

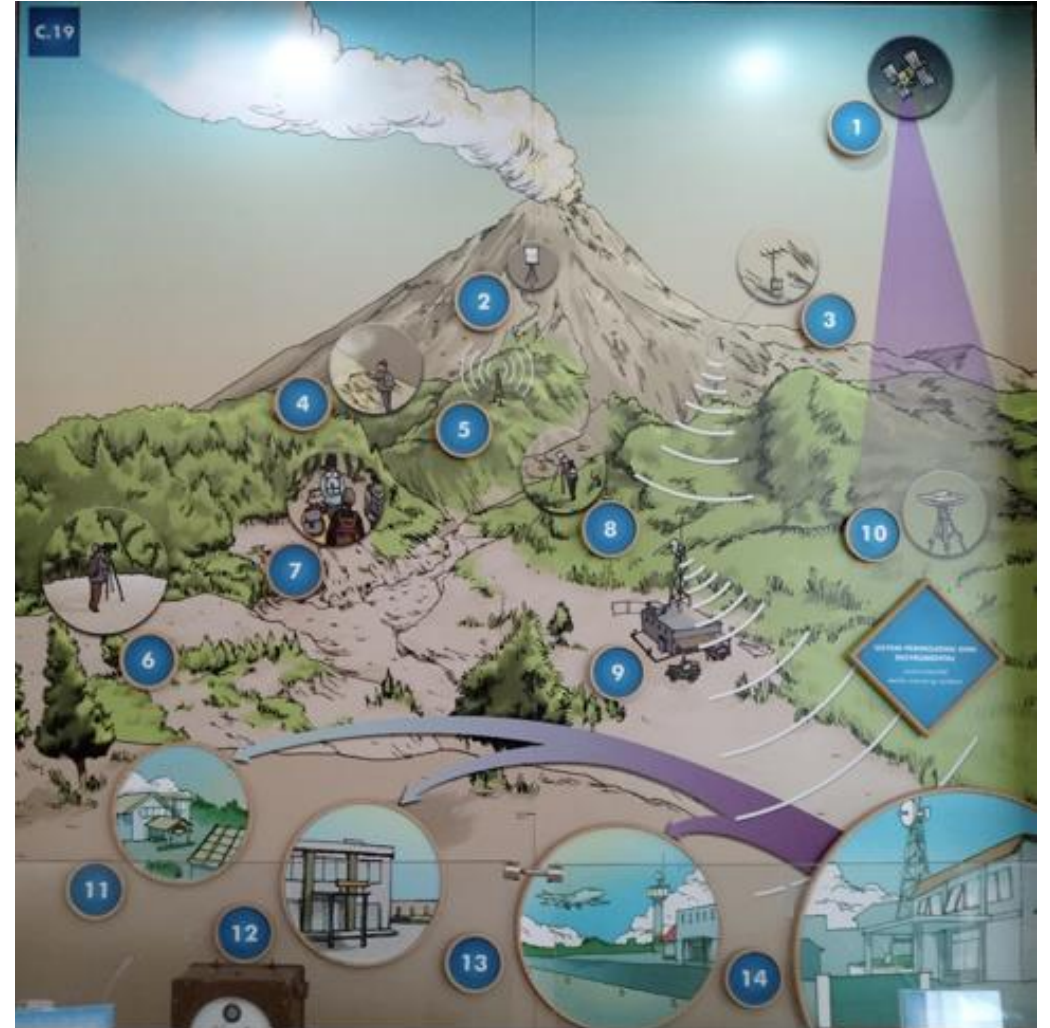
GVMID Data on Volcano Monitoring Infrastructure

*Fidel Costa,
Christina Widiwijayanti,
Nang Thin Zar Win,
Tania Espinosa-Ortega*

WOVOdat team



**NANYANG
TECHNOLOGICAL
UNIVERSITY**
SINGAPORE



Source: Merapi Museum, Yogyakarta

About GVMID > Documentation

- This page contains a full description of the database structure
- All data in GVMID archived and organized in a form of tables
- Detail table structure: the fields, indexes, links and constraints are described.

The screenshot shows the GVMID website's documentation page. At the top, there is a navigation bar with links for Home, About GVMID, Visualization, Contribute Data, and Feedbacks & Contact. Below this, a breadcrumb trail indicates 'Home > Documentation'. A dropdown menu is open, showing options for 'More About GVMID', 'Documentation', and 'User Manual'. The main heading is 'WOVodat2.0 documentation'. The page content includes a brief description of the database structure, a technical insight for those interested in database details, and a link to an offline version. A section titled 'Updates' notes that the latest updates are to be added later. The 'Tables by Field' section lists categories like Volcano, Deformation, Fields, Gas, and Hydrologic, each with a list of specific table names. On the right, a list of red bars represents various data fields, such as 'cb - Bibliographic', 'cc - Contact', 'cn - Common network', etc., with a plus sign indicating that clicking on the bar will show a description.

About GVMID > User Manual

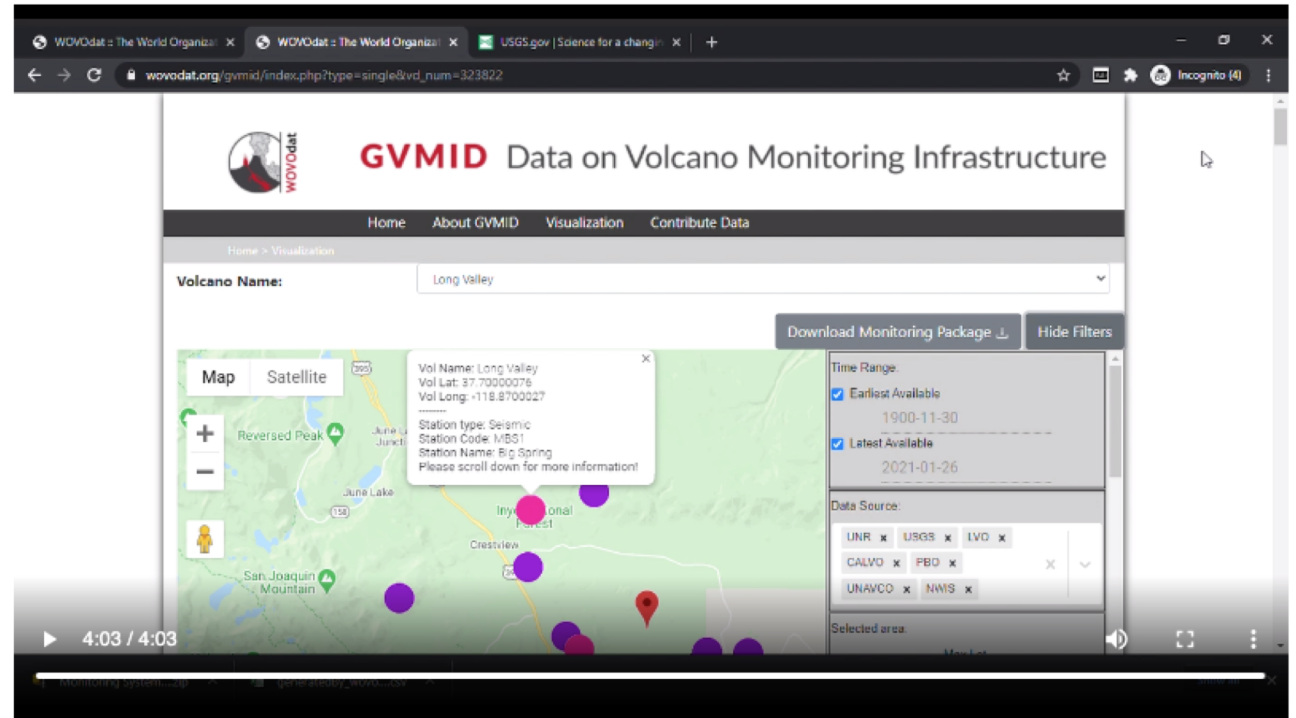
- GVMID User Manual
- Video tutorial:
 - ⇒ Data visualization
 - ⇒ Data search
 - ⇒ Data download



