

Introduction to Using WOVodat (*version February 2014*)

WOVodat is a web-accessible database of worldwide historical volcanic unrest. Open user access which is launched during 2013 IAVCEI Kagoshima meeting allow registered user to navigate into WOVodat website (www.wovodat.org). Through this website, users will be able to obtain general information about WOVodat and find 4 first-level menu selections:

- **Documentation**: Users may consult and download documentations (user manual, SQL schema, XML format, table formats). A WOVodat installable standalone package is available for observatories that want to adapt WOVodat for their own data management.
- **Volcano (data)**: Registered users will be able to interactively query the database and view volcano monitoring data set. Visualization tools in WOVodat presently enable comparisons of processed monitoring data, e.g., earthquake hypocenters, displacements, and gas flux time series from different episodes of unrest from a single volcano, or from unrest of different but analogous volcanoes. The data set is still in an early stage of population, but contains enough data to show users its potential.
- **Submit Data**: Currently we offer 3 options for users to contribute data: (a) free format or original observatory format, (b) WOVodat CSV standard format, and (c) Customary/known CSV format. Data can also be contributed using an online form and uploaded into SQL database following WOVodat XML standard format.
- **Contact**: We invite scientists from volcano observatories, universities, and research institutions to participate in the growing of WOVodat database by sharing their data and their expertise in developing visualization tools. The email address for the WOVodat developer team is given under Contact.

1. **Creating an account:**

Fill in registration form through http://www.wovodat.org/populate/regist_form.php

User registration form
Welcome to the registration form for WOVodat!
(the fields preceded by * are required)

*Username:

*Password (≥ 6 characters):

*Confirm password:

*Email address:

First name:

Last name:

*Observatory:

Address1:

Address2:

City:

State, Province or Prefecture:

Country:

Postal code:

Web address:

Phone:

Phone 2:

Fax:

Comments:

If you belong to one of the observatories or institutions listed in the pull-down menu, please click on that affiliation. If not, please click on 'Other' and fill in your affiliation.

*Type the above security code:

Figure 1. WOVodat user registration form

Registration waiting confirmation
 Thank you for registering to WOVODat. An email was sent to your email address (c.widiwijayanti@gmail.com) for you to confirm registration. Once you receive it, please click on the link provided.
 If you do not receive any email after several hours, please check your Spam/Junk email inbox. If it is not there, try to register again and make sure that the email address you entered is valid.
 Feel free to contact us if you have any question or issue.

Figure 2. Registration process

When the filled form is successfully submitted to the system, an email will be sent to registered email address. To confirm the registration, user will required clicking the link provided in the email.

Registration successful!
 Thank you for your contribution to WOVODat.
 You may now go back to the welcome page and log in.

Figure 3. Registration confirmation

2. **Documentation:** <http://www.wovodat.org/doc/>

Users may consult and download documentations (user manual, SQL schema, XML format, table formats, etc.).

The screenshot shows the WOVODat website interface. At the top, there are logos for WOVO, Earth Observatory of Singapore, and Smithsonian National Museum of Natural History. The main navigation bar includes links for Home, Documentation, Volcano, SubmitData, and Contact. Below this, there are sections for 'Partners' and 'WOVO-Observatories'. The central content area features a 'List of Documents Available' section with a list of links for manuals, tables, and schemas. To the left of this list is a diagram illustrating the data flow from users to the server and back to users.

Figure 4. WOVODat documentations available for online view or download through our website.

A WOVODat installable standalone package is available for observatories that want to adapt WOVODat for their own data management (http://www.wovodat.org/installing/download_installable.php)

The screenshot shows two sections of the WOVODat website. The left section is titled 'Installing WOVODat Structure on own system' and contains text about installing the database template and using a web-based GUI. The right section is titled 'Downloadable Packages' and lists links for downloading the database template and the UI tool, with a dropdown menu for selecting an observatory.

Figure 5. WOVODat package is downloadable, together with UI tools and installation README file.

3. **Volcano(data):** http://www.wovodat.org/precursor/index_unrest_devel_v5.php

Registered users will be able to interactively query the database and view volcano monitoring dataset. Visualization tools in WOVOdat presently enable comparisons of processed monitoring data, e.g., earthquake hypocenters, displacements, and gas flux time series from different episodes of unrest from a single volcano, or from unrest of 2 different but analogous volcanoes. Nearly all data in WOVOdat are time-stamped and georeferenced, so that they can be studied in both space and time. The data set is still in an early stage of population, but contains enough data to show users its potential.

