The prefecture's key functions concentrate all over the foothills.

Around Mount Tarumae, there are major cities of the central region of Hokkaido, including the City of Tomakomai, and a concentration of the infrastructure which supports economic activities in the prefecture, such as railroads, freeways, the Port of Tomakomai, industrial parks, and New Chitose Airport.

Along the Nishitappu River in the City of Tomakomai

Urban area of Shiraoi-cho

Ferry terminal at the Port of Tomakomai

Tomakomai West Port

New Chitose Airport

Fumarole at the summit

For Creating Harmony with Nature

Hokkaido Development Bureau

Muroran Development and Construction Department
1-14, Irie-cho, Muroran 051-0023
Phone: 0143-22-9171

2003.8.@500

Volcanic Sabo Project at Tarumae Volcano

We just face to the crisis of Volcanic disaster due to eruption of Tarumae Volcano

Imminent danger of catastrophic eruption

Gully erosions in the areas surrounding Tarumae Volcano

Repeated occurrence of massive sediment disasters

Anxiety builds daily concerning the possibility of eruptions and sediment disasters in the areas surrounding Tarumae Volcano.

Alluvial fans of Tarumae Volcano had soft grounds due to consist of pyroclastics materials and peats.

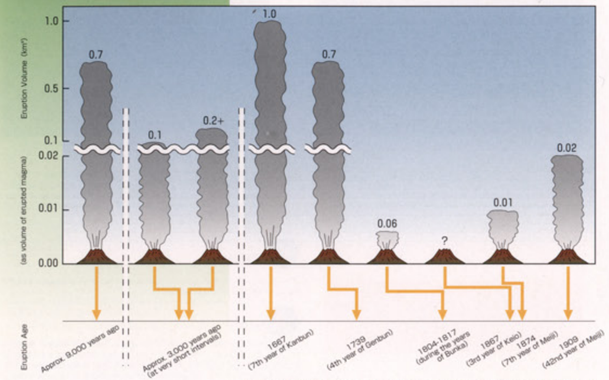
As the volcanic ejecta deposited unstably in the foothills and surrounding areas, much of the ground has been eroded.

Surrounding area of Tarumae Volcano have heavy rainfall.

The areas around Mount Tarumae have one of the highest rainfalls in Hokkaido.
Heavy rains or melting snow in spring often causes sediment disasters.

Before eruption.

In many of the past Sabo projects, measures were taken after volcanic eruptions occurred, which is likely to have increased the damage. In this project at Mount Tarumae, pre-emptive measures thought to be important in order to lessen the damage of a volcanic eruption, have been implemented since fiscal 1994 (the sixth year of Heisei).



History of Volcanic Eruptions at Tarumae Volcano
(Dates according to Katsui & Ishikawa(1988) and Suzuki (1944)

TARUMAE SAN SABO

if the possible disasters would be generated as the same size as 1739 eruption.
It is estimated the catastrophic damages will be given to the surrounding areas.

Estimated damage

If a massive volcanic eruption on the scale of the 1739 eruption were to occur today, the extent of damage to the surrounding areas would far outstrip anyone's imagination. Tomakomai City - the basins of the Oboppu River, the Nishitappu River, and the Tomakomai River - would be totally engulfed by the resulting muddy torrent. Such a disaster would also affect railroads, expressways, airports, ports, and harbors, which support daily life and industry in Hokkaido, potentially paralyzing all civil functions in Hokkaido!

The 1909 eruption

TARUMAE SAN SABO

To prevent the Volcanic mudflow disaster.

Damage caused by mudflow triggered by the 2000 eruption of Usu Volcano

A mudflow triggered by the eruption of Mt. Tarumae would cause tremendous damage. To minimize the extent of such damage, we plan to build a series of erosion control facilities, such as reinforcement works, erosion control dams, and sand pockets. To provide backup for the evacuation alert system of the region, we will install monitoring equipment, such as mudflow sensors.

What are snowmelt-generated volcanic mudflows?

Water released by sudden snowmelt on the flanks of a volcano will turn into sediment-water flow as it picks up debris from the mountain slopes. Such volcanic mudflows can be several hundred times more massive than a debris flow triggered by rainfall.

The Mount Unzen (Fugendake), and the Nakao River, where the latest technologies are applied

The steel (cell-type) Dam works, which has been built at the upper reaches of the old Dam works location,is characterized by short term of construction,low cost,and the adaptability on soft ground These technologies are also applied to the Oboppu River and Nishitappu River.