Tutorial - Visualization Video

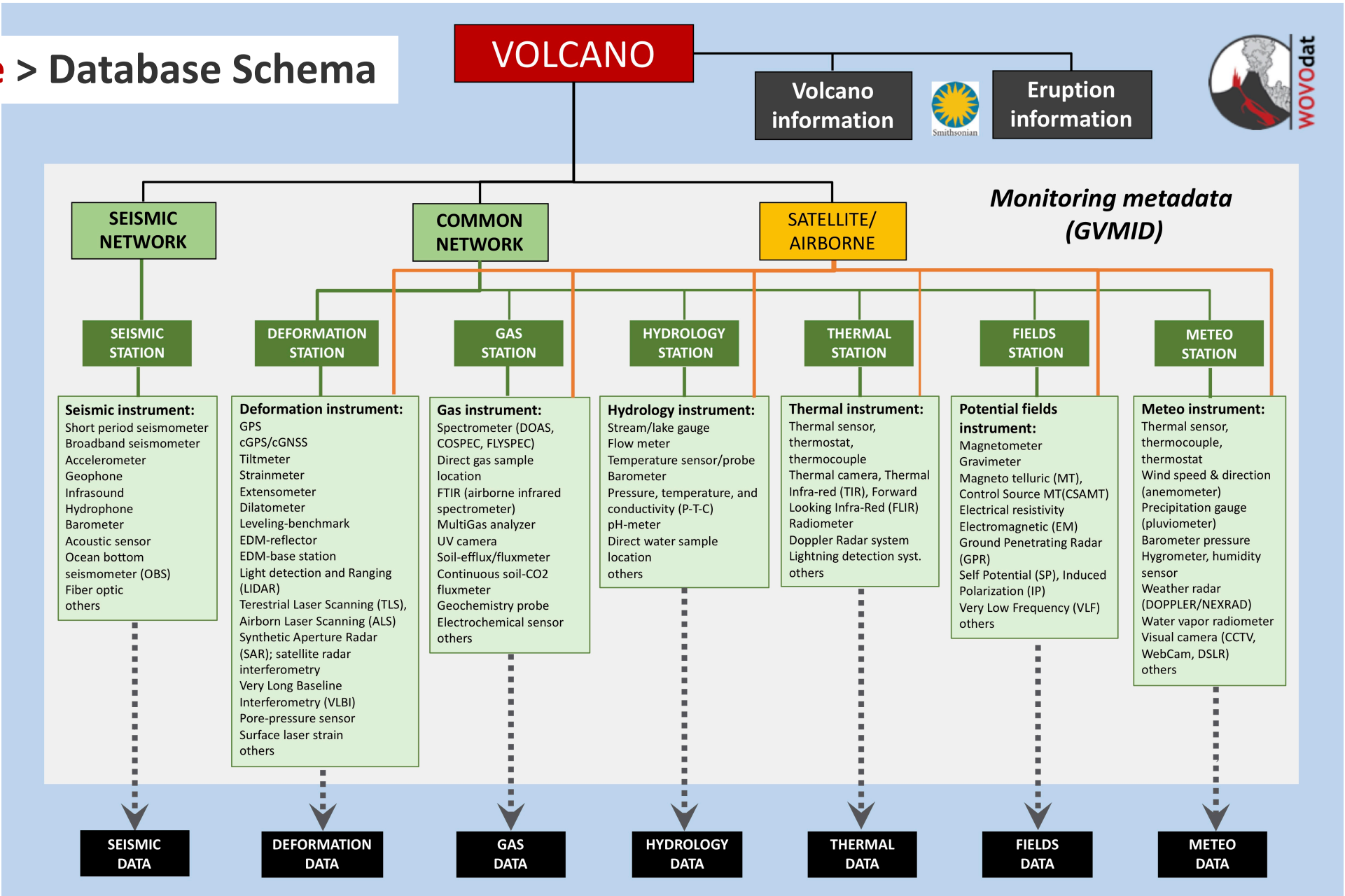
The Global Volcano Monitoring Infrastructure Database (GVMID) is a web-based repository and interface that allows volcano community to contribute, store and access volcano monitoring metadata. Detail documentation on using the GVMID can be found in this [User Manual](#).

Main feature of the GVMID user interface is visualisation tools. User can follow the video tutorial below, a step-by-step tutorial on how to display volcano monitoring worldwide and around a single volcano on top of Google map. We also provide filters at the right side panel, which is optional, allowing user to select and apply criteria of their choices.



Datasets & Database > Database Schema

- GVMID is being built:
 - as integral part of WOVOdat, in parallel with other volcanological DBs
 - can be linked to other database through *Volcano Number* (VNum, GVP' volcano unique identifier).



SIMPLIFIED GVMID SCHEMA

VOLCANO

Institution
Data owner/contributor

GROUND BASED
NETWORK

SATELLITE/
AIRBORNE

Seismic
station

Deformation
station

Gas
station

Hydrology
station

Thermal
station

Fields
station

Meteo
station

**Airborne/satellite
instrument:**

Deformation
Gas
Hydrology
Thermal
Fields
Meteo

Seismic instrument:

Short period seismometer
Broadband seismometer
Accelerometer
Geophone
Infrasound
Hydrophone
Barometer
Acoustic sensor
Ocean bottom
seismometer (OBS)
Fiber optic

Deformation instrument:

GPS
cGPS/cGNSS
Tiltmeter
Strainmeter
Extensometer
Dilatometer
Leveling-benchmark
EDM-reflector
EDM-base station
Light detection and Ranging
(LIDAR)
Terrestrial Laser Scanning (TLS),
Airborn Laser Scanning (ALS)
Synthetic Aperture Radar
(SAR); satellite radar
interferometry
Very Long Baseline
Interferometry (VLBI)
Pore-pressure sensor
Surface laser strain

Gas instrument:

Spectrometer (DOAS,
COSPEC, FLYSPEC)
Direct gas sample
location
FTIR (airborne infrared
spectrometer)
MultiGas analyzer
UV camera
Soil-efflux/fluxmeter
Continuous soil-CO2
fluxmeter
Geochemistry probe
Electrochemical sensor

Hydrology instrument:

Stream/lake gauge
Flow meter
Temperature sensor/probe
Barometer
Pressure, temperature, and
conductivity (P-T-C)
pH-meter
Direct water sample
location

Thermal instrument:

Thermal sensor,
thermostat,
thermocouple
Thermal camera, Thermal
Infra-red (TIR), Forward
Looking Infra-Red (FLIR)
Radiometer
Doppler Radar system
Lightning detection
system

**Potential fields
instrument:**

Magnetometer
Gravimeter
Magneto telluric (MT),
Control Source MT(CSAMT)
Electrical resistivity
Electromagnetic (EM)
Ground Penetrating Radar
(GPR)
Self Potential (SP), Induced
Polarization (IP)
Very Low Frequency (VLF)

Meteo instrument:

Thermal sensor,
thermocouple,
thermostat
Wind speed & direction
(anemometer)
Precipitation gauge
(pluviometer)
Barometer pressure
Hygrometer, humidity
sensor
Weather radar
(DOPPLER/NEXRAD)
Water vapor radiometer
Visual camera (CCTV,
WebCam, DSLR)

*All data will be georeferenced, time stamped,
and recorded with data source/owner*

Website Menu

Datasets & Database

Visualization & search

Contribute data

Datasets & Database > Table structure

This page contains a full description of the database structure, for each table:

- the fields/elements,
- indexes,
- links and
- constraints

The screenshot shows the website's navigation menu at the top with links for Home, About GVMID, Visualization, Contribute Data, and Feedbacks & Contact. Below the menu is a breadcrumb trail 'Home > Documentation' and a dropdown menu with options for 'More About GVMID', 'Documentation', and 'User Manual'. The main heading is 'WVOdat2.0 documentation'. The page content includes an introductory paragraph, a technical description of the database structure, and a link to an offline version. A section titled 'Updates' states that the latest updates are to be added later. The 'Tables by Field' section lists various categories and their corresponding tables, each with a red bar and a plus sign for expansion. The categories include Volcano, Deformation, Fields, Gas, Hydrologic, and Meteo.