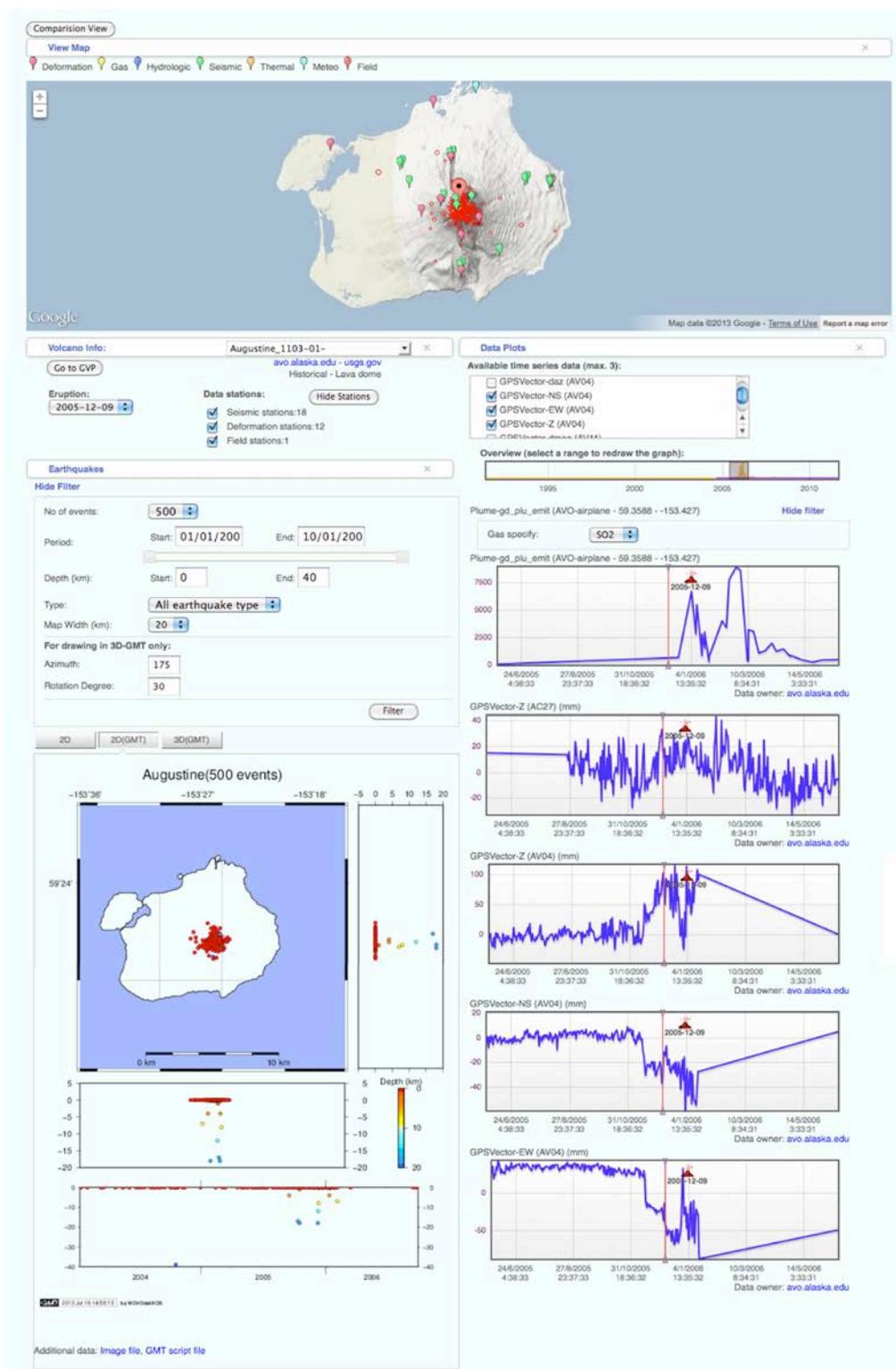


Figure 3. Example of visualization: precursory data of Augustine eruption 5 Dec 2005.

