

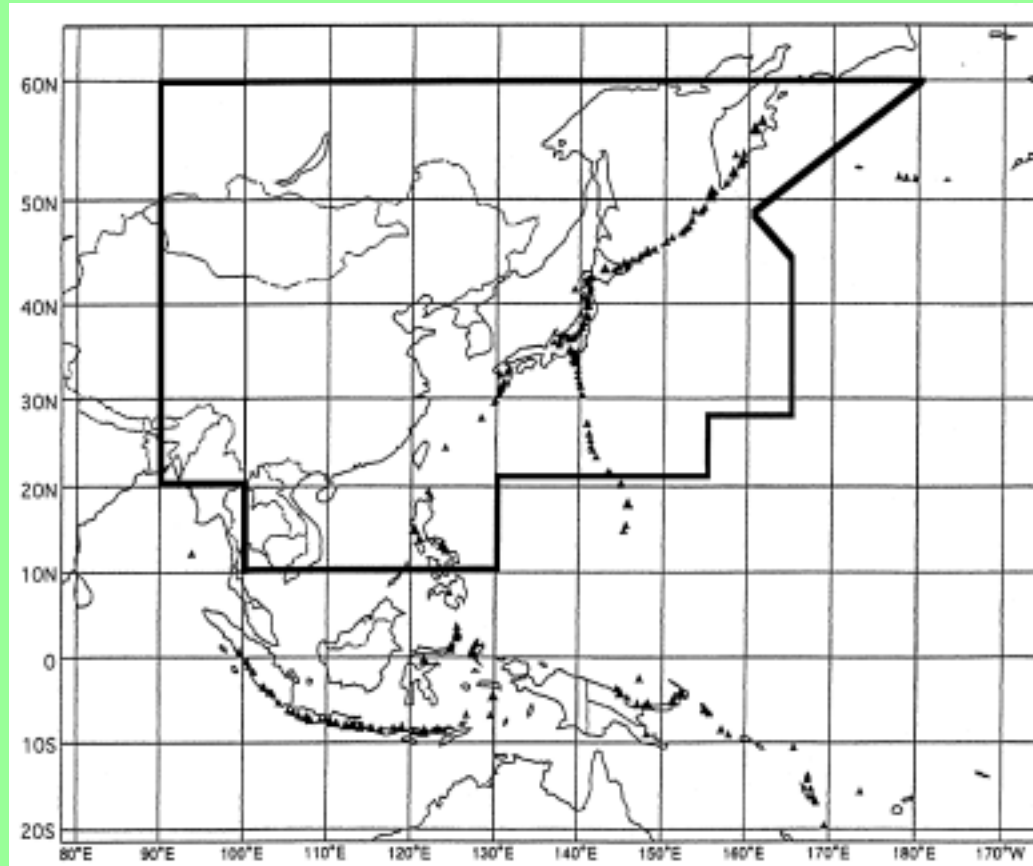
# **TOKYO VAAC OPERATION**

**Takeshi Koizumi**

**JMA(Japan Meteorological Agency)**

**Volcanological Division**

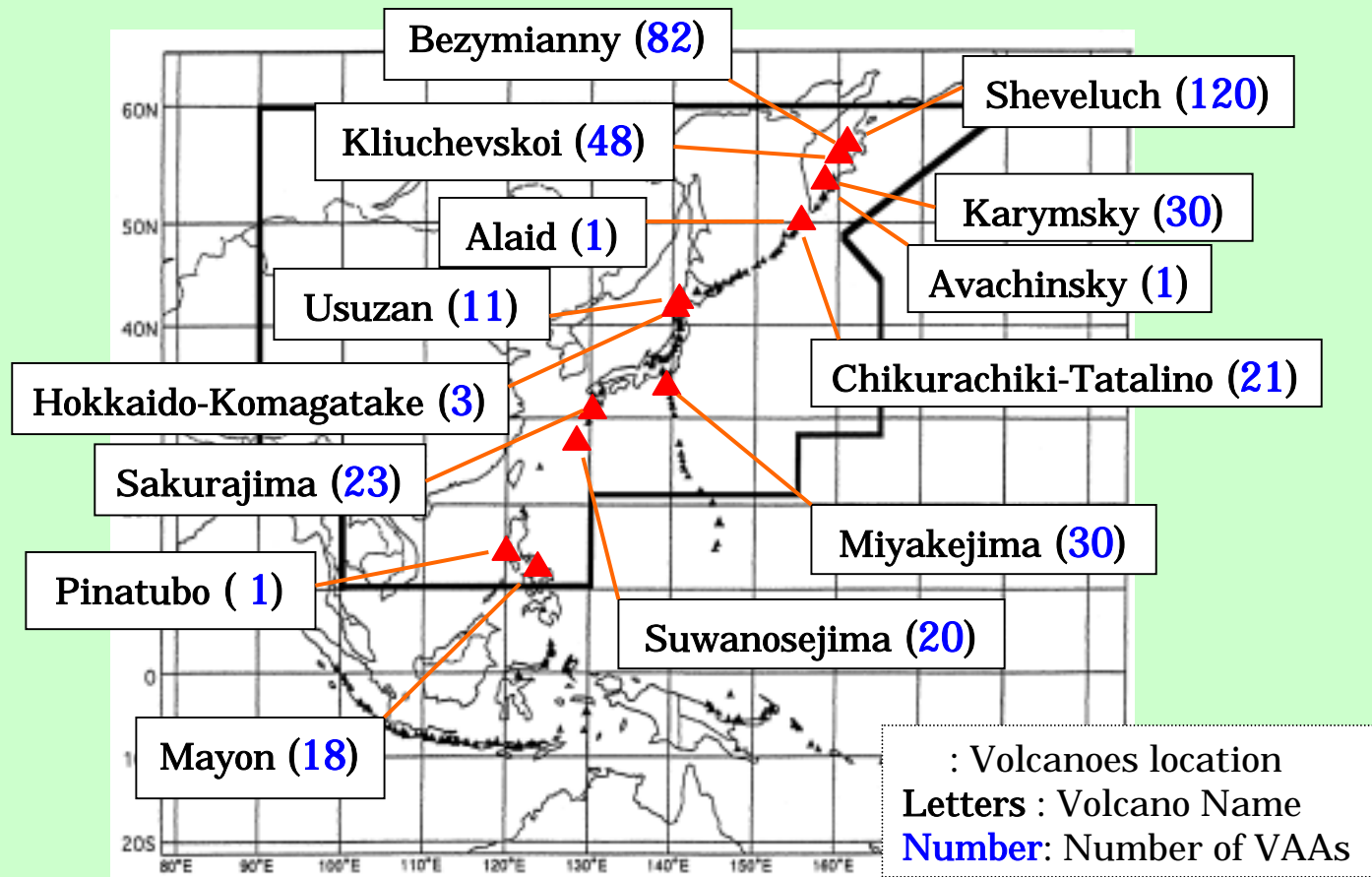
# Area of Responsibility of Tokyo VAAC



: Active volcanoes

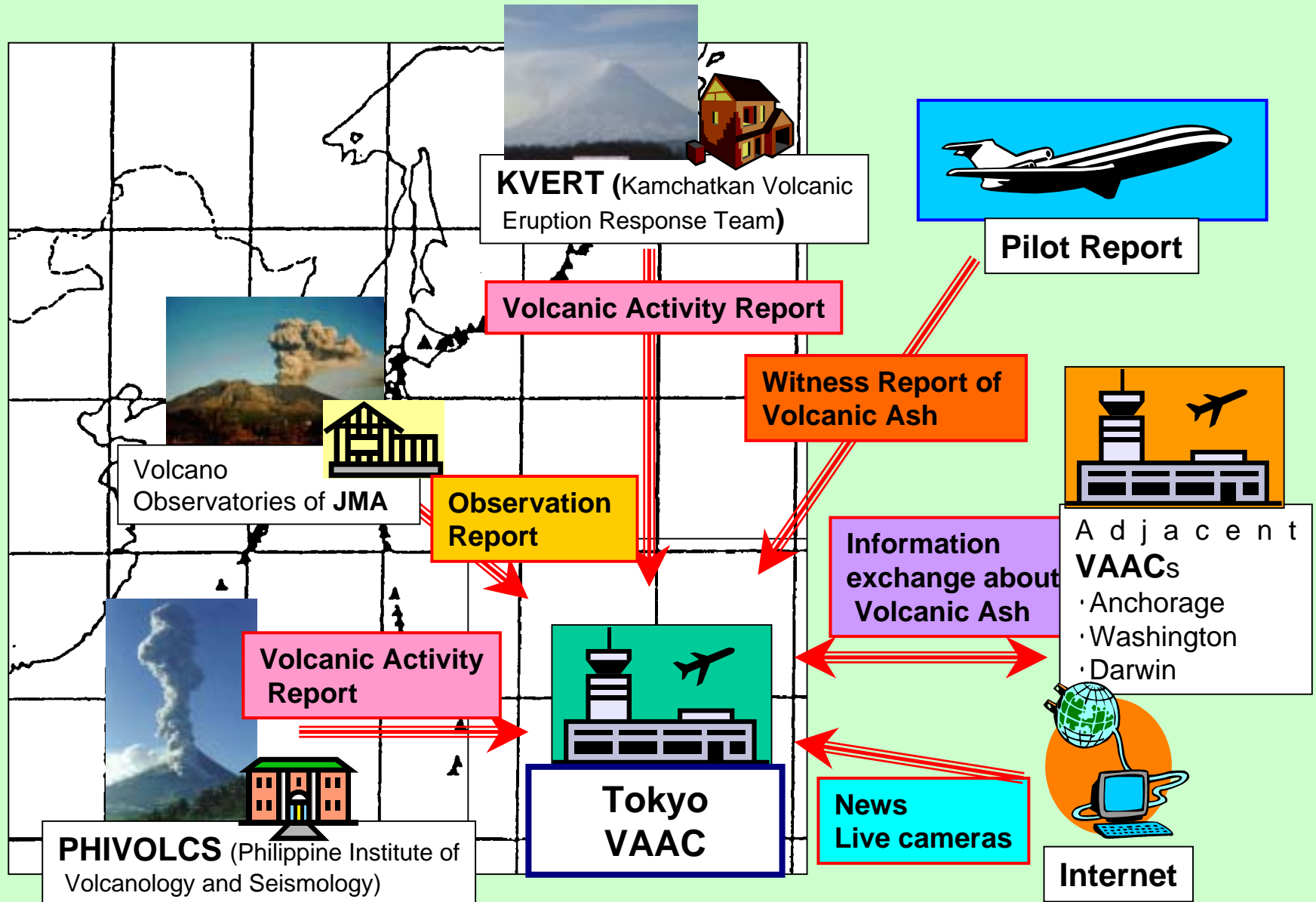
# Number of VAA issued by Tokyo VAAC

Mar., 1997 - Feb., 2004