Home About GVMID Visualization Contribute Data Feedbacks & Contact

Home > Documentation

More About GVMID

Documentation

User Manual

WVOdat2.0 documentation

This page contains a full description of the database structure.

This description brings a technical insight of the database. People who wish to know more about the database structure may thus use this document as a reference. For each table of the database, the fields, indexes, links and constraints are described.

An offline version of this documentation is available [here](#).

Updates

Latest updates to the database: *to be added later*

Tables by Field

Here is the list of tables used in the database, sorted by field:

Volcano

- [Volcano - vd](#)
- [Volcano information - vd_inf](#)

Deformation

- [Monitoring system](#)
- [Common network - cn](#)
- [Deformation station - ds](#)
- [Deformation instrument \(general\) - di_gen](#)
- [Tiltmeter/Strainmeter - di_tlt](#)

Fields

- [Monitoring system](#)
- [Common network - cn](#)
- [Fields station - fs](#)
- [Fields instrument - fi](#)

Gas

- [Monitoring system](#)
- [Common network - cn](#)
- [Gas station - gs](#)
- [Gas instrument - gi](#)

Hydrologic

- [Monitoring system](#)
- [Common network - cn](#)
- [Hydrologic station - hs](#)
- [Hydrologic instrument - hi](#)

Meteo

Click on red bars with field names to see Descriptions.

- [cb - Bibliographic](#) +
- [cc - Contact](#) +
- [cn - Common network](#) +
- [cr - Registry](#) +
- [cr_tmp - Temporary registry](#) +
- [cs - Satellite/Airplane](#) +
- [di_gen - General deformation instrument](#) +
- [di_tlt - Tilt/Strain instrument](#) +
- [ds - Deformation station](#) +
- [fi - Fields instrument](#) +
- [fs - Fields station](#) +
- [gi - Gas instrument](#) +
- [gs - Gas station](#) +
- [hi - Hydrologic instrument](#) +
- [hs - Hydrologic station](#) +
- [jj_volnet - Volcano-network junction](#) +
- [ms - Meteo station](#) +

GVMID > Visualization & search

<https://wovodat.org/gvmid/index.php?type=world>



GVMID Data on Volcano Monitoring Infrastructure

Home > Visualization

Monitoring Data Types: Seismic Deformation Gas Hydrologic Thermal Fields Meteorology

Number of Stations: 0 1~30 31~60 Single Volcano Map 100

Download Monitoring Package Hide Filters

Map Satellite

Harbin 哈尔滨市

Sapporo 札幌

North Korea

South Korea

Fukuoka 福岡

Vol Name: Oshima
Vol Lat: 34.72100067
Vol Long: 139.397995
Vol Elev: 764
Total Monitoring station: 191
[Click here to Explore Volcano Oshima](#)

Time Range:
 Earliest Available
1995-01-05
 Latest Available
2015-02-04

OR

Data Source:
Japan-JMA x | v

OR

Selected area:
Max Lat.
Min Long. Max Long.
Min Lat.

Currently there are 2 type of visualization level:

- Worldwide Volcano Map
- Single Volcano

Note:

- *Display all stations within 30km from volcano vent.*
- *No login required*
- *Filters are optional*

GVMID > Visualization & search > Worldwide volcano map

<https://wovodat.org/gvmid/index.php?type=world>

Monitoring Data Types: Seismic Deformation Gas Hydrologic Thermal Fields Meteorology

Number of Stations: 0 1~30 31~60 61~100 >100

Download Monitoring Package

Time Range:
 Earliest Available
2000-01-01
 Latest Available
2021-01-29

Data Source:
Japan-JMA x Japan-DPRI x

Selected area:
Max Lat.
Min Long. Max Long.
Min Lat.

Vol Name: Sakura-jima
Vol Lat: 31.58499908
Vol Long: 130.6569977
Vol Elev: 1117
Total Monitoring station: 61

Different color reflects total number of stations of each volcano within 30km from the vent.

When clicking at the circle icon, a pop up window of single volcano will appear, directed to single volcano visualization

Check-box to select monitoring system.
- By default all selected
- User can select one or more

Filter function to select by time, data source and area. This is all optional

Download package up to station level, based on filter selection. By default, the package contain all data.

GVMID > Download monitoring package > Worldwide volcano map

GVMID Data on Volcano Monitoring Infrastructure

Home About GVMID Visualization Contribute Data Feedbacks & Contact Survey Logout

Monitoring Data Types: Seismic Deformation Gas Hydrologic Thermal Fields Meteorology

Number of Stations: 0 1~30 31~60 61~100 >100

Download Monitoring Package Hide Filters

Time Range:
 Earliest Available 1900-01-01
 Latest Available 2021-02-17

OR

Data Source:
Select...

OR

Selected area:
Max Lat.
Min Long. Max Long.
Min Lat.

Monitoring WorldWide System package from wovodat.zip

- Deformation monitoring system.xlsx
- Fields monitoring system.xlsx
- Gas monitoring system.xlsx
- Hydrologic monitoring system.xlsx
- Meteo monitoring system.xlsx
- Seismic monitoring system.xlsx
- Thermal monitoring system.xlsx

Deformation monitoring system

Home Insert Page Layout Formulas Data Review View

Normal Page Break Preview Page Layout Custom Views Ruler Formula Bar Gridlines Headings Zoom 100%

A1 Station information

	A	B	C	D	E	F	G	H	I	J	K
1	Station information										
2											
3	Volcano Name	Volcano Number	Station Name	Station Code	Station Type	Station Location	Start Date	End Date	Datasource 1	Datasource 2	Datasource 3
82	Okataina	241050	RGHL	RGHL	Deformation	Lat: -38.251936	2008-12-02 14:0	Current	GNS		
83	Okataina	241050	RGKW	RGKW	Deformation	Lat: -38.052530	2008-11-27 12:0	Current	GNS		
84	Okataina	241050	GNS_RGCR_CG	GNS_RGCR_CG	Deformation	Lat: -38.104693	2004-12-01 08:0	Current	GNS		
85	Okataina	241050	GNS_RGHD_CG	GNS_RGHD_CG	Deformation	Lat: -38.093658	2004-12-01 08:0	Current	GNS		
86	Okataina	241050	GNS_RGKA_CG	GNS_RGKA_CG	Deformation	Lat: -38.020071	2004-12-01 08:0	Current	GNS		
87	Okataina	241050	GNS_RGKW_CG	GNS_RGKW_CG	Deformation	Lat: -38.052530	2004-12-01 08:0	Current	GNS		
88	Okataina	241050	GNS_RGLI_CG	GNS_RGLI_CG	Deformation	Lat: -38.003279	2004-12-01 08:0	Current	GNS		
89	Okataina	241050	GNS_RGMK_CG	GNS_RGMK_CG	Deformation	Lat: -38.138341	2004-07-20 08:0	Current	GNS		
90	Okataina	241050	GNS_RGRE_CG	GNS_RGRE_CG	Deformation	Lat: -38.0573	2004-07-20 08:0	Current	GNS		
91	Okataina	241050	GNS_RGUT_CG	GNS_RGUT_CG	Deformation	Lat: -38.176648	2004-12-01 08:0	Current	GNS		
92	Okataina	241050	GNS_RGTA_CG	GNS_RGTA_CG	Deformation	Lat: -38.233772	2004-12-01 08:0	Current	GNS		
93	Okataina	241050	GNS_RGHL_CG	GNS_RGHL_CG	Deformation	Lat: -38.251936	2004-12-01 08:0	Current	GNS		
94	Okataina	241050	GNS_RGON_CG	GNS_RGON_CG	Deformation	Lat: -38.256592	2008-10-08 00:0	Current	GNS		
95	Okataina	241050	GNS_RGRR_CG	GNS_RGRR_CG	Deformation	Lat: -38.338892	2004-02-16 00:0	Current	GNS		
96	Reporoa	241060	GNS_RGUT_CG	GNS_RGUT_CG	Deformation	Lat: -38.176648	2004-12-01 08:0	Current	GNS		
97	Reporoa	241060	GNS_RGTA_CG	GNS_RGTA_CG	Deformation	Lat: -38.233772	2004-12-01 08:0	Current	GNS		
98	Reporoa	241060	GNS_ARTA_CG	GNS_ARTA_CG	Deformation	Lat: -38.617581	2008-10-08 00:0	Current	GNS		
99	Reporoa	241060	GNS_RGAR_CG	GNS_RGAR_CG	Deformation	Lat: -38.562045	2004-12-01 08:0	Current	GNS		
100	Reporoa	241060	GNS_RGHL_CG	GNS_RGHL_CG	Deformation	Lat: -38.251936	2004-12-01 08:0	Current	GNS		
101	Reporoa	241060	GNS_RGHR_CG	GNS_RGHR_CG	Deformation	Lat: -38.385799	2004-03-19 03:0	Current	GNS		
102	Reporoa	241060	GNS_RGON_CG	GNS_RGON_CG	Deformation	Lat: -38.256592	2008-10-08 00:0	Current	GNS		
103	Reporoa	241060	GNS_RGRR_CG	GNS_RGRR_CG	Deformation	Lat: -38.338892	2004-02-16 00:0	Current	GNS		

