exhibition we will introduce the nature and ecological systems, and the cultures of our region which reaches from the sea to the village to the mountains.

We will also introduce our activities from last year for Geopark.

Keywords: Kurosegawa Tectonic Zone, Shikoku Karst, The Northern Uwakai Sea, The Uwa Basin

Spreading activities for 'Amakusa Geopark' conception

HASE, Yoshitaka^{1*}, UGAI, Hiroaki¹, HIROSE, Koji¹

¹Goshoura Cretaceous Museum

One of the objects of the Amakusa Goshoura Geopark is to maintain existing sites while developing new sites. In support of this objective, volunteer guide groups for the geopark were created as introductory and intermediate level volunteer guides to perform auxiliary activities at the Goshoura Cretaceous Museum and at fossil places for visitors. As a broader reaching prospectus, the "Amakusa Geopark Promotion Association" was created in December, 2010 as a cooperative effort by Amakusa city, Kamiamakusa city, and Reihoku town with the concept of including the whole of the Amakusa area into one geopark where related activities for the entire Amakusa region have started. At the inception of the formation of this cooperative, promotion began with the explanation of what a geopark is, visiting potential spots of interest within the proposed area of the geopark and ensuring an understanding of the geopark concept for sightseeing volunteer guide groups in Hondo, Itsuwa, Tsuji Island, Ushibuka and the Kamiamakusa area.

Furthermore, in order to present a general understanding, a lecture course entitled "Amakusa study on geology and relationship to human life" has been offered once every month from April, 2011 for the general populace in Amakusa city and Kumamoto city until now. The main measures of the activities in Amakusa are introduced as follows:

1 Geopark volunteer guide training in the "Amakusa Goshoura Geopark"

- * Theoretic and practical introductory class training.
- * Theoretic and practical intermediate class training for those holding an introductory level qualification.
- * The independent organization of the "Goshoura volunteer guide group", which cooperates with the Goshoura Island Tourism Promotion Association, carries out and its member services for visitors.

2 Explanation of the "Amakusa Geopark concept" for the sightseeing volunteer guide organization

- * Briefing sessions for sightseeing volunteer guides in the Hondo area, Itsuwa town, Tsuji Island, Ushibuka town, Reihoku town, and Kamiamakusa city are given to explain the aspects of geopark sites in each area.

3 A lecture "Amakusa study for geopark" from the viewpoint of geopark concepts

- * A lecture is offered for the general public once every month at the Amakusa Citizen's Center at Hondo in Amakusa city and at the Eastern Public Center of Kumamoto city.

The advantages of a geopark in Amakusa will become apparent to people who live in the area as they familiarize themselves with Amakusa's unique geographical features, the geology of the land, and its nature through the efforts of geopark training and information sharing. Residents will come to know the merits of the area further by understanding the relationship of present-day Amakusa to its history and culture and by sharing this native perspective with visitors to the area. From this viewpoint, a general educational campaign, including volunteer guide training, is performed in Amakusa while informal educational activities concerning Amakusa are offered in outlying areas.

Keywords: Amakusa Goshoura, Amakusa Geopark conception, volunteer guide training, Amakusa study for geopark

Geosites information in Amakusa Islands

UGAI, Hiroaki^{1*}, HIROSE, Koji¹, HASE, Yoshitaka¹

¹Goshoura Cretaceous Museum

Amakusa Geopark Plan will start consultation for Amakusa Geopark in 2010. The plan will start at the Goshoura area and will eventually cover all of the Amakusa Islands. After that, an application will be made to add Amakusa Geopark to the Global Geopark Network.

There are many important geologic aspects including valuable fossils of dinosaurs, mammals and mollusks in the Goshoura area. There are over 40 educational spots for finding fossils in the area, a fossil park, a show-house of ammonite and others with plates for explanation, not to mention various dinosaur remains. Sea taxi or rent yourself a bicycle takes you to these geosites and short trip programs giving for elementary, school students and tourists, which include taking fossils, learning a traditional fishing method called tontoko-ryo and a home-stay plan from 2001. The Goshoura area was selected as the 'top 100 geologic areas in Japan' in May 2006 and Amakusa Goshoura geopark in October 2009.

We planed two excursions in the Amakusa area on the 5th international UNESCO conference on Geoparks in Unzen Volcanic Area Global Geopark. Pre-conference Excursion plan is an overnight trip to the Cruising tour of the Amakusa Islands and Amakusa Goshoura Geopark. Post-conference Excursion is two overnight tours of Geosites of the Amakusa Islands and Amakusa Goshoura Geopark. We make better based on the participants questionnaire, satisfaction for feelings, impression, price of tour fee, service, entertainment, hospitality etc...

