

The introduction of Universal Tourism for training and upskilling of the Geopark guide

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Keywords: Geopark, Guide, Universal Tourism : UT

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The Universal Tourism(UT), is a trip that was created so that everyone can enjoy, regardless of the presence or absence of constraints and elderly, with the aim of travel can participate without hesitation everyone. Skills of UT, is important not only development hard of Geotourism. We were investigated the training method to introduction of UT for the guide. On the other hand, the elderly is increasing in Geopark areas in Japan. Guide will also continue to aging. If we would adopt training method which introduced UT for guide, it would be benefit the tourists and resident.

Fundamental Study of Geoparks and Geotourism

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Keywords: Geopark, Geotourism, sustainable regional development

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The primary objective of this writing is to clarify what Geopark is and what the characteristics of Geotourism are, which have been developed in Geopark, to provide further predictive insights into various issues for progressions in both.

In concrete, on promoting Geopark and Geotourism, we considered points to keep in mind comparing with other kinds of tourisms such as tourism for the history or world heritage, also the current conditions and problems about enhancement of geoscience and physical geography education which are essential for promotion of Geopark.



第1図 日本ジオパークの分布

Figure1. Location of geoparks in Japan.

2013年4月現在。日本ジオパークネットワークのホームページをもとに筆者が作成。

図 日本におけるジオパークの分布(2013年4月現在)

Environmental Activity Part II (Our club has contributed to the environmental protection.)

Haruna Egami, Rio Fujimoto, Saki Hirose, Sayo Hasiradani, Ohtomo Yurina, Jyuri Hirai, Sumire Fukui, Nozomi Tabata, Tomomi Tanaka, Mayo Murao, Kana Kawato, Rika Tanaka, Toshihiro Iwamoto (Hyogop-Prf Toyooka Sogo High School Inter Act Club)

Keywords: Geopark, Eastern Japan Great Earthquake, Sanin Kaigan, Genbudou Park, Volunteer, Environment, Garbage, No agrochemicals, Tourism

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In April 2010, the Toyooka Sogo high school inter act club started. For the purpose of local contribution, social service, international understanding, We perform the volunteer activity in the area, Eastern Japan great earthquake disaster support activity. We work on cleaning as environmental activity among other things. Around school and a city area, a park, a neighborhood kindergarden, cleaning in the staying alone old man's house, weeding, a snow shovel go. We work on cleaning at Genbudo Park of the San-in Coast Geopark, the Takeno Beach, the Imago-beach and etc.



**History of flood disasters and Aquatic environment change
by excavation the Old-Hikoshi River,
based on core sediment analysis of Lake Hanare, Kyoto Prefectures**

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Keywords: Lake Hanare, flood disaster, environment change, core sediment analysis

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Lake Hanare is located in northern Kyoto Prefecture, Japan. The trend of the diatom assemblages was investigated with core sediment of Lake Hanare, conducted with the history of flood disasters and aquatic environment changes. As the result of the diatom analysis, the upper part of the core in 0.1-0.3m is represented by *Cyclotella meneghiniana* of 98.7%. On the other hand, *Fragilaria sp.* and *Ulnaria delicatissima* are the dominant species on other parts. At the lower part of the core, the predominant genera are *Aulacoseira*. Environmental research on core sediment analysis has suggested that the Old Hikoshi River changed the aquatic environment by the countermeasure against flooding in 1676.

The communication between geographers and local people in a geo guided tour: A case study of San'in Kaigan Global Geopark

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Keywords: geo guided tour, communication, geographers, local people, Tajima Region

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A field trip entitled 'San'in Kaigan Geopark: geological features, the natural environment, people's live and the formation of the sea of Japan' was conducted at the time of the Study Meeting of the Association of Japanese Geographers of October, 2012. Two young geographers organized the two-day field trip. One is a member of the Commission of Geoparks, and the other is a member of the Research Group for Geography of Agriculture and Rural Areas. Both of them are academic staff members of the San'in Kaigan Global Geopark.