**411 VAAs were issued in the period.**

# Acquisition route of Eruption Information in Tokyo VAAC



# Automatic Issuance System of VAA for Volcanic Eruption in Japan

(since Nov. 2003)

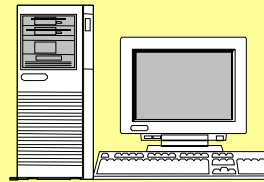


Volcano Observatory of JMA

Eruption  
report

**Eruption report :**  
(fixed format in Japanese)  
**Volcano name**  
**Eruption time**  
**Plume height**  
**Extending direction**

**Tokyo VAAC**



Based on the report,  
a VAA is issued  
**automatically** by the  
computer system.

Volcanic Ash  
Advisory



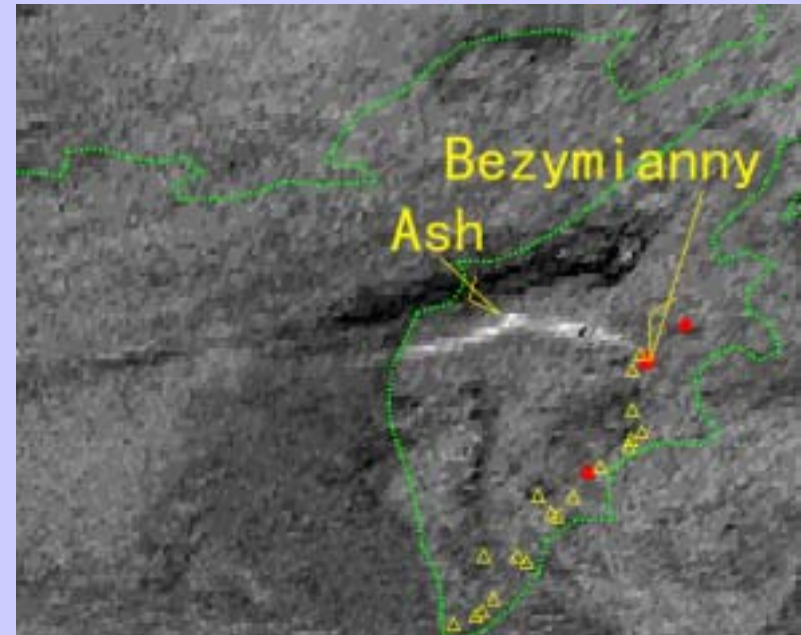
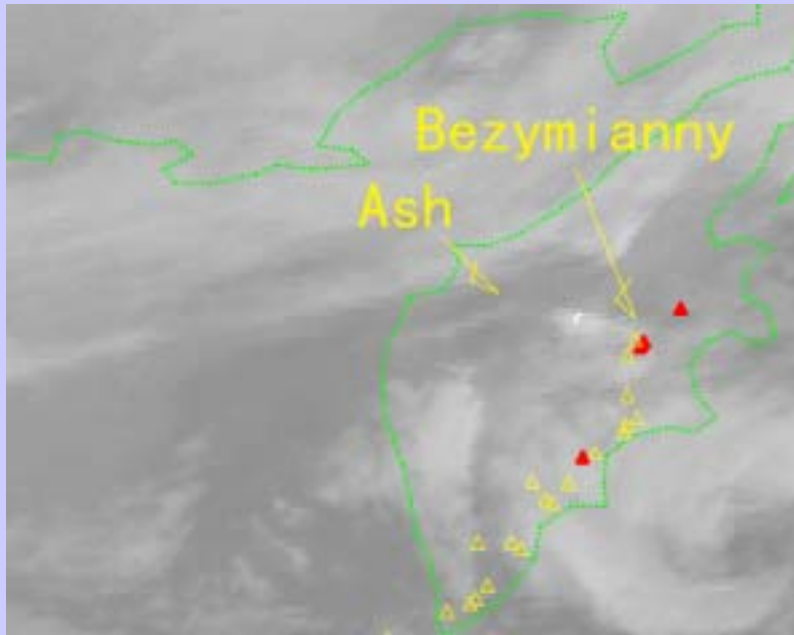
VAACs  
MWOs  
Airlines etc.