Download monitoring package for "worldwide volcano"

- Zip file with Excel spreadsheet files representing different monitoring techniques
- Each monitoring technique will have list of stations

GVMID > Visualization & search > Single volcano map

Different icons reflect different station and instrument

Link to data contributor

https://wovodat.org/gvmid/index.php?type=single&vd_num=284050

Volcano Name:

Download Monitoring Package Hide Filters

Map Satellite

Time Range:
 Earliest Available
1951-05-01
 Latest Available
2021-01-29

Data Source:
JMA x NIED x GSI x

Selected area:
Max Lat.
Min Long. Max Long.
Min Lat.

Type & Installation:
 In situ ground-based Permanent
 Remote ground-based Non-permanent
 Airborne/Satellite

Selected Methods:
 Seismic
Seismic Stations: 11
 active 11 inactive 0
Seismic Instruments: 9
Short period seismic: 7
 active 7 inactive 0 All
Infrasound: 1
 active 1 inactive 0 All
Broadband: 1
 active 1 inactive 0 All
 Deformation
Deformation Stations: 13
 active 13 inactive 0

Go to datasource

Download package up to instrument level, based on filter selection. By default, the package contain all data for selected volcano.

Filter panel to select:

- Time range
- Data source
- Selected area
- Type of installation
- Installation status
- Monitoring method
- instrument type

GVMID > Visualization & search > Single volcano map

GVMID Data on Volcano Monitoring Infrastructure

Home About GVMID Visualization Contribute Data Feedbacks & Contact Logout

Home > Visualization

All volcano lists from the database are listed here. It does not mean that all volcanos have a monitoring system. If you get null results, WOVOdat needs the metadata for that specific volcano.

Volcano Name: St. Helens

Go to GVP Go to WOVOdat Download Monitoring Package Hide Filters

Map Satellite

Vol Name: St. Helens
Vol Lat: 46.19800076
Vol Long: -122.1880003

Station type: Deformation
Station Code: P690
Station Name: South Ridge A
Please scroll down for more information!

Seismic
Seismic Stations: 103
active 98 inactive 5
Seismic Instruments: 18
Short period seismo: 16
active 16 inactive 0 All
Accelerometer: 2
active 2 inactive 0 All

Deformation
Deformation Stations: 88
active 43 inactive 45
Deformation Instruments: 139
cGPS/cGNSS Receiver: 56
active 25 inactive 31 All
cGPS/cGNSS Antenna: 9
active 0 inactive 9 All
EDM base: 2
active 0 inactive 2 All
Angle: 30
active 0 inactive 30 All
EDM refl.: 19
active 0 inactive 19 All
Tilt: 19

Go to datasource CVO USGS NSF PNSN PBO UNAVCO NWIS

Station Information

Volcano	St. Helens
Volcano Location	Lat: 46.19800076 - Lon: -122.1880003
Volcano Elevation	2549
Station Type	Deformation
Station Name	South Ridge A
Station Code	P690
Station Location	Lat: 46.1801 - Lon: -122.1898
Station Elevation	2091
Station Installation Type	Permanent
Station Start Date	2005-01-25 12:00:25
Station End Date	Current
Datasource 1	USGS
Datasource 2	CVO
Datasource 3	PBO

Example of single volcano visualization tool for St. Helens displaying popup box of deformation station P690, where cGPS/cGNSS and tiltmeter instruments were installed.

General Instruments:

Name	Type	Type Abbrev.	Installation Place	Start Date	End Date	Description
P690_CGPSD	cGPS/cGNSS Receiver	cGPS/cGNSS Receiver	In situ ground-based	2005-01-25 12:00:00	Current	

Tilt Instruments:

Name	Type	Type Abbrev.	Installation Place	Start Date	End Date	Description
P690_BTS	Tiltmeter	Tilt	In situ ground-based	2005-02-01 12:00:00	Current	

Export to CSV

To download data:

- the detail information on selected station and instrument by clicking blue button "Export to CSV"
- the entire monitoring infrastructure metadata of the volcano by clicking at "Download Monitoring Package"

GVMID > Download monitoring package > Single volcano map

Volcano Name: Long Valley

Go to GVP Go to WOVodat

Download Monitoring Package

Map Satellite

Vol Name: Long Valley
Vol Lat: 37.7000076
Vol Long: -118.8700027

Station type: Seismic
Station Code: CBLG
Station Name: Bald Mtn Lookout
Please scroll down for more information!

Time Range:
Earliest Available: 1900-11-30
Latest Available: 2021-02-17

Data Source:
UNR x USGS x LVO x
CALVO x PBO x
UNAVCO x NWIS x

Selected area:

Type & Installation:

Selected Methods:
Seismic
Seismic Stations: 62
active 39 inactive 23
Seismic Instruments: 116
Short period seismo: 88
active 27 inactive 61 All
Dilatometer: 9