The aim of the trip was to explore some geosites, including natural landscapes and cultural settings, and to discuss the significance of the geopark movement in North Tajima Region, the northern part of Hyogo Prefecture. Ten participants visited geological sites, such as Genbu-do Cave, Kannabe Highland and Tajima Miho-no-ura (one of the most famous and beautiful rocky coasts in the geopark) . They then visited some cultural sites, such as Yumura Hot Spring Resort, Amarube Bridge, and Ojiro Valley (the homeland of 'Wagyu', Japanese Cattle). Many local people served as geo guides.

During the field trip, many geographers communicated with local people. Some gave academic advice to them. Others were surprised at the high-quality interpretations that they offered. In the poster session, we will show you the meaning of communication between geographers and local people on the field trip.

Periphytic diatom flora of Koyama-ike pond, Tottori Prefecture, Japan

Masaaki Hirota (Tansaibou-no-kai), Yasuo Kihara (Tansaibou-no-kai),

Shigehiko Arita (Tansaibou-no-kai), Taisuke Ohtsuka (Lake Biwa Museum)

Keywords: diatom flora, Koyama-ike pond, *Gomphonema*, *Navicula*, *Nitzschia*

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We studied the diatom flora of the Koyama-ike pond located in Tottori Prefecture in western Honshu, Japan. The pond is a closed lagoon facing to the Japan Sea. Diatoms were monthly collected from cedar board set in the four stations near the pond shore from February 2010 to January 2011. The water was fresh to slightly brackish during the sampling period. A total of 225 diatom species belonging to 67 genera were found, but 18 species among them have not been identified. The predominant genera were *Navicula*, *Nitzschia* and *Gomphonema* represented by 27, 24 and 18 species, respectively. Our diatom flora does not always accord to the past studies in 1960's when the pond salinity was mostly the same as our sampling period. This difference may be partly attributed to the eutrophication meanwhile.

Preserving Sanin Kaigan Geopark

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Keywords: Actions to protect environment

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We at Kasumi High School, located in Hyogo prefecture, take many actions around Sanin Kaigan Geopark to preserve its valuable nature. We check what is happening at the geo site, how many species are living there, breeding activity, and try to protect the environment. We feel that the Geopark provides us with many benefits in our daily lives.

We want to keep protecting the Geopark while using it as a place for students to study the environment. Even though each of our actions might be small and may not have much influence, we would like to pass down the knowledge we got from our elders to the younger generations.

We want to continue being conscious of the fact that we live near a very valuable source of environmental study and we want to learn more about it for our future.



Ecosystem of a Ramsar



Footprint Fossil



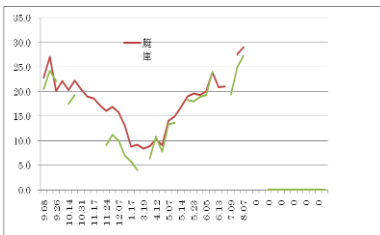
Aquatic Life Observation



The Geo Site Observation



Checking the Water pH



The Change of the Water Temperature



Garbage that Washed Up on Shore Survey



Cleaning Activity



Tree Planting Activity



Plant Ayu in a river



Capturing Ayu to be bred



Artificial Impregnation of Ayu

Sanriku Geopark promotion activities utilizing popular TV drama “Amachan”

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Keywords: Geopark, Promotion

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Popular serial TV drama “Amachan”, produced and aired by NHK (Japan Broadcasting Corporation), was filmed in Kuji city, which is located on the northern part of the Sanriku Geopark. The latter part of the drama features the Great East Japan Earthquake and Tsunami, and characters’ struggle to recover from the disaster. This drama has a positive impact on tourism promotion and is attracting the drama fans to Sanriku area. We prepared display boards that show visitors the Sanriku Geopark attraction related with the drama for them to enjoy.



図1 三陸ジオパーク推進協議会HPのリンクバナー

San'in Kaigan Geopark Tourism Promotion By Female Bloggers

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Keywords: San'in Kaigan Geopark, Model Tours for Women, geotourism, Female Bloggers

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While there is a strong trend among independent travelers to gather information and plan trips within Japan through the use of the internet and word-of-mouth information, there is a lack of information regarding geotourism available online. In response to this situation, a number of San'in Kaigan Geopark model tours were operated in Tottori Prefecture. These were promoted by female bloggers who are popular and influential in the independent tourism market. In 2012, a total of 35 female bloggers established their own themes and planned trips to the San'in Kaigan Geopark. Each blogger posted their travel reports on their blog sites and on twitter. At the same time, a "San'in Kaigan Geopark Model Tours for Women" facebook page was established so that each of the travel reports could be posted and shared. As a result of this continual availability of travel information, San'in Kaigan Geopark related pages received a high number of online hits, and increased awareness and popularity regarding the Geopark was achieved.