The VAA provides  
eruption information:  
**eruption time,**  
**plume height and dir.**  
and  
**wind information above**  
**the volcano.**

When the ash cloud of this  
eruption was detected on  
satellite imagery, second  
advisory will be issued  
immediately.

# Detection of Volcanic Ash Cloud on Satellite Imagery

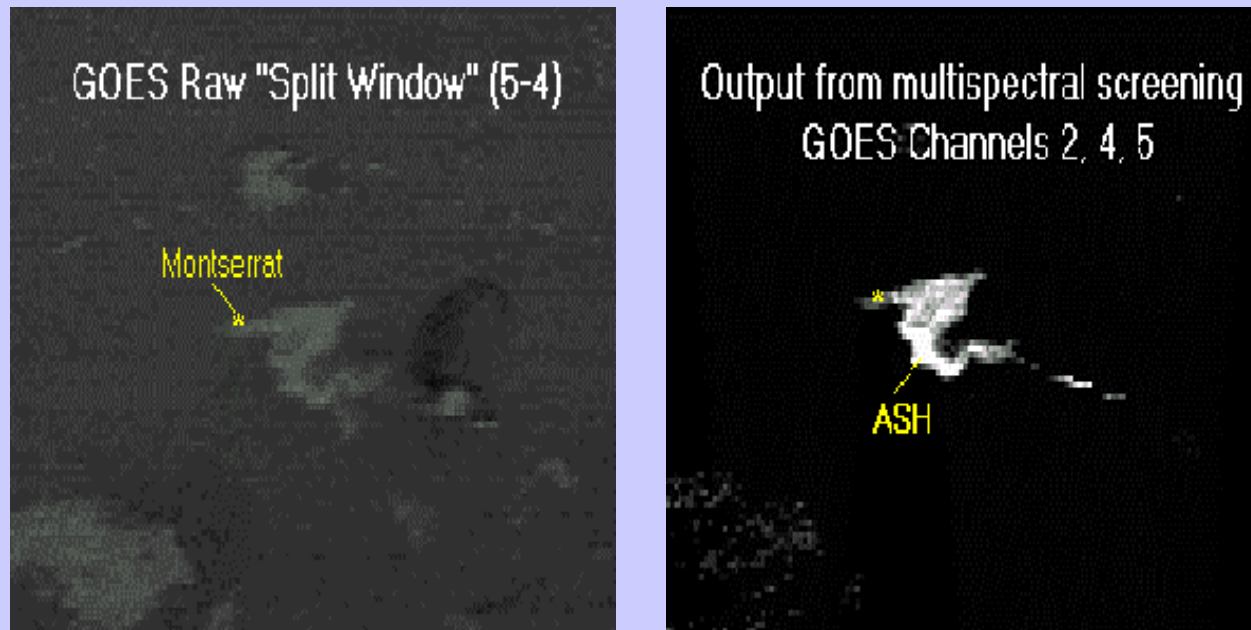
The infrared differential satellite images (Split Window) can detect volcanic ash clouds effectively. Tokyo VAAC has used GMS-5 or GOES-9 satellite image.



