

## Muroto UNESCO Global Geopark

\*Takaaki Shirai<sup>1</sup>

### 1. Muroto Geopark Promotion Committee

Muroto UNESCO Global Geopark is a place where the "birth of the earth" through plate tectonics can be seen before the viewer's eyes. These sights include Paleogene-Neogene accretionary complex, marine terraces formed by sea-level changes through glaciation in the Quaternary and by continual coseismic crustal movements, and emergent coastal landforms associated with major earthquakes. Japan, located on an active margin where four tectonic plates interact, is one of the most earthquake-prone and volcanic countries in the world. Even in this environment, Muroto Geopark stands out as a representative area of the mobile belt. The Shimanto belt, which offered the first on-land proof of the theory of plate tectonics, can be observed up close. In addition, subduction zone earthquake which occur every 100 to 150 years, along with the concomitant rising of the earth's crust -which occurs at the astonishing rate of approximately 2 m every 1,000 years -have brought about remarkable topographical changes, with major impact on the lives and livelihoods of the area's inhabitants.

The special characteristics of Muroto UNESCO Global Geopark are not limited to its geological and geomorphological heritage; another major point is how these are utilized with such wisdom by the local inhabitants in sustaining their livelihoods. For example, agriculture thrives on the level surfaces of the terraces, taking advantage of the topography, the soil's good drainage and long hours of sunlight. The land surface of Muroto is raised up by 1 to 2 m by subduction zone earthquakes. In the past, it has been necessary to re-excavate fishing ports in the area that shallowed after the earthquakes in order to put them back into operation. In this way, we see how Muroto is an area which functions as a locus of preparedness for the geohazards, a locus of strong resilience after disasters, and a locus of the application of resources that became available as a result of disasters.

In recent years, as a series of major earthquakes and tsunamis have occurred at the active margins, along with other large-scale geohazards such as volcanic eruptions, it has become apparent that Muroto UNESCO Global Geopark's mission is to tell the world how to live in a mobile belt, leaning from the people living in this drastically and constantly changing environment.

Keywords: geopark, geotourism, Muroto geopark

## Mt. Apoi Geopark

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### 1.Mt. Apoi geopark visitor center

Themes of Mt. Apoi Geopark is A Story of gifts from deep inside the earth connecting land and people together. Mt. Apoi is made up of peridotite that was thrust up from the depths of the earth by global-scale dynamic ground movement. Mt. Apoi Geopark is a stage featuring narratives that connect the planet's constitution, nature and people.

Sub- theme A: Peridotites- the interior and dynamic movement of the earth

The Hidaka Mountains formed as a result of a collision between two continental plates 13 million years ago. At that time, part of the mantle under the crust was thrust up onto the earth's surface to form the Horoman peridotite complex, which includes Mt. Apoi. The relatively fresh peridotites on and around the mountain contain valuable information from deep inside the earth's mantle, making them the subject of global attention. Mt. Apoi Geopark provides a variety of opportunities to learn about and enjoy phenomena relating to the earth's transformation. These include its status as the site of a plate collision, oddly shaped masses made of cooled and solidified magma, and rocks from far-off southern seas.

Sub- theme B: Alpine Plants- scarcity and the natural environment

Despite its low altitude, Mt. Apoi provides habitats for alpine vegetation due to its unique soil, weather and geographical conditions. Hidakaso (*Callianthemum miyabeanum*) and a host of other endemic species grow here, and the area's alpine plant communities have been collectively designated as a Special Natural Monument of Japan. In addition to alpine plants, the area is also home to the endemic Apoimaimai snail (*Paraegista apoiensis*) and Himechamadaraseseri (*Pyrgus malvae*; a butterfly not found anywhere else in Japan), as well as the Japanese pika (a relict species from the Ice Age). Mt. Apoi Geopark's valuable and diverse ecosystem provides opportunities to learn about and enjoy the natural environment.

Sub- theme C: Human History- the community of the nature and human life

The beautiful scenery of oddly shaped rocks (including masses called Oyako-iwa, Sobira-iwa and Cape Enrumu) along the Samani coast is a highlight of Hidaka's coastal road. Legends handed down by indigenous Ainu people in Samani, where Mt. Apoi Geopark is located, often feature these rocks. Cape Enrumu has long been known as a favorable natural harbor thanks to an ideal landform that shelters ships from strong winds, helping Samani to prosper as an important trading hub for Kitamaebune merchant vessels from the Edo period (1603 - 1868) onward. The rich history of people living with Mt. Apoi and the sea continues to the present day in Mt. Apoi Geopark, making it an ideal place to learn about and enjoy the symbiosis between humans and nature.