Go to datasource UNR USGS LVO CALVO PBO UNAVCO NWIS

Seismic monitoring system

Home Insert Page Layout Formulas Data Review View

Calibri (Body) 12

General

Conditional Formatting Format as Table Cell Styles

H11

	A	B	C	D	E	F	G	H	I
1	Volcano information								
2									
3	Volcano Name	Long Valley							
4	Volcano Location	Lat: 37.7000076 - Lon: -118.8700027							
5	Volcano Elevation	3390							
6									
7	Station information								
8									
9	Name	Code	Location	Start Date	End Date	Datasource 1	Datasource 2	Datasource 3	Installation Type
10	Benton	BEN	Lat: 37.7155 - Lon: -118.1983-10-20 00:00:01	Current		UNR			Permanent
11	HILTON_CREEK	HTC	Lat: 37.5298 - Lon: -118.1984-07-19 00:00:00	Current		UNR			Permanent
12	McGee_Canyon	MGN	Lat: 37.8133 - Lon: -118.1980-11-21 00:00:00	Current		UNR			Permanent
13	Mono_Craters	MCC	Lat: 37.9195 - Lon: -119.2002-09-18 00:00:00	Current		UNR			Permanent
14	Owens_River	ORC	Lat: 37.6353 - Lon: -118.1979-11-01 00:00:00	Current		UNR			Permanent
15	Rock_Creek_Canyon	RCC	Lat: 37.4877 - Lon: -118.1983-10-27 00:00:00	Current		UNR			Permanent
16	Silver_Lake	SLK	Lat: 37.834 - Lon: -119.1983-07-28 00:00:00	Current		UNR			Permanent
17	Old_Mammoth_Mine	OMM	Lat: 37.6124 - Lon: -118.2000-07-13 00:00:00	Current		UNR			Permanent
18	Bald Mtn Lookout	CBLG	Lat: 37.7715 - Lon: -118.1985-10-16 20:00:00	1989-11-09 23:59:00		USGS			Permanent
19	Harding Camp	CHMG	Lat: 37.624832 - Lon: -1.1984-01-01 00:00:00	1985-10-17 01:01:00		USGS			Permanent
20	Casa Diablo	DBOG	Lat: 37.652832 - Lon: -1.1984-04-05 00:00:00	1989-11-09 22:25:00		USGS			Permanent
21	Experiment Station	EXSG	Lat: 37.613667 - Lon: -1.1984-04-05 00:00:00	1989-11-09 22:25:00		USGS			Permanent
22	Laurel Creek	LRCG	Lat: 37.585667 - Lon: -1.1984-01-01 01:00:00	1989-11-09 22:20:00		USGS			Permanent
23	Big Spring	MBS1	Lat: 37.761024 - Lon: -1.2001-11-02 23:00:00	Current		USGS			Permanent
24	Boneyard	MBY	Lat: 37.640835 - Lon: -1.1984-01-01 00:00:00	1984-12-12 17:00:01		USGS			Permanent
25	Casa Benchmark	MCB	Lat: 37.644394 - Lon: -1.2002-09-20 00:00:00	Current		USGS			Permanent
26	Convict Lake (old)	MCL	Lat: 37.590321 - Lon: -1.1984-01-01 00:00:00	1995-08-04 20:30:00		USGS			Permanent
27	Convict Moraine (old)	MCM	Lat: 37.609234 - Lon: -1.1984-01-01 00:00:00	Current		USGS			Permanent
28	Central	MCN	Lat: 37.633835 - Lon: -1.1984-01-01 00:00:00	1984-09-22 16:45:00		USGS			Permanent
29	Casbaugh Ranch	MCR	Lat: 37.677666 - Lon: -1.1984-01-01 00:00:00	1989-08-03 18:30:00		USGS			Permanent
30	Casa Diablo Hot Spr	MCS	Lat: 37.654873 - Lon: -1.1984-01-01 00:00:00	Current		USGS			Permanent
31	Convict Lake (new)	MCV	Lat: 37.590027 - Lon: -1.1995-08-04 21:12:00	Current		USGS			Permanent
32	Casa West	MCW	Lat: 37.644165 - Lon: -1.1984-01-01 00:00:00	1984-12-12 21:00:01		USGS			Permanent
33	Mammoth Mtn McCoy	MCY	Lat: 37.643108 - Lon: -1.2010-09-22 22:30:00	Current		USGS			Permanent
34	Deadman Creek (old)	MDC	Lat: 37.70969 - Lon: -1.1984-01-01 00:00:00	Current		USGS			Permanent
35	Mammoth Hole surface	MDH	Lat: 37.679752 - Lon: -1.2010-09-21 00:00:00	Current		USGS			Permanent
36	Mammoth Deep Hole	MDH1	Lat: 37.679752 - Lon: -1.2003-10-23 23:00:00	Current		USGS			Permanent
37	Devils Postpile	MDP	Lat: 37.632462 - Lon: -1.1984-10-20 00:00:00	2008-09-18 16:47:00		USGS			Permanent
38	Devils Postpile	MDP1	Lat: 37.632462 - Lon: -1.2000-10-14 16:34:00	Current		USGS			Permanent

Stations Instruments Components +

Ready

Monitoring System package from wovodat.zip

- Deformation monitoring system.xlsx
- Fields monitoring system.xlsx
- Gas monitoring system.xlsx
- Hydrologic monitoring system.xlsx
- Meteo monitoring system.xlsx
- Seismic monitoring system.xlsx
- Thermal monitoring system.xlsx

Download monitoring package for "single volcano"

- Zip file with Excel spreadsheet files representing different monitoring techniques
- Each monitoring technique will have list of stations & instruments

GVMID > Contribute Data

https://wovodat.org/populate/index_gvmid.php



GVMID Data on Volcano Monitoring Infrastructure

Home About GVMID Visualization **Contribute Data** Feedbacks & Contact

Home > LOGIN

Log In

(Same as WOVODat log-in account)

Username:

Password:

[Forgot Your Password?](#)

New User?

[Register Here](#)

- 1) Select menu “**Contribute Data**”
- 2) **Login** with your **user account**

Note:

*Register first if you haven't create an account;
WOVODat account works here*

*Please check the email confirmation from
wovodat@wovodat.org, it might be stored to
your spam mailbox*

Website Menu

Datasets & Database

Visualization & search

Contribute data



GVMID Data on Volcano Monitoring Infrastructure

[Home](#) [About GVMID](#) [Visualization](#) [Contribute Data](#) [Feedbacks & Contact](#) [Logout](#)

[Home](#) > [Contribute Data](#)

Input Data

If you wish to upload the monitoring infrastructure datasets to GVMID, please organize your data following the Excel template format [here](#), then upload your Excel file using upload form below:

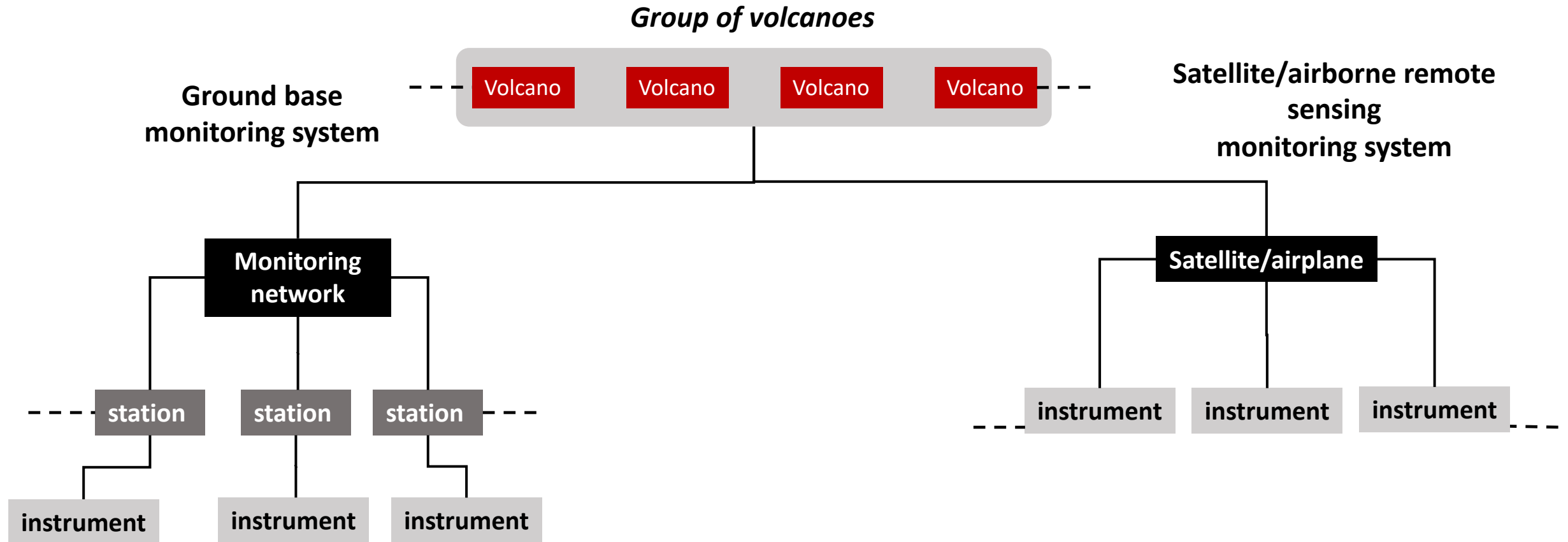
Please write your name, email and observatory/institution name before submitting the file:

No file chosen

As anticipation of various data formats coming from different observatories, we provide interactive tools for users to submit data following an **Excel spreadsheet template format**

But you can as well upload the data with your own format, we will contact you when more information needed.