The original infrared image (left) and the infrared differential image (Split Window) (right) of the GMS-5 satellite. The volcanic ash cloud from Bezymianny volcano could be detected clearly on the latter.

# Improvement of Detection of Volcanic Ash Cloud using Short wavelength Infrared Image

Short wavelength infrared image from MT-SAT (to be launched this fall) is expected to enable the similar improvement as below.



Split Window (left) and the combined image of original and short wavelength infrared images (right) of the GOES satellite. The volcanic ash cloud of Soufriere hills volcano eruption on November 6, 1997 was detected clearer on the latter. (from Gary P. Ellrod (NOAA/NESDIS) et al., 1999).

# Forecast of Volcanic Ash Cloud Dispersion

## Forecast of volcanic ash cloud dispersion in Tokyo VAAC:

- Lagrangian model
- Wind data from JMA Numerical Weather Prediction (NWP) model

## The model was improved on November, 2003:

- More accurate for spatial and temporal
- Use of vertical wind
- More accurate for Japan to Kuril Is. area and low level

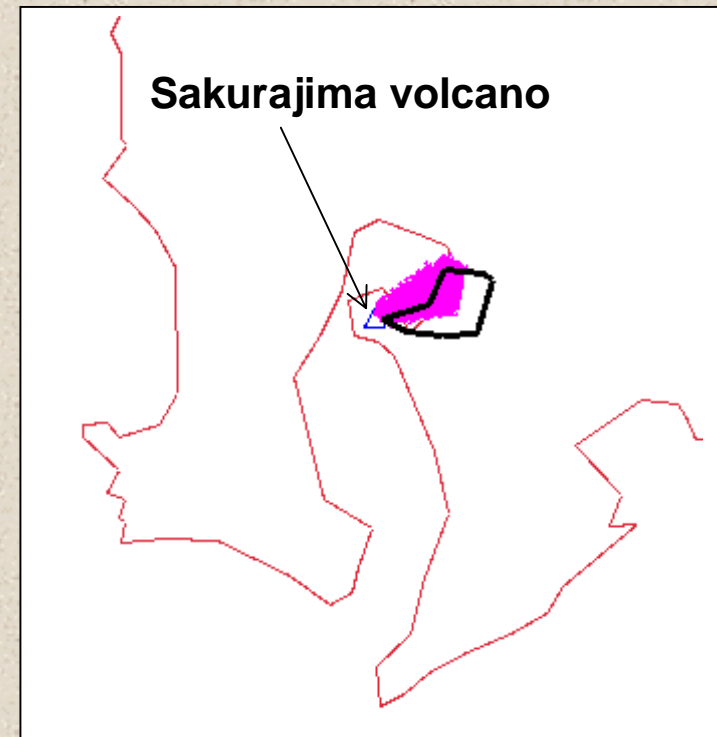
## Right figure:

Forecasted area => Pinkish colored area  
Detected area from GMS-5 => Black line

The volcanic plume at 35 minutes after Sakurajima volcano eruption on November 16, 2002.

The plume height from ground observation was 2,200 m ASL.

Map is roughly 125km by 125km.





# Coordination to Adjacent VAACs

## Information exchange via facsimile


For lowering the wall of language, the fixed format is used for:

- Exchange of current status of volcanic ash cloud
- Request or acceptance before the hand over of issuance of VAA

## Open to public using Homepage

The homepage of Tokyo VAAC has been open to public since Dec., 2003.

**URL:** [http://www.jma.go.jp/JMA\\_HP/jma/jma-eng/jma-center/vaac/index.html](http://www.jma.go.jp/JMA_HP/jma/jma-eng/jma-center/vaac/index.html)



**TOKYO VOLCANIC ASH ADVISORY CENTER**

**Volcanic Ash Advisory Center(VAAC)**

Volcanic ash clouds ejected by active volcanoes contain extremely hazardous materials which could cause serious engine troubles to airplanes. In order to avoid tragic airplane disasters caused by volcanic ash clouds, it is essential to provide information on them to civil aviation authorities, airline companies and related organizations. The International Civil Aviation Organization (ICAO), in cooperation with the World Meteorological Organization (WMO), therefore established a framework of the International Airways Volcano Watch in 1993, in which Volcanic Ash Advisory Centers (VAACs) monitor volcanic eruptions and provide information on locations and motions of volcanic ash clouds as well as their outlook for their responsible regions. Under this framework, nine VAACs at Anchorage, Buenos Aires, Darwin, London, Montreal, Tokyo,

Myosakejima explosion on 18