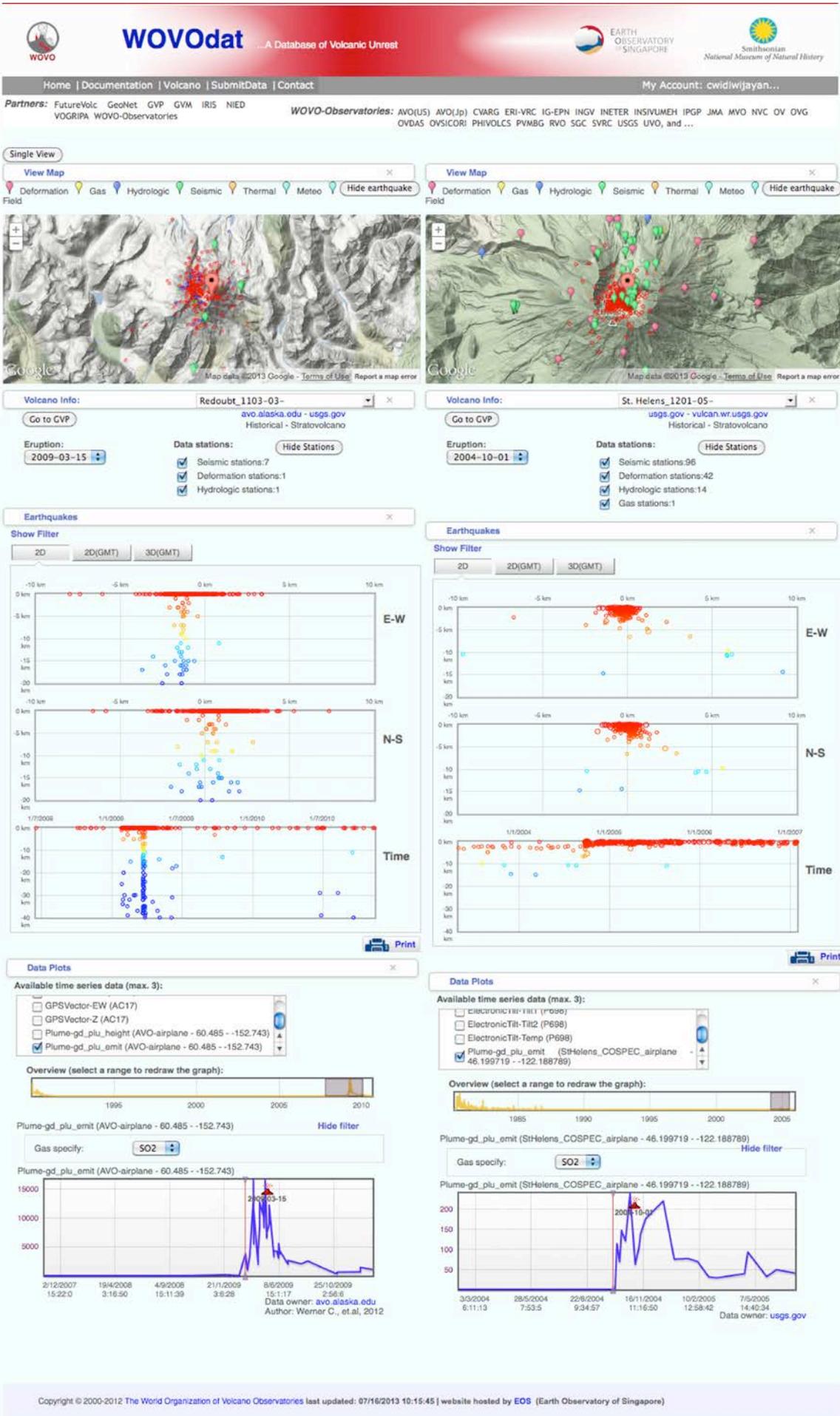


Figure 4. Data comparison between Redoubt (2009) and St. Helens (2004) eruptions.

4. **SubmitData:** http://www.wovodat.org/populate/home_populate.php

Currently we offer 3 options for users to contribute data:

- (a) free format or original observatory format,
- (b) WOVodat CSV standard format, and
- (c) Customary/known CSV format.

Data can also be contributed using an online form and uploaded into SQL database following WOVodat XML standard format.

SUBMIT DATA
For now, the database only accepts data in **WOVodat-XML (WOVOml)** format. Please refer to **WOVodat1.1** documentations for detail information on data format.