Datasets & Database > MySQL relational database management system



Data in GVMID is organized in a MySQL hierarchical relational database management system where all available infrastructure/metadata in a specific volcano will be linked through “volcano” as the parent table.

Datasets & Database > MySQL table schema & structure

cn - Common network
Common network code
Common network name
Common network type
Volcano-1 ID
Volcano-2 ID
...
Start time
End time
Time difference to UTC
Description
Owner-1 ID
Owner-2 ID
Load date
Publish date
Data loader ID
Reference
...

ds - Deformation station
Station code
Station name
Instrument list
Network ID
Station latitude
Station Longitude
Station elevation
Installation type
...
Start time
End time
Time difference to UTC
Description
Owner-1 ID
Owner-2 ID
Load date
Publish date
Data loader ID
Reference
...

di_gen - General deformation instrument
instrument code
instrument name
Instrument type
Instrument description
Station ID
Installation location/type
...
Start time
End time
Time difference to UTC
Owner-1 ID
Owner-2 ID
Load date
Publish date
Data loader ID
Reference
...

csi_gen - satellite/airborne instrument
instrument code
Instrument name
Instrument type
Instrument description
Spatial resolution
Swath width
Pixel size
Cycle/repeatability
Instrument operator
Satellite/airplane ID
Volcano-1 ID
Volcano-2 ID
...
Start time
End time
Time difference to UTC
Owner-1 ID
Owner-2 ID
Load date
Publish date
Data loader ID
Reference
...

cs - Satellite/Airplane
Satellite/airplane code
Satellite/airplane name
Orbital type
Orbital height
Operator
Mission
Instrument list
COSPAR ID
SATCAT no
...
Start time
End time
Temporal resolution
Description
Owner-1 ID
Owner-2 ID
Load date
Publish date
Data loader ID
Reference
...

All data will be georeferenced, time stamped, and recorded with data source/owner

Datasets & Database > Monitoring methods & instrument types

STATION

Seismic:

1. Short period seismometer
2. Broadband seismometer
3. Accelerometer
4. Geophone
5. Infrasound
6. Hydrophone
7. Barometer
8. Acoustic sensor
9. Ocean bottom seismometer (OBS)
10. Fiber optic

Gas:

1. Spectrometer (DOAS, COSPEC, FLYSPEC)
2. Direct gas sample location
3. FTIR (airborne infrared spectrometer)
4. MultiGas analyzer
5. UV camera
6. Soil-efflux/fluxmeter
7. Continuous soil-CO2 fluxmeter
8. Geochemistry probe
9. Electrochemical sensor

Meteorology:

1. Thermal sensor, thermocouple, thermostat
2. Wind speed & direction (anemometer)
3. Precipitation gauge (pluviometer)
4. Barometer pressure
5. Hygrometer, humidity sensor
6. Weather radar (DOPPLER/NEXRAD)
7. Water vapor radiometer

Hydrology:

1. Stream/lake gauge
2. Flow meter
3. Temperature sensor/probe
4. Barometer
5. Pressure, temperature, and conductivity (P-T-C)
6. pH-meter
7. Direct water sample location

Deformation:

1. GPS
2. cGPS/cGNSS
3. Tiltmeter
4. Strainmeter
5. Extensometer
6. Dilatometer
7. Leveling-benchmark
8. EDM-reflector
9. EDM-base station
10. Light detection and Ranging (LIDAR)
11. Terrestrial Laser Scanning (TLS), Airborn Laser Scanning (ALS)
12. Synthetic Aperture Radar (SAR); satellite radar interferometry
13. Very Long Baseline Interferometry (VLBI)
14. Pore-pressure sensor
15. Surface laser strain

Potential fields:

1. Magnetometer
2. Gravimeter
3. Magneto telluric (MT), Control Source MT(CSAMT)
4. Electrical resistivity
5. Electromagnetic (EM)
6. Ground Penetrating Radar (GPR)
7. Self Potential (SP), Induced Polarization (IP)
8. Very Low Frequency (VLF)

Thermal:

1. Thermal sensor, thermostat, thermocouple
2. Thermal camera, Thermal Infra-red (TIR), Forward Looking Infra-Red (FLIR)
3. Radiometer
4. Doppler Radar system
5. Lightning detection system
6. Visual camera (CCTV, WebCam, DSLR, High resolution camera)

Datasets & Database > Operational & installation type

OPERATIONAL: Active or inactive

➤ *This will be recorded & reflected in the start-time and end-time of station's and instrument's operational time*

INSTALLATION TYPE

▪ **Station:**

- permanent
- non-permanent

▪ **Instrument:**

- **In situ ground-based (station location)**

surface, subsurface, shallow borehole, deep borehole, cave/tunnel, submerged/submarine/under water

⇒ permanent (continuous, periodical, benchmark points)

⇒ non-permanent (temporary; rapid deployment/experimental/mapping)

- **Remote ground-based (station location)**

terrestrial

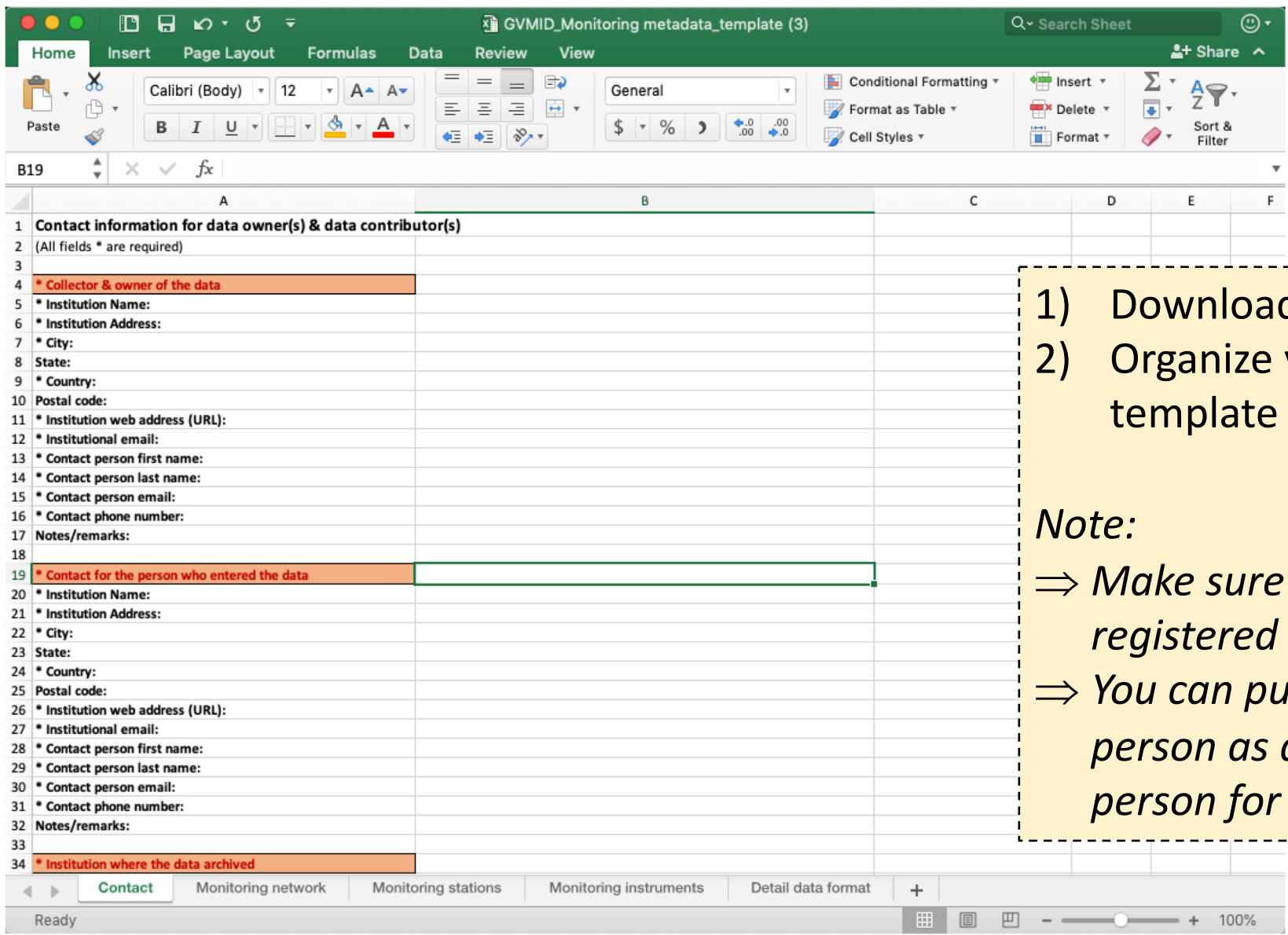
e.g. Light detection and Ranging (LIDAR), Terrestrial Laser Scanning (TLS), ground-based Synthetic Aperture Radar (SAR), Scan DOAS

