



First Circular

IAVCEI



Commission on the Chemistry of Volcanic Gases

Gas workshop in Hokkaido, Japan, September 2025



Tarumae volcano



Invitation

On behalf of the Commission on the Chemistry of Volcanic Gases (CCVG) of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI), we are pleased to invite the international geochemical community working on volcanic gases to participate in the 15th CCVG workshop in Hokkaido, Japan, in early September 2025.

The main aims of the workshop are to share and discuss recent developments in observation techniques, results and interpretations. Three core activities of the workshop will be: (1) gas composition measurements using direct sampling and sensor techniques, (2) plume measurements using remote sensing techniques, and (3) soil degassing surveillance.

The workshop will include two days of scientific meetings followed by three days of field observations. The field observations will be made at Kuttara volcano, then at Usu volcano and/or Tarumae volcano (selective).

Scientific Program

We hope the conference will be an opportunity to represent a wide range of scientific activities around the study of volcanic gases. As a guide, we aim to organize the presentations around the following topics: (1) geochemistry of magmatic gases and fluxes, (2) new observational techniques, (3) atmospheric chemistry of volcanic plumes, and (4) interpretation and modeling of volcanic processes with complementary datasets.



Field campaigns:

1. Direct sampling of gas or hot springs (Kuttara, Tarumae, Usu)
2. Volcanic gas composition measurements using Multi-GAS or other sensor systems (Kuttara, Tarumae)
3. Plume measurements using UV remote sensing techniques such as DOAS (Tarumae)
4. Measurements of diffuse soil degassing especially CO₂ (Usu)

Venue and logistics

Hokkaido is the northernmost and second largest island in Japan (Fig. 1). The population is more than 5 million; the area is about 80 thousand km². Hokkaido is known as the coldest region in Japan. The temperature in early September is 15-30°C. The temperature may be cooler in the mountains.

The conference will be held in Sapporo (Fig. 1), the capital of Hokkaido with nearly 2 million population. Sapporo is a very popular destination for tourists traveling to Hokkaido.

The common way to travel to this island is by airplane from other parts of Japan. The main airport named ‘New

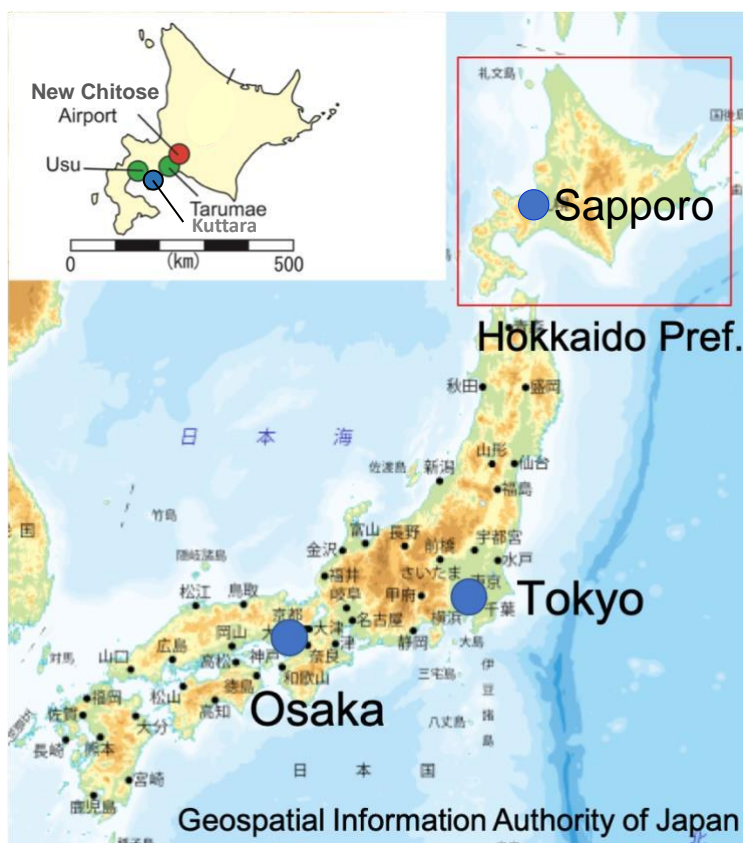


Fig. 1. Map of Japan and Hokkaido.