Keywords: geopark, geotourism, Mt. Apoi Geopark, peridotite, alpine plants

## The hidden volcano in Yuzawa Geopark

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### 1. Yuzawa Geopark Promotion Group

Yuzawa Geopark is located in the most southeastern part of Akita Prefecture, adjacent to Yamagata and Miyagi Prefectures. The Omonogawa River runs through the Yokote Basin between the Ou Mountains on the east and the Dewa-Kyuryo Hills on the west. The area alongside the Omonogawa River, the Minasegawa River, the Yakunaigawa River and the Takamatsu River, has been turned into highly productive rice paddies. There was the Innai-Ginzan Silver Mine in Yuzawa Geopark. The Mining probably started in the Edo Period. Many people came to work in the Innai-Ginzan. They drank many Japanese Sakes every night, so there was a great market for Japanese Sake in Innai-Ginzan. Japanese Sake production is one of the main local industries that benefit from Yuzawa's spring water. The Yuzawa City is home to Japanese Sake companies and breweries. The Yuzawa City use geothermal resources: the hot spring and the geothermal power generation. There is no active volcano, but there is the gift of the hidden volcano in Yuzawa Geopark. Let's look for the hidden volcano of Yuzawa Geopark.

Keywords: Geopark, Geotourism, Yuzawa Geopark

## Choshi Geopark

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### 1.Choshi Geopark Citizen Party

Choshi Geopark is located at the easternmost tip of the Kanto Plains, about 100km away from Tokyo. It covers the entire city of Choshi and looks like a peninsula surrounded by the Pacific Ocean to the east and south, with the Tone River to the north. Choshi has been famous for fishery, agriculture of vegetables such as cabbages, and soy sauce manufacturing.

Many geological features can be observed at the geosites such as Inuiwa Rock (a dog-shaped huge rock created by accretionary complex of the Jurassic), Cape Inubosaki (sedimentary rocks of the Lower Cretaceous), and Byobugaura Cliff (a 10km long cliff created by the Quaternary sedimentary strata and coastal erosion).

At the top of Mt. Atagoyama, visitors can enjoy viewing spectacular landscapes. Looking over the entire scenery of Choshi Geopark, they can imagine and learn its mechanism of geological and topographical condition, as well as the lives of people from the past to the present in this area.

Keywords: geopark, geotourism, choshi geopark

## Mine-Akiyoshidai Karst Plateau Geopark

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### 1.Mine-Akiyoshidai Karst Plateau Geopark Promotion Council

Mine-Akiyoshidai Karst Plateau Geopark is located in Mine city in the western part of Yamaguchi Prefecture. The most attractive site of the area is the karst plateau "Akiyoshidai" largest in Japan in our area central part. Because limestone is dissolved by acidic water, a limestone pillar and a doline (conical hollow) develop in the Akiyoshidai. The inhabitants have lived on the karst plateau since olden days.

The limestone which forms the karst plateau originated from coral reef of oceanic island. The oceanic island moved with an oceanic plate and accreted under a continental plate finally. In fact, most of the Japanese Islands are made with the same structure. Therefore, it leads to knowing the constitution of the Japanese Islands to know the constitution of the Akiyoshidai. This is very important for us who live in the Japanese Islands located in humid and tectonically active terrain. If you are interested in the Mine-Akiyoshidai Karst Plateau Geopark to listen to my presentation, I hope that you come to our geopark!

Keywords: geopark, geotourism, Mine-Akiyoshidai Karst Plateau Geopark, karst plateau, limestone

Volcano Gift from the South - Let's go to the Izu Peninsula Geopark!

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#### 1. Izu Peninsula Geopark Promotion Council

Izu Peninsula is the only part located on the Philippine Sea Plate in Honshu. This part was originally a group of volcanic islands and submarine volcanoes in the South Seas. These islands and volcanoes drifted by the northward motion of the Philippine Sea Plate and collided with Honshu island (the main island of Japan) about 600,000 years ago to form a peninsula. Even now, volcanic activity and crustal movements continue in this peninsula. As a result, various "Gifts" of nature such as abundant hot springs, spring water and natural scenery are enjoyed by the people of the peninsula.

Keywords: Geopark, Geotourism, Izu Peninsula Geopark