- **Airborne/satellite (no location. Instead it will use volcano location)**

airborne (UAV/drone, airplane, satellite)

e.g. Airborn Laser Scanning (ALS); satellite radar interferometry; airborne Flyspec

GVMID > Contibute Data > Submit Data > Spreadsheet template



1) Download spreadsheet template
2) Organize your data following the template

Note:
⇒ Make sure your institution is already registered as data contributor/owner
⇒ You can put your name or assigned other person as data uploader and contact person for the data

GVMID > Contibute Data > Submit Data > Spreadsheet template

GVMID_Monitoring metadata_template (3)

Home Insert Page Layout Formulas Data Review View

Calibri (Body) 12

Wrap Text Merge & Center

General

Conditional Formatting Format as Table Cell Styles

Insert Delete Format

Sort & Filter

C24

	A	B	C	D	E	F	G
1	Network(s)						
2	Detail description & information about the monitoring network						
3	(All fields * are required)						
4							
5	*Network name (max 255 characters)	*Network code (max 30 characters)	*Volcano(es) covered by the network (comma separated)	*Network type (seismic, deformation, hydrology, thermal, gas, potential fields, meteorology, etc.)	*Start operational time of the the network (YYYY-MM-DD HH:MM:SS in UTC)	*End operational time of the the network (YYYY-MM-DD HH:MM:SS in UTC)	Timing used, with refer to UTC
6	PVMBG Jawa Tengah seismic network B	Seisnet_PVMBG_Jateng_B	Merapi, Merbabu, Telomoyo, Ungaran	seismic	1995-06-06 00:00:00	9999-12-31 00:00:00	
7	PVMBG Jawa Tengah GPS network B	GPSnet_PVMBG_JawaTengah	Merapi, Merbabu, Telomoyo, Ungaran, Sundoro, Sumbing, Dieng	GPS	2000-01-01 00:00:00	9999-12-31 00:00:00	
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

Monitoring network:
*) required fields to be filled
User allow to upload many monitoring networks (from different methods) simultaneously

Contact Monitoring network Monitoring stations Monitoring instruments Detail data format +

Ready 78%

GVMID > Contibute Data > Submit Data > Spreadsheet template

Monitoring station:
**) required fields to be filled*
User can upload many stations (under different monitoring networks) simultaneously

	A	B	C	D	E	F	G	H
1	Station(s)							
2	<i>Detail description & operational information on monitoring station(s)</i>							
3	<i>(All fields * are required)</i>							
4								
5	*Station name (max 30 characters)	*Station code (max 30 characters)	*Network code(s), in which the station belong to (comma separated)	*Latitude location (-90° to 90°)	*Longitude location (-180° to 180°)	*Elevation (in meters)	*Instrument type (short period seismometer, cGPS/cGNSS, tiltmeter, etc.)	*Station installation type (permanent or non-permanent)
6	Merbabu_SELO_BB	Merbabu_SELO_BB	Seisnet_PVMBG_Jateng_B	-7.490014	110.432283	1490	broadband seismometer	permanent
7	Merbabu_SELO_GPS	Merbabu_SELO_GPS	GPSnet_PVMBG_JawaTengah	-7.490014	110.432283	1490	cGPS/cGNSS	permanent

GVMID > Conttribute Data > Submit Data > Spreadsheet template

Monitoring instrument:
 *) required fields to be filled
 User can upload many instruments simultaneously

1	Instrument(s)								
2	Detail description & operational information on monitoring station(s)								
3	(All fields * are required)								
4									
5	*Instrument name (max 30 characters)	*Instrument code (max 30 characters)	*Station code, in which the instrument installed (max 30 characters)	*Instrument acquisition type (In situ ground-based, Remote ground-based, Airborne/Satellite)	*Instrument type (see example in "Detail data format")	*Start operational time of the the station (YYYY-MM-DD HH:MM:SS in UTC)	*End operational time of the the station (YYYY-MM-DD HH:MM:SS in UTC)	Timing used, with refer to UTC	Installation depth/height (in meters)
6	Merbabu_SELO_Tilt701-2	Merbabu_SELO_Tilt701-2	Merbabu_SELO_Tilt	In situ ground-based	borehole tiltmeter	2019-10-11 00:00:00	2020-12-31 00:00:00	7	-20

GVMID > Contibute Data > Submit Data > Spreadsheet template

The spreadsheet template includes the following columns:

1	Satellite/airplane											
2	Detail description & operational information of satellite(s) or airplane											
3	(All fields * are required)											
4												
5	*Satellite/Airplane name (max 30 characters)	*Satellite/Airplane code (max 30 characters)	COSPAR ID (max 30 characters)	SATCAT/NORAD no. (max 30 characters)	*Vehicle type (A=airplane, S=Satellite)	*Start operational time (YYYY-MM-DD HH:MM:SS in UTC)	*End operational time (YYYY-MM-DD HH:MM:SS in UTC)	Orbital type (max 255 characters)	Orbital height (in km)	Spatial resolution (nadir) (Km)	Cross track size (km)	Return time/rep cycle; in hours o (max 30 charact
6	EOS Aura satellite	AURA	2004-026A	28376	S	2004-04-01 12:00:00	9999-12-31 23:59:59	Polar Sun-synchronous	705			

Satellite/Airplane:
**) required fields to be filled*
User can upload many data simultaneously

GVMID > Contibute Data > Submit Data > Spreadsheet template

The screenshot shows an Excel spreadsheet titled "GVMID_data_template_type-abrev_9Feb2021". The spreadsheet is used for submitting instrument data. It includes a header row with the following columns:

- *Instrument name (max 30 characters)**
- *Instrument code (max 30 characters)**
- where the instrument located (max 30 characters)**
- *Instrument type (D=Deformation, G=Gas, F=Fields, H=Hydrologic, T=Thermal, M=Meteo)**
- *Start operational time (YYYY-MM-DD HH:MM:SS in UTC)**
- *End operational time (YYYY-MM-DD HH:MM:SS in UTC)**
- Spatial resolution (max 30 characters)**
- swath width (in km)**
- pixel size at Nadir (max 30 characters)**
- Cycle/time repeatability (max 30 characters)**
- Instrument technical description (max 255 characters)**
- Instrument operator (max 30 characters)**
- Published reference to cited (max 30 characters)**

An example row for the OMI instrument is shown in row 6:

OMI	OMI	EOS Aura satellite G		2004-07-15 00:00:00	9999-12-31 00:00:00	3 km, binned to 13 x 24 km			1 day	The OMI instrument employs hyperspectral imaging in a push-broom mode to observe solar backscatter radiation in the visible and ultraviolet. The hyperspectral capabilities improve the accuracy and precision of the total ozone amounts and also allow for accurate radiometric and wavelength self calibration over the long term. OMI is a nadir-viewing wide-field-imaging spectrometer, giving daily global coverage. OMI measures the key air quality components such as nitrogen dioxide(NO2), sulfur dioxide (SO2), bromine oxide(BrO), OClO, and aerosol characteristics.	NASA, NIVR, FMI	
-----	-----	----------------------	--	---------------------	---------------------	----------------------------	--	--	-------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------	--

Satellite/Airplane instrument:
 *) required fields to be filled
 User can upload many data simultaneously

GVMID > Contibute Data > Upload Data

https://wovodat.org/populate/gvmid_input.php



GVMID Data on Volcano Monitoring Infrastructure

[Home](#) [About GVMID](#) [Visualization](#) [Contribute Data](#) [Feedbacks & Contact](#) [Logout](#)

Home > Contribute Data

Input Data

If you wish to upload the monitoring infrastructure datasets to GVMID, please organize your data following the Excel template format [here](#), then upload your Excel file using upload form below:

Please write your name, email and observatory/institution name before submitting the file:

Christina Widiwijayanti
c.widiwijayanti@gmail.com
Earth Observatory of Singapore

GVMID_data_...type-abbrev.xlsx

When spreadsheet ready, upload using online form. GVMID developer's team will help convert and upload them into the database.