Chitose Airport' is located at Chitose, close to Sapporo city. You can find airplanes to the airport from major Japanese international airports. You can also fly to the airport directly from major east Asian cities. The airport and the city center of Sapporo are connected by trains and buses. The train runs every ~15 minutes during the daytime and takes about 40 minutes to Sapporo station (the main station).

There are many mountains and volcanic plateaus on the island, including active volcanoes such as Usu, Tarumae, Tokachi, and Meakan. During this workshop, the field observations will be made at Kuttara, Tarumae and Usu volcanoes.

Kuttara volcano



Fig.2. Oyunuma geothermal pond (left) and Hiyoriyama fumarole (right).

Kuttara volcano is a basaltic to andesitic volcano, located within the Shikotsu-Toya National Park (Fig. 1). It features a 3 km diameter caldera lake and is accompanied by the post-caldera volcano, Noboribetsu volcano, on its western flank. Noboribetsu volcano contains several phreatic eruption craters and a dacitic lava dome called Hiyoriyama (Fig.2). Fumarolic and hydrothermal activities can be observed at Hiyoriyama and within the craters, respectively (Fig.



2). The fumarole at Hiyoriyama is 130~140°C with hydrothermal gas based composition. We will be able to conduct fumarole and water sampling or Multi-GAS measurements. Unfortunately, SO₂ measurements with UV spectrometers are not possible at this volcano.

Tarumae volcano



Fig.3. Scenery of fumarolic areas A and B at Tarumae volcano, Japan.

Tarumae volcano is an andesitic volcano located in southern-west parts of Hokkaido, belonging to the Shikotsu-Toya National Park (Fig. 1). The altitude is 1041 m a.s.l. This volcano has a lava dome (cover photo) and two active fumarolic areas (named A and B) around the dome (Fig. 3). Last eruptions were phreatic ones in 1978, 1979, and 1981. It will take about one hour by foot to reach the fumaroles from a parking lot.

The fumarolic area A emits high-temperature (500-600°C) gases. It is easy to reach and feasible for direct gas sampling and Multi-GAS. The SO₂ flux from the fumarolic area A is estimated to be 2-5 tons/day, suited for measurements by the walking traverse or SO₂ camera.

The fumarolic area B locates on the opposite side of the dome from fumarolic area A. The temperature of fumarolic area B is 300-400°C; the SO₂ flux from the area is estimated to be less



than 0.1 tons/day. Because of the slope, this fumarolic area is relatively tough to reach. Direct gas sampling and Multi-GAS measurements are feasible at this area. The walking traverse will be a good option to measure SO₂ flux, while the SO₂ camera measurements may not be able to be conducted because of the location of the fumaroles.

Usu volcano



Fig. 4. Inside the crater of Usu volcano with a view of Ko-Usu dome (left). A part of I-crater fumarolic area (right).

Usu volcano is a dacitic volcano formed at the southern rim of Toya caldera in western Hokkaido (Fig. 1). The altitude is 737 m a.s.l. Usu volcano has erupted frequently with intervals of 20-30 years and recent eruptions occurred in 1978 and 2000. We plan to make the fumarolic gas sampling at I-crater fumarolic area (Fig. 4, right) and the soil CO₂ flux survey at the surrounding area (Fig. 4 left). The I-crater fumarolic area locates at the foot of the dome formed by the 1978 eruption (Fig. 4, right) and was the location of the 2nd CCVG gas workshop in 1985 (Giggenbach and Matsuo, 1991). The highest temperature is still about 400°C but the fumarolic gases are >99.5% H₂O with very low CO₂, SO₂ and H₂S. SO₂ flux measurements will be very



difficult because of the low SO₂ content. At this location, Hernandez et al. (2001) observed a precursory soil CO₂ flux increase prior to the eruption in 2000.