Amakusa Geopark Promote Conference had a meeting consultation for "Amakusa Geopark" in 2010 and will apply to the Japanese Geopark Committee. Within three years from that time, Amakusa area will apply to have Amakusa Geopark join the Global Geoparks Network. Purpose of the Amakusa Geopark Plan are increase in the nonresident population, regional development for increase in the nonresident population, local patriotism, and the commercial activity in Amakusa area, based on good effect of Amakusa Goshoura Geopark activities. We promote the "Amakusa Geopark" for original geopark activity (Amakusa style) and keep the sustainable development in Amakusa area.

Keywords: geopark plan, Goshoura, Amakusa, Excursion

Enlightenment program, Talk to us about Aso Geopark

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¹Aso Geopark promotion Council

We have continued to run educational programs about Aso Geopark to raise awareness and understanding of the area. From the end of 2011, we have been developed new programs toward some groups of eight towns and villages.

I would like to introduce to you here.

[Goals]

1. We hope that local residents within Aso Geopark will be more able to give information about their own area and daily lives with better knowledge of their area and training.
2. We want to share our enthusiasm with the local people for geopark activity.
3. The local people have the very best information about their own districts and have been vital sources for Geosite research of the areas
4. This time participants have included tourist association, association of commerce and industry, the landladies of traditional inns Okami, workers from the travel agent and residents' association members. This direct involvement by the participants will generate new activities with their own ideas.

[Contents]

1. Explanation by a secretariat, 10 min.

To qualify as a member of Global Geopark Network

2. Fill in a questionnaire, 5 min.

About the geosites around the area

3. Explanation by an instructor, 50 min.

Outline of Aso Geopark and geosites

4. Questions and Answers, 15min.

5. Opinion poll, 10min.

[Instructor]

The 3 members of academic adviser

[Period and participants]

From December 2011 to February 2012

[Tasks for the future]

Some participants are very interested in the geopark or the geosites and they made many questions to the instructor, on the other side some are dull response. And we admit regional differences in our area.

From now on, we hope that local people have widely understanding and interests about Aso geopark.

Keywords: geopark, Aso, enlightenment

Let's enjoy Geo-Tetsu through Train Windows -the Fourth Geo-Tetsu Line, JR Oito Line

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1. Aims of Geo-Tetsu activities

Geo-Tetsu is the name of the activity that shows everyone ways to enjoy and learn about geology and related sciences, using railways (Kato et al. 2009). The word "Geo" comes from geoscience, and the word "Tetsu" is an abbreviation of railway in Japanese, and common name for railway fans. Following three year's Geo-Tetsu (Fujita et al., 2010, 2011), promotion activities of Geo-Tetsu tours are continued by geological engineers who love railways, organized with the corporation of the Fukada geological institute. We selected Geo-Tetsu courses and Geo-points through which people can see representative geoscientific phenomena through the train windows and at the stopovers alongside the route. In Geo-Tetsu, geological features of the landscape are explained scientifically in a guide-book provided by a group of specialists. As much information is obtainable and can be gathered from various perspectives; the railway itself, geology, geography, cultural heritage and sight-seeing as well. We hope that the general public will enjoy a new style of railway traveling provided. The JR Oito Line is presented in this fourth route by the cooperation of Itoigawa City.

2. JR Oito Line, the fourth Geo-Tetsu project

(1) Abstract of the Oito Line

The Oito Line (105.4km) runs from Matsumoto station in Nagano Prefecture to Itoigawa station in Niigata Prefecture. It is operated by express trains between Matsumoto and Minami Otari (JR-East), and by the local trains between Minami Otari and Itoigawa (JR-West). The history of Oito line started as Shinano Railway in 1916, from Matsumoto to Shinano Omachi. JNR succeeded the extension from Shinano Omachi to Itoigawa. But it became difficult constructions because a part of this line was positioned in disaster area due to the avalanche and huge landslide. After the Pacific War, it was restarted by people's aspirations in 1952. The remainder Nakatsuchi-Kotaki section was opened completely and it became "Oito Line" in 1957. Since then, this line has been loved for a long time by alpinists, skiers, tourists who enjoy hot spring, and railway fans.