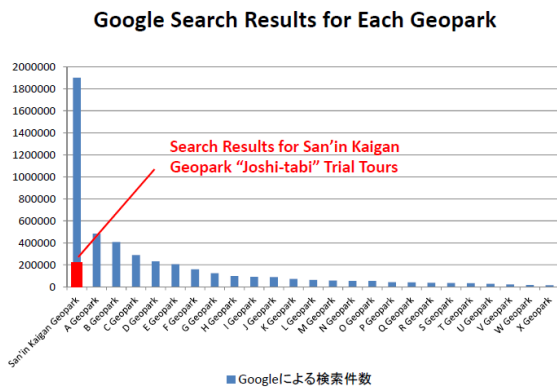


図1 Googleによる各ジオパークの検索件数



写真1 女子旅モニターツアーの Facebook ページ

Study of thermal effects range to the host rock by the dike intrusion using the paleomagnetic measurement and numerical analysis

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Keywords: dyke, thermal effect, paleomagnetism, simulation

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Dikes and sheets are formed by magma intrusion. This study is intended to reveal the extent of the impact of heat to give the host rock by dike intrusion from both methods of paleomagnetic and numerical analysis. Measurement the residual magnetization of gneiss in the conglomerate layer of the host rock and the dike (width 4m80cm) at Asamogawa, Kyotango, Kyoto Prefecture have been carried out. Gravel in conglomerate layer must show a random magnetization direction from the process of their formation. But it has a magnetization in the same direction as the dike to the extent that the temperature rises in response to the heat penetration during the dyke is expected. In addition, We analyzed by the Crank-Nicolson method diffusion equation two-dimensional heat. Paleomagnetic measurements with step-wise thermal demagnetization show that re-heating range within 20cm from the boundary of dyke and host rock up to 600 °C, and up to 500 °C within 60cm. Numerical analysis shows heat of dyke intrusion continue one week to one month to explain the paleomagnetic results.

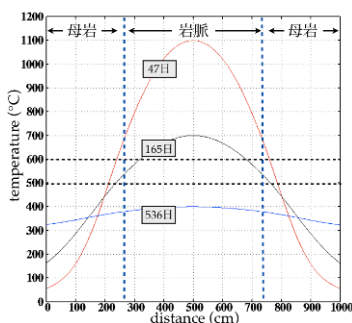


図 数值計算結果

Formation process of the Shotenkyo sandbar from estimation of shallow subsurface structure using electromagnetic exploration

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Keywords: Shotenkyo sandbar, resistivity, Formation process

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Various coastal topography is one of the character in the San-in Kaigan Geopark. Sandbank may formed by sea-level change in the glacial period and vertical movement of the land. We infer the formation process of the Shotenkyo Sandbar which is geo-site of the San-in Kaigan Geopark. Shallow subsurface geologic structure is estimated from resistivity structure inferred from apparent resistivity and the phase difference by VLF-MT method. Subsurface structure is estimated about 4km long along the coast line. We made it clear that the depression is exist at three places on the basement strata. We considered as follows: the process of forming the Shotenkyo Sandbar by previous research and measurement results. At 20 000 years ago, the river that flows through the bay back part, was flowing east of the sandbar. Then, sandbar is formed along the terrain of ridges continued to west at the time due to the transgression. At the Jomon high sea-level period of about 6,000 years ago, sand dunes formed by the coastal current. The Sanotanigawa river blocked by the rise of sand, and then the flow path has changed the flow to the west. The Kumihamawan bay becomes a enclosed sea or a lake. New water outlet is formed at the western end of the sandbar, which is probably lower part of sandbank.