We will walk about 30 min from a summit stop of a cable car to the fumarolic field.

Tentative Schedule

Starting Date: August 31, 2025

Day 1: Arrival at Sapporo & Ice Breaker party in Sapporo: Stay at Sapporo

Day 2: Scientific Meeting in Sapporo: Stay at Sapporo

Day 3: Scientific Meeting in Sapporo: Stay at Sapporo

Day 4: Field work at Kuttara volcano: Stay at Lake Toya

Day 5: Field work at Tarumae or Usu volcanoes: Stay at Lake Toya

Day 6: Field work at Tarumae or Usu volcanoes: Stay at Lake Toya

Day 7: Closing meeting and discussion, Fairwell Party: Stay at Lake Toya

Day 8: Morning: Transport to New Chitose Airport

* The organizing committee is looking into options for a pre-workshop field trip to Tokachi volcanoes in Hokkaido, it will be detailed in the second circular

* The schedule is tentative and could change to 7 days based on the hotel and transportation availability.

* Lake Toya is the caldera lake and is at the foot of Usu volcano. The area is very famous for the nice hot spring.



Important dates (tentative)

October 2024 – Second Circular

February 2025 – Pre-registration / Abstract submission open

April 2025 – Abstract submission close

May 2025 – Registration close

Fees

The fee for the workshop is estimated to be about 950-1150 USD per person. This will include activities (icebreaker & farewell parties, conference, field observations, and transportations), lunches during the field work, and the latter four nights hotel at Toya Lake (Including breakfast and dinner). We did not include three nights hotel and meals at Sapporo City, because the city has a variety of hotels from budget to luxury within walking distance from the conference hall. You can also find interesting restaurants inside the city. We will provide you the list of hotels within walking distance in the second circular, so that you can choose and make reservations directly through the hotels or through hotel reservation web pages.

The total fee may change with number of participants and due to following reasons. The prices of hotels and tourism in Japan are rapidly increasing year by year due to increasing inbound tourism in Japan, especially in Hokkaido area.

Local organizing committee

Toshiya MORI (Univ. Tokyo), Takeshi OHBA (Tokai Univ.), Takeshi HASHIMOTO (Hokkaido, Univ.), Ryo TANAKA (Hokkaido Univ.), Ryo TAKAHASHI (HRO), Muga YAGUCHI (MRI;



JMA), Ryunosuke KAZAHAYA (GSJ), Hiroshi SHINOHARA (GSJ), Masaaki MORITA (Univ. Tokyo), Hirochika SUMINO (Univ. Tokyo), Akihiko TERADA (Tokyo Inst. Tech.), Jun-ichi HIRABAYASHI (V.G.R.A), Urumu TSUNOGAI (Nagoya Univ.).

Contact: Ryunosuke KAZAHAYA (von.kazahaya@aist.go.jp),

Current board members of CCVG

Co-Leader: Tobias Fischer – Univ. of New Mexico, USA

Co-Leader: Silvana Hidalgo - Escuela Politécnica Nacional, Ecuador

Secretary: Artur Ionescu - Universitatea Babeş-Bolyai, Romania

References:

- Giggenbach W. F. and Matsuo S. (1991) Evaluation of results from Second and Third IAVCEI Field Workshops on Volcanic Gases, Mt Usu, Japan, and White Island, New Zealand, *App. Geochem.*, **6**, 125-141.
- Hernández, P. A., K. Notsu, J. M. Salazar, T. Mori, G. Natale, H. Okada, G. Virgili, Y. Shimoike, M. Sato, and N. M. Pérez (2001) Carbon dioxide degassing by advective flow from Usu volcano, Japan. *Science*, **292**, 83–86.