(2) The rich geological and sight-seeing resources of the Oito Line

The Oito Line runs along "Fossa Magna" which separates Japan into eastern and western. When the train leaves Matsumoto station and goes across the Azusa River, it appears beautiful Geo-points; Northern Alps Mountains of 3000m class located on the outside of Fossa Magna western margin on the west window, and the mountains of 1000m class located on the inside of Fossa Magna on the east window. Through Azumino agricultural area in the Matsumoto basin, we can see also geographical features of many alluvial fans. "Nishina Three Lakes" is approached through Shinano Kizaki station. Lake Kizaki is a natural dam damming up by the deposits of alluvial fan, and Lake Aoki is also a landslide dam by blocking the valley with the collapse deposits from the westward mountain. The beautiful ridge line of the Hakuba Three Mountains shines until arriving at Shinano Moriue station. Many famous skiing resorts around here are constructed by using of the landform. Arrived at Minami Otari station, we change the train to go to Itoigawa. Going through the Nakatsuchi station, there are many tunnels and sheds that let us know the toughness of nature in this region. The huge collapse scale of Mt. Manaita and Hieda is memorized in the valley width with the deposits around Kita Otari. In summer, the bus for the Renge hot spring leaves at Hiraiwa station, and it becomes the starting point for a climb of the Mt. Shirouma. Kotaki River became famous for the jade is joined Himekawa River near the Kotaki station. The Itoigawa-Shizuoka Tectonic Line can be observable near Nechi station. The Miyama Park is on the hill seen from the Himekawa station. Finally we arrive at Itoigawa terminal, and can transfer to JR Hokuriku Line. If you walk around the terminal, you will actually feel coming to the Sea of Japan.

Keywords: Geo-Tetsu, Oito Line, Fossa Magna, Itoigawa-Shizuoka Tectonic Line, Himekawa River, Jade

Let us Enjoy Geo-Tetsu - the Fifth Geo-tour through Train Windows, JR Furano Line in Hokkaido

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1. Aims of Geo-Tetsu activities

Geo-Tetsu is the name of the activity that shows everyone ways to enjoy and learn about geology and related sciences, using railways (Kato et al. 2009). The word "Geo" comes from geoscience, and the word "Tetsu" is an abbreviation of railway in Japanese, and common name for railway fans. Following three year's Geo-Tetsu (Kato et al.,2009; Fujita et al.,2010, 2011), promotion activities of Geo-Tetsu tours are continued by geological engineers who love railways, organized with the corporation of the Fukada Geological Institute. Geo-Tetsu offers the chance to get acquainted with geological features, not only through train windows but also along paths accessible from the stopovers alongside the railway routes. We selected enjoyable Geo-Tetsu courses and Geo-points, which means important geological sites visible, through the train windows from stops alongside the route. In Geo-Tetsu, geological features of the landscape are explained scientifically in a guide-book provided by a group of specialists. As much information is obtainable and can be gathered from various perspectives; the railway itself, geology, geography, cultural heritage and sight-seeing as well. We hope that the general public will enjoy a new style of railway traveling provided by the Geo-Tetsu. The JR Furano Line is presented in this fifth route of Geo-tetsu.

2. JR Furano Line, the fifth Geo-Tetsu project

(1) Abstract of the Furano Line

The Furano Line runs along the Daisetsu-Tokachi mountain range, from Asahikawa station in Asahikawa city in northern area of Hokkaido to Furano Station in Furano City in the center of Hokkaido. It is 54.8km in total distance and its symbolic color is lavender purple. It was opened as a part of the main line designated to connect Sapporo to cities in eastern Hokkaido, in August 1900. After another more direct line was opened in November 1913, it was no longer a part of the main line but redesignated as a local line named Furano Line. Especially during lavender season, many travelers ride this line for sight-seeing, aboard the Norokko train, which is suitable for Geo-Tetsu tour with its wide-view coaches pulled by a diesel locomotive. This train is popular with not only domestic travelers but also travelers from overseas. Furthermore there are many museums of natural science and geology along this line, so we recommend this line to enjoy the Geo-Tetsu.