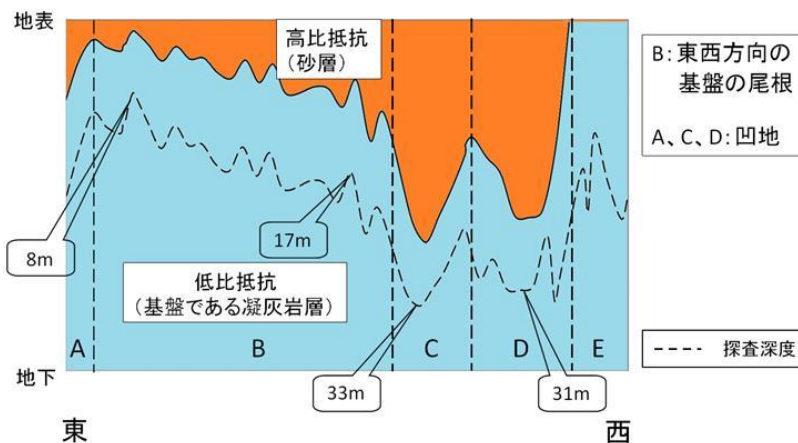


図 推定した地下構造断面

Efforts on education of disaster prevention at Hakusan Tedorigawa Geopark

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Keywords: Geopark, Disaster Prevention, Flood Damage, Sediment Disasters, Volcano,
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Although education of disaster prevention is one of the major topics at Hakusan Tedorigawa Geopark, there has been less progress compared with diffusion of the blessings of nature. In our geopark, disasters such as flood damage, sediment disasters, eruption of the Hakusan Volcano, earthquakes, and snow damage could be supposed but the residents show little interest in the disasters, especially volcano and earthquakes. In this presentation, we would like to sort out our geopark's activities on education of disaster prevention, and afterwards, discuss its problems and solutions.

Hakusan City, which composes Hakusan Tedorigawa Geopark, participates in Hakusan Volcano Disaster Prevention Council, which was established in March, 2013. In addition, Hakusan City has the Regional Plan for Disaster Prevention. Although this plan states the practical use of the geopark for the education of disaster prevention, there has been only less progress. On the other hand, however we incorporate disaster prevention into some of our experimental studies, lectures, and geo-tours, we could provide only less opportunities. Besides, we held some geo-tours visiting the heritages of natural disasters, but in most cases we had no choice but to cancel the tours because it didn't reach the minimum number of participants.

In order to promote the attitude to know and fear the disasters properly, we should take up disasters, the background of the blessings, every time in geo-tours and studies of the geopark in schools and public halls. We believe that this is the way to increase the interest on disaster prevention.

How did the Japanese Islands bend?

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Keywords: Japanese Islands, Fossa Magna, Expansion of the Sea of Japan,

Itoigawa-Shizuoka Tectonic Line, Analog Experiment, Flour

The experiment which reproduces bending of the Japanese Islands and the Fossa Magna by using flour was developed. It can reproduce the forming process of Fossa Magna in a laboratory.

Oue Cleaning Programs

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Hamasaka high school is in Shinonsen, in the north part of Hyogo Prefecture. This town is a part of the geo-park. Our town has many beautiful places – *Hamasaka Kenmin San Beach* designated as one of Japan’s 100 Best Beaches with White Sand and Green Pine, the pine grove called “the garden of pine (*Matsu no Niwa*)” near the beach. Moreover, we have “the water crowfoot park (*Baikamo Koen*).” You can enjoy and see the white and pure flowers there from May to August. We will introduce these places and give a presentation on our positive cleaning programs to maintain the beautiful scenery, cooperating with the local people in Shinonsen.

Pour Japanese broth over these dishes, and have a taste of Katsuyama: The Geopark Lunches “BOKKAKE”

Dinosaur Valley Fukui Katsuyama Geopark Promotion Council

Masaki Kawashima (Association of Kachiyama Bokkake), Takenori Hatanaka (Katsuyama City office), Yoshikawa Hirotsuke (Katsuyama Geopark advisor)

Keywords: Geopark, Bokkake, Food culture and Tradition, Local delicacies, Restaurant and food shop owners, Pour Japanese broth, Katsuyama product, Dinosaur, Excavation

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Local restaurants and food shops are currently focusing on creating special dishes and promoting their lunch menus for the 「Geopark Lunch 'BOKKAKE」 campaign. The following is an introduction to their activities.