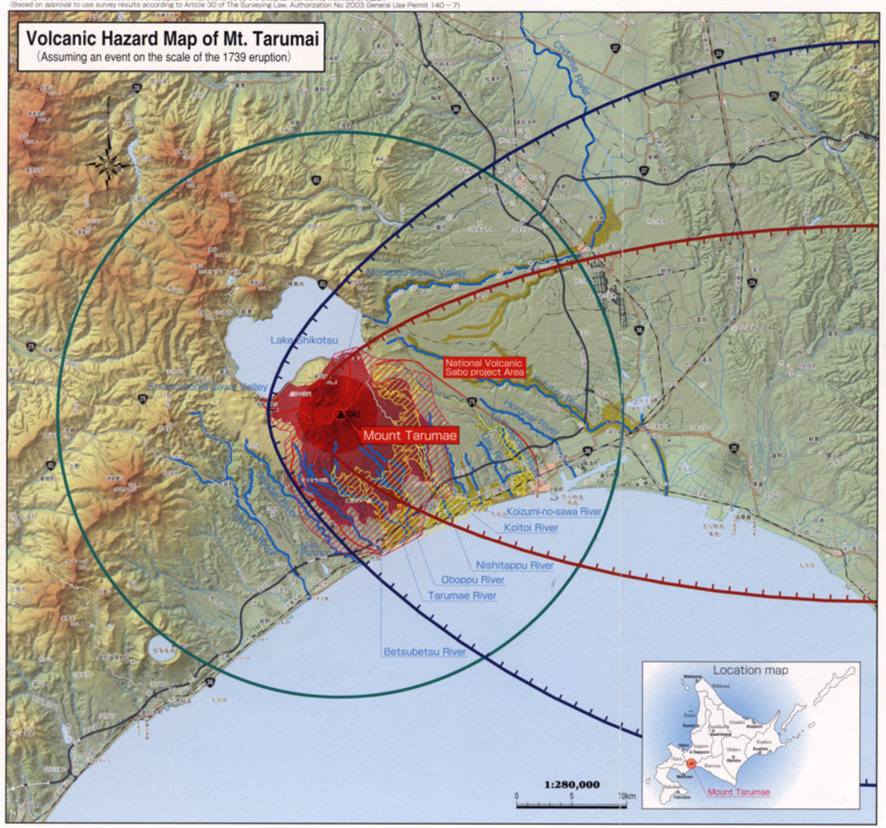
Question

Why is the same scale as the volcanic eruption of 1739(August of the eighth year of Genbun) predicted?

Answer

As a basic model, the Volcanic Sabo Project at Tarumae Volcano assumes an event on the order of the 1739 eruption, which released a total eruption volume of 1 billion cubic meters (approximately 800 times the volume of the Tokyo Dome). This event is selected from all eruptions in Tarumae Volcano's history due to its scale and the extent of damage it caused to surrounding areas. Given the importance of the areas surrounding Tarumae Volcano, we are obligated to assume worst-case scenarios.

This map was based on the 1:25,000-scale topographic map published by the Geographical Survey Institute of Japan.
(Based on approval to use survey results according to Article 30 of The Surveying Law. Authorization No. 2003 General Use Permit 140 – 7)



Legend

An eruption equal to the 1739 eruption may generate the following hazards:

Pyroclastic flow

- Extremely dangerous — areas almost certain to be in the primary course of pyroclastic flow
- Highly dangerous — areas very likely to be within the path of the lead wave generated by pyroclastic flow

Volcanic blocks

- Extremely dangerous — areas almost certain to be subject to fallout of blocks greater than 1.5 m in diameter.

Volcanic ash deposits

- Highly dangerous — during periods of west winds — areas very likely to be subject to ash deposits greater than 100 cm
- Moderately dangerous — during periods of west winds — areas likely to be subject to ash deposits greater than 25cm. Regions outside this area may also experience ash deposits.
- Winds other than west winds — Areas that may experience ash deposits greater than 100 cm, depending on wind direction. Regions outside this area may also experience ash deposits greater than 25 cm.

Mudflow and Debris Flow

- During seasons with snow cover — Extremely dangerous — Areas likely to be in the direct path of mudflows triggered by snow melted by pyroclastic flow
- In regions where ash is deposited (during periods of west winds) — Highly dangerous — areas that may be in the direct path of mudflow and debris flow during rain. * Areas in danger are subject to change depending on the distribution of ash deposits, and valleys other than those designated here may be affected as well.

TARUMAE SAN SABO

Volcanic Sabo project at Tarumae Volcano

Volcanic Sabo project at Tarumae Volcano started in fiscal 1994 (the sixth year of Heisei). We predict that debris will flow down the streams on the foothills of Mount Tarumae when a volcanic eruption occurs.Therefore, we build facilites for volcanic sabo protection along the seven major streams.
At first, we started to build along the Obcppu River, where the elevation is the lowest among the rivers around Mount Tarumae.

The middle reaches of the Obcppu River, where the deposittions are piled up (and water flows under pumice layer).

The upper reaches (headwaters) of the Obcppu River

Oboppu No.3 Sand pocket

Rendering of the Nishitappu No.2 Sand pocket

Question

Will a pyroclastic flow occur at Mount Tarumae?

Answer

Yes, in the past eruptions, pyroclastic flows have occured at Tarumae, too.
Koke-no-Domon (a moss-draped cave) and Tarumae-Garo (a small canyon) are narrow valleys of phreoclastic flow deposit which formed during the process of gradual erosion due to such as rain.
A pyroclastic flow is a stream of heated gas, volcanic ash, and pumice stone belched from a crater and running down the hillside.
Those which occurred in the Unzen Fugendake Mountains kept a temperature of hundreds of degrees centigrade, and flowed down at a speed of up to 100 kirometers an hour.The pyroclastic flow is one of the most dangerous phenomena in a volcanic eruption. It will be too late to run away from after encountering it.
Therefore, meteorological observatories; the institute of Seismology and Volcanology, the Faculty of Science, Hokkaido University; the Hokkaido prefectural government; and the governments of municipalities around Mount Tarumae (the City of Tomakomai, Shiraoi-cho, the City of Chitose, and the City of Eniwa) cooperate with each other in taking disaster measures.

The Oboppu River Nature Trail

Each year, the Muroran Development Construction Department and the Tomakomai City Science Museum invite children and parents - about 100 perticipants in all - to explore the areas around the Obcppu River sand pocket, with the goal of increasing awareness of the Tarumai Volcano, of surrounding areas, and of disaster prevention techniques.