(2) The rich geological and sight-seeing resources of the Furano Line

The Furano Line runs from north to south, in the geological boundary area of Hidaka belt and Sorachi-Ezo belt in the center of Hokkaido. Pyroclastic plateaus lay along the middle of the line between Biei station and Kamifurano station via Bibaushi station, where the railway goes up and down steeply with many curves. These plateaus are well known for their beautiful hills and consist of material erupted and deposited 1~2 million years ago from Tokachidake volcano (2077m). The material is welded tuff, called Biei-Nanseki by locals, which is used for the stone walls of Biei station. On 24 May 1926, Tokachidake volcano erupted volcanic material, and melted snow to cause a snowmelt type mudflow along the valley toward Kamifurano town. It was a big disaster and many people suffered. Ayako Miura composed two novels of this disaster. Tokachidake volcano is still active, but it provides many natural resources such as Sirogane and Tokachidake spa., Shirohigenotaki waterfall and formerly mining of sulfur. When the train runs from Kamihurano to Nakafurano station, the beautiful hills and Tokachidake mountain range behind the hills are seen on the left, and lavender fields are visible on the right. At the end of the Geo-Tetsu tour of the Furano Line, we can see mount Namako that appears as a low and long hill heaved up by active faults. The last station of this line is Furano station, where we can transfer to the Nemuro line, which runs westward and southward along the Furano basin.

Keywords: Geo-Tetsu, Geo -point, Furano Line, Tokachidake volcano, Pyroclastic prateau, Snowmelt type mudflow

Railroad Geotourism in Itoigawa Global Geopark, Part 1: JR Oito Line

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¹Fossa Magna Museum

Earth science from the railroad train window

"The earth science from the railroad train window" of Japan originated 70 years ago by Tetsugoro Wakimizu. He wrote "Nature which was seen from the train window, Tokaido" (1942) and "Nature which was seen from the train window, San-yodo" (1944) which explained geology, geography, soil, agriculture, etc. which are visible from a railroad train window.

Rail road and Itoigawa Global Geopark

In the Itoigawa Global Geopark (IGGP), the railroad is regarded as a means to study and enjoy a geopark instead of a mere transportation device. IGGP has many inheritances related to a railroad. The steam locomotive Kurohime-go in front of Fossa Magna Museum was used till 1982 with the narrow-gauge railway for conveyance from the Japanese acid clay factory to Itoigawa Station. The brick made about 100 years ago in Itoigawa was used for the bridge pier of Hokuriku Line, the tunnel, etc. The brick garage was built at Itoigawa Station in 1912. Although remained as a landmark of Itoigawa Station till 2010, also regrettably, it was removed by Hokuriku Shinkansen construction. In order to use for the new Itoigawa station building to be opened in the spring of 2015, a part of brick garage is cut off and saved.

About Oito Line

JR Oito Line is a railroad which connects 105.4 km from Itoigawa Station to Matsumoto Station. Although between Itoigawa Station and Nechi Station was opened for traffic in 1934 and it was extended to Kotaki Station next year, it was in 1957 to have been opened for traffic between Kotaki Station and Nakatsuchi Station for steep geographical feature. In IGGP, the Oito Line is geosite called "the Himekawa gorge (Oito Line) Geosite". In this geosite, calm geotour of an average of 35 km/h can be enjoyed for 20.4 km from Itoigawa Station to Hiraiwa Station for entrainment time about 35 minutes.

The Oito Line is mostly parallel with Itoigawa Shizuoka Tectonic Line, Himekawa River, and the salt trail. The north Alps of the Southwestern Japan, the mountains of the Nishikubiki mountain land of Northeastern Japan and a Fossa Magna area, and the flow of Himekawa can be seen from a train window. Since Oito Line passes along the area of steep and weak geology, it has suffered many natural disasters. Especially, for 7.11 flood damage in 1995, it suffered serious damage, and by the time between Kotaki Station and Minami-Otari Station was restored, it took in two years or more.

The highlight from a train window

Itoigawa Station (altitude of 5 m)

Much jade from Itoigawa is around a station. Exposure exhibition of the jewelry of the station front is only here in Japan.

Himekawa Station (32 m)

It is the station made at the end by the JNR age. The steam of a hot spring can be seen.

Kubiki-Ono Station (49 m)

Mt. Kurohimeyama which consist of a limestone of the Carboniferous to Permian can be seen. The cut for road called Utou of the salt trail is in about 2 km of south directions.

Nechi Station (90m)

It is on foot 10 minutes to the Fossa Magna Park which can inspect a Major fault and giant pillow lava. You can see Mt. Komagatake which consists of andesite.

Kotaki Station (134m)

You can see Mt. Myojosan which consists of limestone. There is about 5 km to the place where jade was first discovered in Japan in 1938.

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MIS32-P14

Room:Convention Hall

Time:May 21 12:15-13:15

Hiraiwa Station (263m)

You can enjoy the scene of the Himekawa ravine from a train window. Here, it is the section which Oito Line runs at 25 km/h. It is an entrance to Renge hot spring and Mt. Shiroumadake.