We offer 3 options for contributors to submit data:

- **Submission of original observatory data format.**
Send a file of any format to WOVodat; and let the WOVodat team convert and upload it to the database.
- **Submission of spreadsheet (comma-separated values CSV) file. (<2Mb):**
Send comma-separated values CSV file in WOVodat1.1 standard/compliant format;
 - (a) **CSV of monitoring system:**
network, station, instrument, airplane, satellite
 - (b) **CSV of data:**
seismic, deformation, gas, hydrology, fields, thermal, meteoSend comma-separated values CSV file in customary format; known/registered by WOVodat:
 - (c) **CSV of customary format data**

Option below appears for admin or developer team only

- **Submission of small amount of data through [online forms](#).**
bibliographic, inferred processes, volcano, Observation about volcanic activity, observatory contact information
- **Upload WOVOMl file**
Upload of WOVOMl format file to MySQL database

Checking Tools:
[\[1\]Table check](#) [\[2\]Incoming File](#)

Figure 5. WOVodat online UI for data submission (conversion and upload).

Submitting data through online conversion

(a) Monitoring system

Conversion of Monitoring System

Input: CSV file of network, station, or instrument information. The data must follow the WOVodat1.1 standard format

Observatory (data owner):
Philippines, PHIVOLCS

Volcano:
Pinatubo

Type of Data to convert:
...

SeismicNetwork
SeismicStation
SeismicInstrument
SeismicComponent
DeformationNetwork
DeformationStation
DeformationInstrument_General
DeformationInstrument_Tilt/Strain
GasNetwork
GasStation
GasInstrument
HydrologicNetwork
HydrologicStation
HydrologicInstrument
ThermalNetwork
ThermalStation
ThermalInstrument
FieldsNetwork
FieldsStation

FieldsInstrument
MeteorologicalNetwork
MeteorologicalStation
MeteorologicalInstrument
Airplane
Satellite

Browse file to: [Select] [Browse...]

(b) Monitoring data

Conversion of Monitoring Data

Input: CSV file of seismic, deformation, gas, hydrology, field, or thermal data. The data must follow WOVOdat1.1 standard format

Observatory (data owner):

Volcano:

File content to convert:

Browse file to:

- EventDataFromNetwork
- EventDataFromSingleStation
- IntensityData
- SeismicTremor
- IntervalSwarmData
- RSAMData
- SSAMData
- RepresentativeWaveform
- ElectronicTiltData
- TiltVectorData
- StrainMeterData
- EDMData
- AngleData
- GPSData
- GPSVectors
- LevelingData
- InSARImage and InSARData
- DirectlySampledGas
- SoilEffluxData

- PlumeData
- HydrologicData**
- MagneticFieldsData
- MagnetorVectorData
- ElectricFieldsData
- GravityData
- GroundBasedThermalData
- ThermalImage and ThermalImageData
- MeteorologicalData

(c) Customary format data

Conversion of Customary-format Data

Input: monitoring data, following a specific format which already listed in the WOVOdat

Observatory (data owner):

Data owner 2 (Optional):

Data owner 3 (Optional):

Volcano:

File content to convert:

Browse file to:

- IntervalSwarmData
- ElectronicTiltData
- ElectronicTiltData(Post Processed)
- RSAM

C-1. Interval Swarm Data

Conversion of Customary-format Data

Input: monitoring data, following a specific format which already listed in the WOVOdat

Observatory (data owner):
Philippines,PHIVOLCS

Data owner 2 (Optional):
...

Data owner 3 (Optional):
...

Volcano:
Bulusan

File content to convert:
IntervalSwarmData

Station:
Inlagadian

Browse file to convert:

C-2. Electronic tilt data (post processed)

Conversion of Customary-format Data

Input: monitoring data, following a specific format which already listed in the WOVOdat

Observatory (data owner):
Philippines,PHIVOLCS

Data owner 2 (Optional):
...

Data owner 3 (Optional):
...

Volcano:
Bulusan

File content to convert:
ElectronicTiltData(Post Proc)

Station:
KWBT

Please choose Interval length:
1 minute
10 minutes
20 minutes
1 hour
2 hours

Browse Radial Component file to convert:
Browse Tangential Component file to convert:

C-3. Electronic Tilt Data

Conversion of Customary-format Data

Input: monitoring data, following a specific format which already listed in the WOVOdat

Observatory (data owner):
Philippines,PHIVOLCS

Data owner 2 (Optional):
...