1. What is traditional Bokkake?

Food culture and tradition

2. About the process of developing the new “BOKKAKE” lunch menus.

Evolution from the traditional Bokkake to the new BOKKAKE

3. The activities that are focused on restaurant and food shop owners.

Participating members/About the activities

4. A dish cannot be referred to as a “Geopark Lunch” if the storekeeper does not notify the Geopark about it.

5. Future development

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

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Keywords: Earthquake Heritage, Preservation and Utilization, Geopark, San'in Kaigan,
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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 (M6.8), the 1927 North Tango Earthquake (M7.3) and the 1943 Tottori Earthquake (M7.2). As such, our Geopark has many heritage sites related to epicentral earthquakes.

< 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 towns of Kinosaki hot springs and Toyooka 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. The death toll is recorded to have been 2,925. The epicenter of the Tottori Earthquake was part of Tottori city. 1,083 were killed, mainly in Tottori city.

< Earthquake Recovery and Epicentral Earthquake Heritage >

At the Kinosaki hot springs, 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.

< 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.

Some experiments on the liquefaction and vibration of building

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Noritaka MATSUBARA (Secretariat, San'in Kaigan Geopark Promotion Council)

Keywords: Earthquake, Liquefaction, Earthquake resistance, Seismic isolation, Sympathetic vibration

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Some educational programs using experimental devices on the liquefaction and vibration of building by the earthquake have been developed by the Museum of Nature and Human Activities, Hyogo. Liquefaction experimental devices using plastic bottle and sand were already provided by other researchers. They are compact and enable to show uplift phenomenon of manhole and sand boil in liquefaction by the earthquake. However, it is difficult to understand directly the liquefaction phenomenon with reality, because they are very simplified models. Then, we provided a small water tank with wet sand and vibrated it by portable massager, in addition to above mentioned plastic bottle experiments. Participants of seminar can understand the liquefaction phenomenon very well, through these experiments.

Portable vibration devices have been made to understand the earthquake resistance, seismic isolation and sympathetic vibration of buildings. These are all handmade and all parts can be purchased at DIY shop. Participants put the modified house on the vibration device and rotate the handle. They easily understand the manner of vibration of building by earthquake.

These experiment programs are enforced at Geo-Caravan and Geopark Festival in the San'in Kaigan Geopark.



Fig.1 Liquefaction experiment by water tank and portable massager explaining uplifting the manhole.



Fig.2 Liquefaction experiments at Geo-Caravan in Kotohiki-hama Singing Sand Museum.



Fig.3 Experiments on the vibration of buildings at Geo-Caravan in Kotohiki-hama Singing Sand Museum.

Study on relations of Toyooka Basin and the disaster

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The important concept in geoparks is “continuous local development”. To achieve this, we need to understand the geological feature and coexist with disaster. Considering both benefits and disaster brought about by the geological feature of the Toyooka Basin, we try to make a the hazard map based on the geologic point of view which leads to disaster prevention and decrease in disaster. There have been few studies which focused on both “disaster prevention” and “tourism”. Our goal is to make a sightseeing course in which we can enjoy and learn the Toyooka Basin’s geological feature that contributes to disaster prevention.

First, using fieldwork and documents, we analyze a geologic map of the Toyooka Basin and consider easiness of beginning of the disaster judging from a geology point of view. In addition, we collect records of “Hokutandaishinsai”, analyze it every area and collate it with a geologic map of the current Toyooka Basin and consider the association between real disaster and geological feature. In Toyooka city, there remains old geologies like natural levee, back marsh and monadnock. Old towns spread around natural levee and back marsh which are relatively strong to flood disaster because they are often on Genbudo’s basalt. Basalt is heavy and firm, and therefore basalt becomes a stable basis during flooding. Local people have known this feature and made good use of it. We can learn the geological development process around Toyooka, taking these basalt-basis landscapes into sightseeing spots. Learning lessons from “Hokutandaishinsai” that so many wooden houses were burned down in the aftermath fires, we now see the trace of the disaster in the form of reinforced concrete buildings throughout Toyooka city after the earthquake disaster reconstruction. We will use the hazard map based on the geologic point of view for Toyooka sightseeing tour, disaster prevention education, and geopark activities.