Geopark activities using the Oito Line

The JR West Japan Co. operated around the Geopark train (Geopark-Go) at the time of abolition of the KiHa 52 series (diesel multiple unit) in 2010. Within the train, explanation of the scenery from the train window by the curator of Fossa Magna Museum was given. In the Kotaki walking which inspects around the Kotaki Jade Gorge performed every year, participation by car is avoided and it recommends gathering using the Oito Line.

Keywords: geotourism, railroad, Itoigawa, Geopark, Oito Line, train window

A scientific education program conducted by linking with the geophysical field works at Tottori Sand dunes, San'in Kaigan

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The students in our university, in general, seem to be much interested in the subjects concerned with the Earth science field. As the result, introductory lectures related to Earth sciences aiming at mainly the first-year students are popular in our university. However, most of the students did not have any opportunities to have 'chigaku' classes in their high school : only a few percentage of the students have experienced 'chigaku' classes. We have faced some problems of the educational system to encourage students who want to know something about natural phenomena and the background.

The Earth Scientific research program supported by the local government has been started and carried out in order to clarify the subsurface structure, hydrological cycle and water environment at Tottori Sand dunes, one of the Geosites in San'in Kaigan Geopark. On the basis of the research discovery, geophysical fieldworks have also been conducted by strongly linking with the scientific education program, in partnership with the local government and the related organizations. This activity has following three purposes; (1) to be deeply impressed, feel fun and be relaxed by touching nature, (2) to be satisfied by understanding its theoretical background and (3) to realize by him/herself that it is important to attain his/her physical and mental growth through nature.

In this paper, I present some new observation results derived from the geophysical investigations at Tottori Sand dunes, Geosite in San'in Kaigan Geopark and introduce a scientific education program conducted by linking with them.

Keywords: San'in Kaigan Geopark, Tottori Sand Dunes, field works, Earth Science education

Report on the 2nd Japanese Geoparks Network Conference 2011 in Toya-Usu Global Geopark

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The Second Japanese Geoparks Network Conference 2011 in Toya-Usu Global Geopark (abbr. JGNC2) was held in the resort city Toyako-Onsen, Toyako-cho, Hokkaido, Japan during September 29 through October 1, 2011. This was the great challenging opportunity for the Toya Caldera and Usu Volcano Global Geopark (abbr. TUGG) to summarize the state of the art of the past 3 years efforts since the TUGG certification (one of the three first GGNs in Japan) in 2009.

Learning from the previous pioneering first JGNC1 in Itoigawa Global Geopark in 2010, the Organizing Committee (chaired by T. Maya, the Toyako-cho Mayor) established the Executive Committee of JGNC2 led by the Chairman S. Mimatsu, and three Sub-Committees (Science SC led by N. Oshima, Welcome SC. led by M. Ano, and Geotour SC. led by Y. Ogawa).

Various programs were executed prior as well as during the JGNC2. Detailed descriptions can be examined in the final "Report of the 2nd Japanese Geoparks Network Conference 2011 in Toya-Usu Global Geopark" (JGNC2 Executive Committee, 87p., 2012).

Main events were consist of (a) 4 Section Meetings (1. Geoparks and Tourism, 2. Geoparks and Geohazards, 3. Geoparks and Education, and 4. Geoparks and Guides), (b) 4 Pre- and 4 Post Geotours, (c) Poster Session (86 posters), (d) Photo Exhibition, (e) Kids Programs (geo-festival and kids geotour), (f) Symposium (lectures by H. Okada and N. Oshima, Convenor M. Watanabe), (g) Invited Special Lecture by S. Kuramoto and Discussions (K. Ito, S. Mimatsu with S.K.) and (h) various JGN business meetings. 671 individuals were participated during the conference, and 800 for main event (symposium and lectures).

Early last year, we Japanese experienced awful natural disaster, the East Japan Tsunami Hazard on March 11, 2011, so, we offered a moment of silent prayer for the victims at the Opening Ceremony, and various considerations were placed through the program. In conclusion, in the final "Toyako-Usuzan Declaration" in October 30, 2011, we emphasized (a) further sustainable development through geo-tourism, (b) hazard mitigation efforts through educational activity, (c) creating safety culture on the basis of historical efforts, and (d) collaboration and further development of GGN/JGN.

Keywords: toya, usu, geopark, volcano, co-existence, disaster preventi