Data owner 3 (Optional):
...

Volcano:
Bulusan

File content to convert:
ElectronicTiltData

Station:
KWBT

Please choose Process Type:
Raw
Processed
Raw

Browse file to convert:

C-4. RSAM

Conversion of Customary-format Data

Input: monitoring data, following a specific format which already listed in the WOVOdat

Observatory (data owner):
Philippines,PHIVOLCS

Data owner 2 (Optional):
...

Data owner 3 (Optional):
...

Volcano:
Bulusan

File content to convert:
RSAM

Station:
San Roque

Please Enter RSAMSSAM Code here:

Browse file to convert:

Example of conversion processes: *conversion of seismic-component information*

1. User input: online form and submit CSV file (*following WOVodat standard format*)

Input CSV format: si_cmp table

si_cmp_id	si_cmp_code	si_id	si_cmp_name	si_cmp_type	si_cmp_resp
	VPMGW_BB_BHE		GuralpBroadband Horizontal N-S component	horizontal E-W	frequency range: 0.04-25 Hz

si_cmp_band	si_cmp_samp	si_cmp_icode	si_cmp_orient	si_cmp_sens
Broadband	50	BHE	Clockwise,E=90,reversed=270	4.378540e+09 @ 1.000e+00 Hz (SEED Stage 0)

si_cmp_depth	si_cmp_ori	si_cmp_com	cc_id	cc_id2	cc_id3	di_tlt_loaddate	di_tlt_pubdate	cc_id_load	cb_ids
2	0	comments					2010-01-31 12:00:00		

2. Converting CSV to WOVOML (WOVodat-XML) format.

Converting Data ...

Time: 2012-02-02 13:50:21

Observatory Name: PHIVOLCS
 Volcano Name: Parker
 File-type: SeismicComponent
 Network Name: Parker Seismic Network
 Station Name: Parker_west
 Instrument Name: VPMGW_BB

Input File Name: VPMGW_BB_BHZ_si_cmp.csv
 Uploaded Total CSV rows: 1 rows
 Input File Size: 367 bytes

Convert File Name: VPMGW_BB_BHZ_si_cmp.xml

Successfully converted from VPMGW_BB_BHZ_si_cmp.csv file to VPMGW_BB_BHZ_si_cmp.xml file...

If you would like to see the result of VPMGW_BB_BHZ_si_cmp.xml, please click here to download it:

[Download XML file](#)

XML format: *si_cmp* (seismic component)

```
<?xml version="1.0" encoding="UTF-8" ?>
<wovoml xmlns="http://www.wovodat.org" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
version="1.1.0" xsi:schemaLocation="http://www.wovodat.org/WOVOdatV1.xsd">
  <MonitoringSystems>
    <SeismicComponents instrument="VPMGW_BB" owner1="PHIVOLCS">
      <SeismicComponent code="VPMGW_BB_BHE" instrument="VPMGW_BB" owner1="PHIVOLCS">
        <name>GuralpBroadband Horizontal N-S component</name>
        <type>horizontal E-W</type>
        <comments>comments</comments>
        <respDesc>frequency range: 0.04-25 Hz</respDesc>
        <sampleRate>50</sampleRate>
        <seedBandCode>Broadband</seedBandCode>
        <seedInstCode>BHE</seedInstCode>
        <seedOrientCode>Clockwise,E=90,reversed=270</seedOrientCode>
        <sensitivity>4.378540e+09 @ 1.000e+00 Hz (SEED Stage 0)</sensitivity>
        <depth>2</depth>
      <startTime>2010-06-01 12:00:00</startTime>
    </SeismicComponent>
  </SeismicComponents>
</MonitoringSystems>
</wovoml>
```

3. Upload XML file to MySQL database.

Are the data issued from a publication? Yes No

Select file to upload:

WOVOML file :
/Users/eoschristina/Desktop/PHIVOLCS_2012,

Please confirm upload

You are going to upload data to WOVODat. These data will be open to the public 2 years after date of occurrence or (if the latter is not available) date of upload.