Note:

Make sure to write down your contact details and your institutional affiliation before submitting the file. This will facilitate tracking the data.

Feedbacks & contact us

If user wish to contact GVMID developer' team or to give any feedback to improve the GVMID web interface functionality and design, database schema and format structure, or documentation, *please fill in the online form and complete with your full name and email address.* :

https://wovodat.org/populate/contact_us_form_gvmid.php



Contact Us

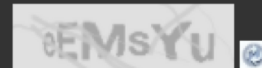
(All fields * are required)

*Subject:

*Message:

*Name:

*Email:



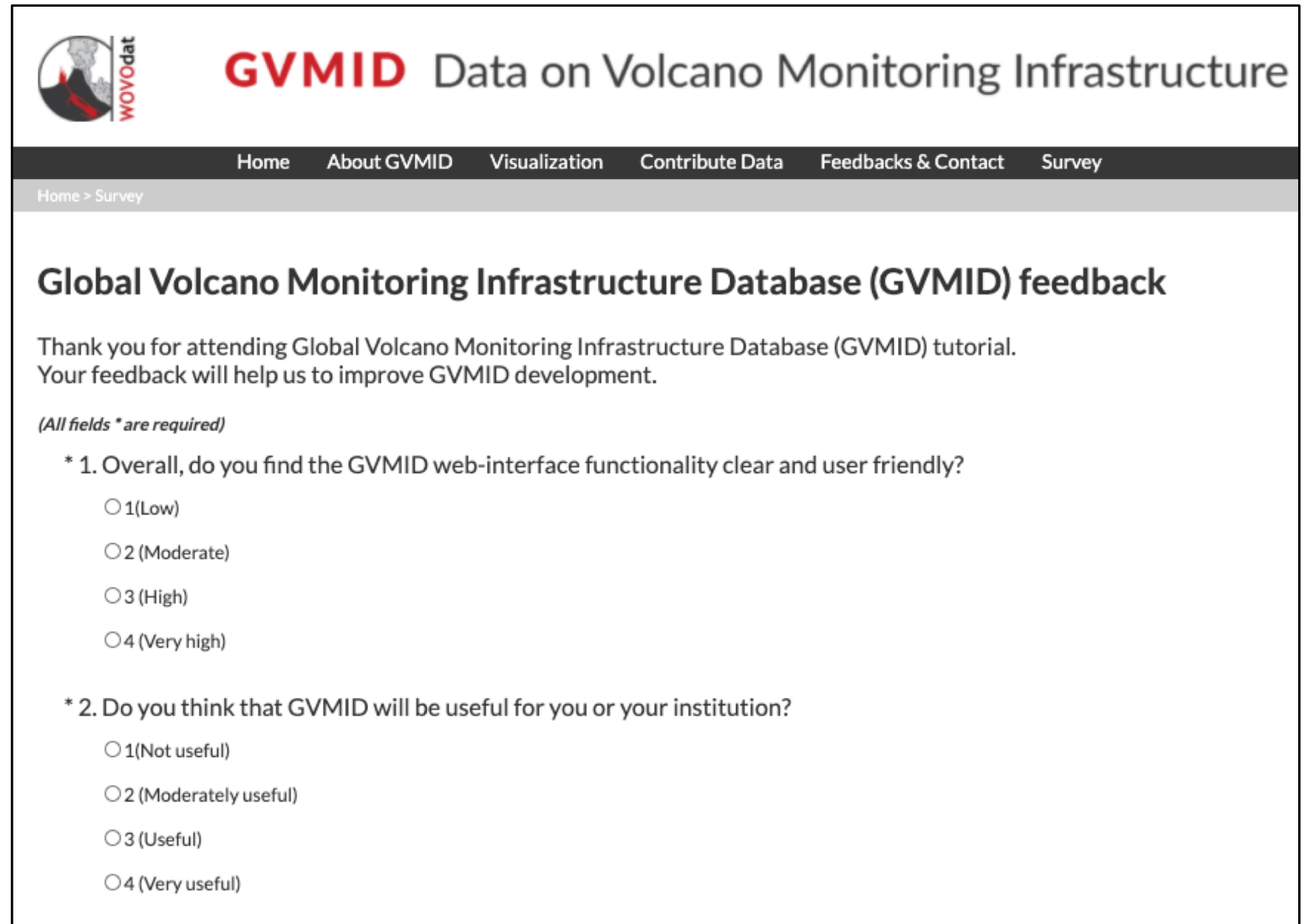
*Type the above security code:

Online survey

<https://wovodat.org/populate/survey.php>

Please fill in the survey,
All those mark with (*) are required.

Thank you



The screenshot shows the GVMID website header with the logo and navigation menu. The main content area is titled "Global Volcano Monitoring Infrastructure Database (GVMID) feedback" and contains a thank-you message and two survey questions with radio button options.

GVMID Data on Volcano Monitoring Infrastructure

Home About GVMID Visualization Contribute Data Feedbacks & Contact Survey

Home > Survey

Global Volcano Monitoring Infrastructure Database (GVMID) feedback

Thank you for attending Global Volcano Monitoring Infrastructure Database (GVMID) tutorial.
Your feedback will help us to improve GVMID development.

*(All fields * are required)*

* 1. Overall, do you find the GVMID web-interface functionality clear and user friendly?

- 1(Low)
- 2 (Moderate)
- 3 (High)
- 4 (Very high)

* 2. Do you think that GVMID will be useful for you or your institution?

- 1(Not useful)
- 2 (Moderately useful)
- 3 (Useful)
- 4 (Very useful)

Thank you!
Looking forward to your feedback and contribution!



GVMID Data on Volcano Monitoring Infrastructure

A screenshot of the GVMID website. The top navigation bar includes links for Home, About GVMID, Visualization, Contribute Data, and Feedbacks & Contact. A dropdown menu is open under 'About GVMID', showing options for 'More About GVMID', 'Documentation', and 'User Manual'. The main content area features a background image of a coastal town on a cliffside. Overlaid on this image is a circular logo with a volcano and the text 'Cities on VOLCANOES'. A red banner on the right side of the page announces a '2021 Workshop on volcano monitoring infrastructure on the ground and in space' in Heraklion, Crete, Greece, from February 18-22, 2021, at 8am-12pm (EST). A 'Click to see more details.' link is provided below the banner.

Home About GVMID Visualization Contribute Data Feedbacks & Contact

More About GVMID

Documentation

User Manual

Heraklion, Crete, Greece

2021 Workshop on volcano monitoring infrastructure on the ground and in space

Introduction and rationale of the Global Volcano Monitoring Infrastructure Database: Focus on ground-based observations
Date: 18 – 22 Feb 2021
Time: 8am-12pm (EST)
[Click to see more details.](#)

The Global Volcano Monitoring Infrastructure Database **GVMID**, is aimed at documenting and improving capabilities of volcano monitoring from the ground and space. GVMID is closely related to WOVODat and WOVO (World Organization of Volcano Observatories), and presently hosted at the Earth Observatory of Singapore.