This file contains the following data

- Seismic instrument: 1 object

Data stored in the database.

si_id	si_code	ss_id	si_name	si_type	si_range	si_gain	si_filter	si_ncomp	si_resp	si_resp_desc	si_time	si_time_utc	si_time_utc	si_comments	cc_id	cc_load	cc_load	si_loaddate	si_pubdate	cc_id_load	cc_load
1569	VPMGW_BB	3308	Guralp CNS-40T	nominal 130dB	5.69e+08	High pass filter	3	frequency range: 0.04 - 25 Hz	NULL	2008-12-10 04:00:00	NULL	9999-12-31 23:59:59	NULL	comments	169	NULL	NULL	2012-03-01 07:53:42	2010-12-19 04:00:00	199	NULL
1570	VPRST_SP	3308	L4-3816	NULL	5.62e+07	NULL	1	frequency range: 1-10 Hz	NULL	2008-01-11 04:00:00	NULL	9999-12-31 23:59:59	NULL	comments	169	NULL	NULL	2012-02-01 07:54:19	2010-01-11 04:00:00	199	NULL
1571	VPHSE_SP	3307	L4-3816	NULL	5.62e+07	NULL	1	frequency range: 1-10 Hz	NULL	2008-01-11 04:00:00	NULL	9999-12-31 23:59:59	NULL	comments	169	NULL	NULL	2012-02-01 07:54:46	2010-01-11 04:00:00	199	NULL

Submitting data through online form

Upload Data with Form

Type of Data to upload:

- **Bibliographic**
- Inferred processes
 - Hydrothermal system interaction
 - Magma movement
 - Buildup of magma pressure
 - Volatile saturation
 - Regional tectonics interaction
- Volcano
 - Volcano
 - Volcano Information
 - Magma chamber
 - Tectonic setting
- Observation about volcanic activity
- Observatory Contact Information

⇒ Bibliography table

Upload form for Bibliographic Information. Table : cb

The fields preceded by an asterisk (*) are required.

*Authors/Editors:	<input type="text"/>
*Publication year (YYYY):	<input type="text" value="YYYY"/>
*Paper Title:	<input type="text"/>
Journal Name:	<input type="text"/>
Journal Volume:	<input type="text"/>
Publisher Name:	<input type="text"/>
Page Numbers:	<input type="text"/>
Digital Object Identifier:	<input type="text"/>
International Standard Book Number (ISBN):	<input type="text"/>
Web Address (URL):	<input type="text"/>
Email address of observatory or laboratory:	<input type="text"/>
Keywords (Please separate each group of keywords with a comma):	<input type="text"/>
Comments:	<input type="text"/>

⇒ Hydrothermal system interaction

Upload form for Hydrologic System Interaction Information. Table : ip_hyd

The fields preceded by an asterisk (*) are required.

*Unique Code:	<input type="text"/>
*Volcano Name:	Select Volcano
Inference time:	YYYY-MM-DD HH:MM:SS
Inference time uncertainty:	<input type="text"/>
*Start Time:	YYYY-MM-DD HH:MM:SS
Start Time Uncertainty:	YYYY-MM-DD HH:MM:SS
End Time:	YYYY-MM-DD HH:MM:SS
End Time Uncertainty:	YYYY-MM-DD HH:MM:SS
*Heated groundwater:	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown
*Pore destabilization:	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown
*Pore deformation:	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown
*Hydrofracturing:	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown
*Boiling induced tremor:	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown
*Absorption of soluble gases:	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown
*Change in equilibrium species:	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown
*Boiling until dry chimneys are formed:	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown
*Source of data:	<input type="radio"/> Digitized/Bibliography <input checked="" type="radio"/> Original from observatory
Comment:	<input type="text"/>
*Institution/Observatory:	Select Observer.
Second Institution/Observatory:	Select Institution/Obs.
Third Institution/Observatory:	Select Institution/Obs.
Publish Date:	YYYY-MM-DD HH:MM:SS
Bibliographic: (Hold down the Ctrl to select multiple options)	Select bibliographic Barrancos, J., Roselló, J.I., Calvo, D., Padrón, P., Melián, G., Hernández, P.A., Pére BCVN (2002) Bruno, N., Caltabiano, T., Grasso, M.F., Porto, M., Romano, R. (1994) SO2 flux frc

5. **Contact:** http://www.wovodat.org/populate/contact_us_form.php

We invite scientists from volcano observatories, universities, and research institutions to participate in the growing of WOVOdat database by sharing their data and their expertise in developing visualization tools.

Contact us via email:

Christina Widiwijayanti (cwidiwijayanti@ntu.edu.sg)