

## Introduction to Using WOVOdat (version November 2018)

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

- **News:** *Users will be able to get latest news of WOVOdata*
  
- **Visualization:**
  - **Single volcano view:** Shaded relief and monitoring stations, with 2D or 3D hypocenter display, and time-series for multiple parameters, including pre-defined default or user selected small number of parameters.
  - **Side by side comparisons:** Similar display as described above, but also allow comparing 2 unrests (within the same volcano or between 2 volcanoes).
  - **Temporal evolution of unrest:** Plotting of hypocenters and other parameters through time, slowly enough that the user can see how the unrest developed in time and space.
  - **Classic episodes of unrest:** This page will bring up summaries of unrest at selected “classic” cases. For now we simply have a downloadable PDF file for the **Pinatubo 1991** eruption but in the future it will be a package where all the data will be an interactive standalone visualization and download module.
  
- **Data Download:**
  - **Data search by volcano:** Search unrest data availability for a selected volcano. The results will be displayed in table, with link to data visualization (single volcano view) and data download.
  
  - **Boolean searches:** By selecting time period and selected data type, user will be directed to data visualization (single volcano view) or data download link.
    - a. For analogous volcanoes (searching keys from Volcano Table)
    - b. For analogous episodes of unrest (searching for episodes that satisfy specified criteria, e.g.,  $M > 4$ , etc.
  
- **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.
  
- **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.

- **Contact Us:** 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 and other utilities (optimisazion of Boolean search, pattern recognition, data display, etc.). For further information, please contact WOVOdat developer team through [wovodat@wovodat.org](mailto:wovodat@wovodat.org).
- **WOVOdat Tools Index:** Contains a compilations of all tools in WOVOdat. We expect to develop and adapt various application tools including statistical analysis, machine learning etc, and these will be added here

## 1. Creating an account:

Fill in the registration form through [http://www.wovodat.org/populate/regist\\_form.php](http://www.wovodat.org/populate/regist_form.php)

**WOVodat** Data on Volcanic Unrest

Home News Visualization Data Download Submit Data Documentation Contact Us LOGIN WOVodat Tools Index

Home > Register

### User registration form

For detailed information about how to register, please see here.  
(All fields \* are required)

\*Username:

\*Password (andge; 6 characters):

\*Confirm password:

\*Email address:

First name:

Last name:

...

\*Observatory:   
(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.)

Address1:

Address2:

City:

State, Province or Prefecture:

Country:

Postal code:

Web address:

Phone:

Phone 2:

Fax:

Comments:

la8dnC

\*Type the above security code:

I agree to WOVodat Data Policy

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WOVODAT

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 into the system, an email will be sent to registered email address. To confirm the registration, the user will be required to click 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. **News:** <http://www.wovodat.org/about/news.php>



Figure 4. News page

3. **Visualization:** [http://www.wovodat.org/precursor/index\\_unrest\\_devel\\_v6.php](http://www.wovodat.org/precursor/index_unrest_devel_v6.php)

**3.1 - Single volcano view:** Shaded relief and monitoring stations, with 2D or 3D hypocenter display, and time-series for multiple parameters, including pre-defined default or user selected small number of parameters.

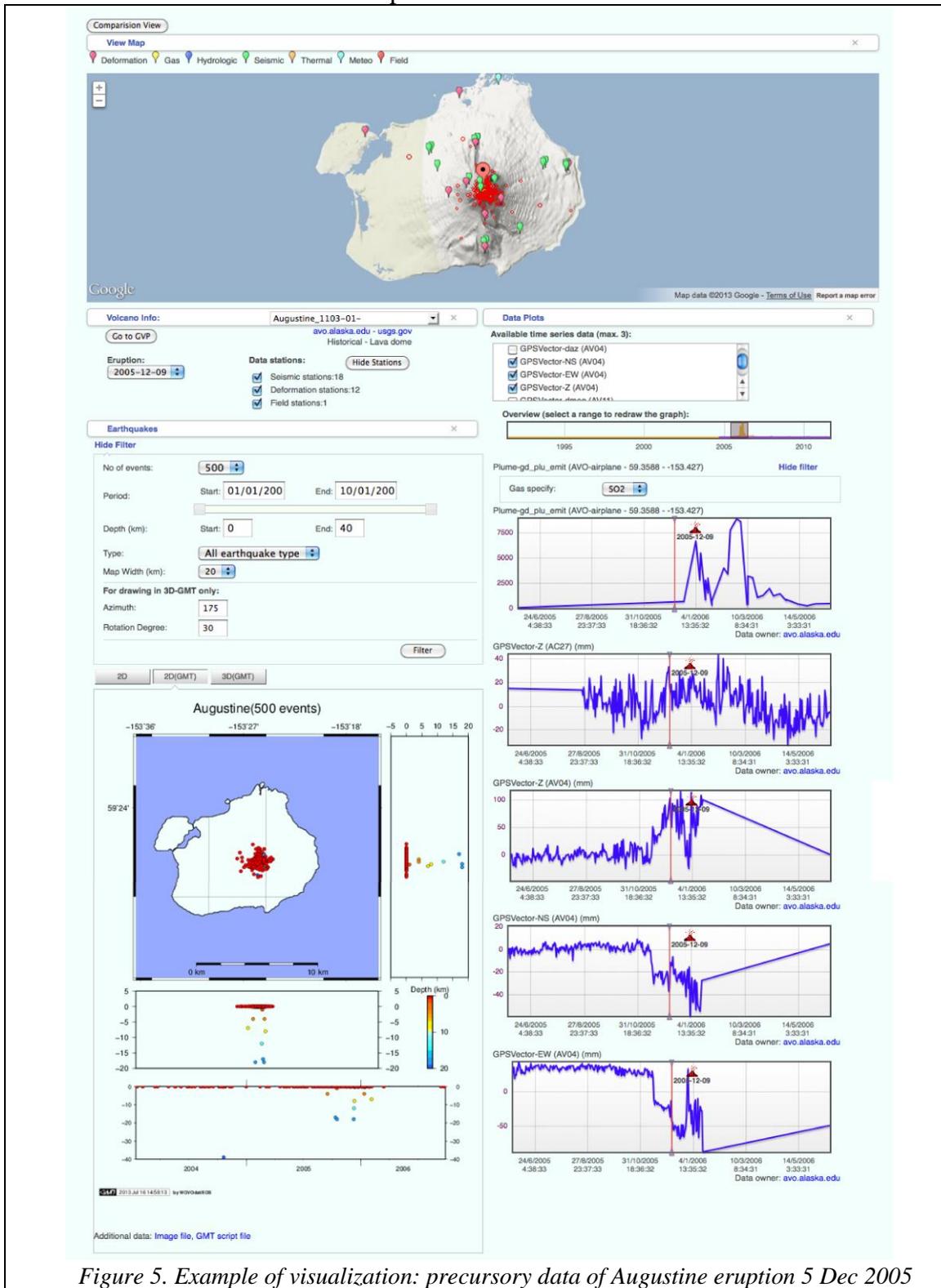


Figure 5. Example of visualization: precursory data of Augustine eruption 5 Dec 2005



3.3 - Temporal evolution of unrest: <http://www.wovodat.org/eruption/index.php>  
 Plotting of hypocenters and other parameters through time, slowly enough that the user can see how the unrest developed in time and space.

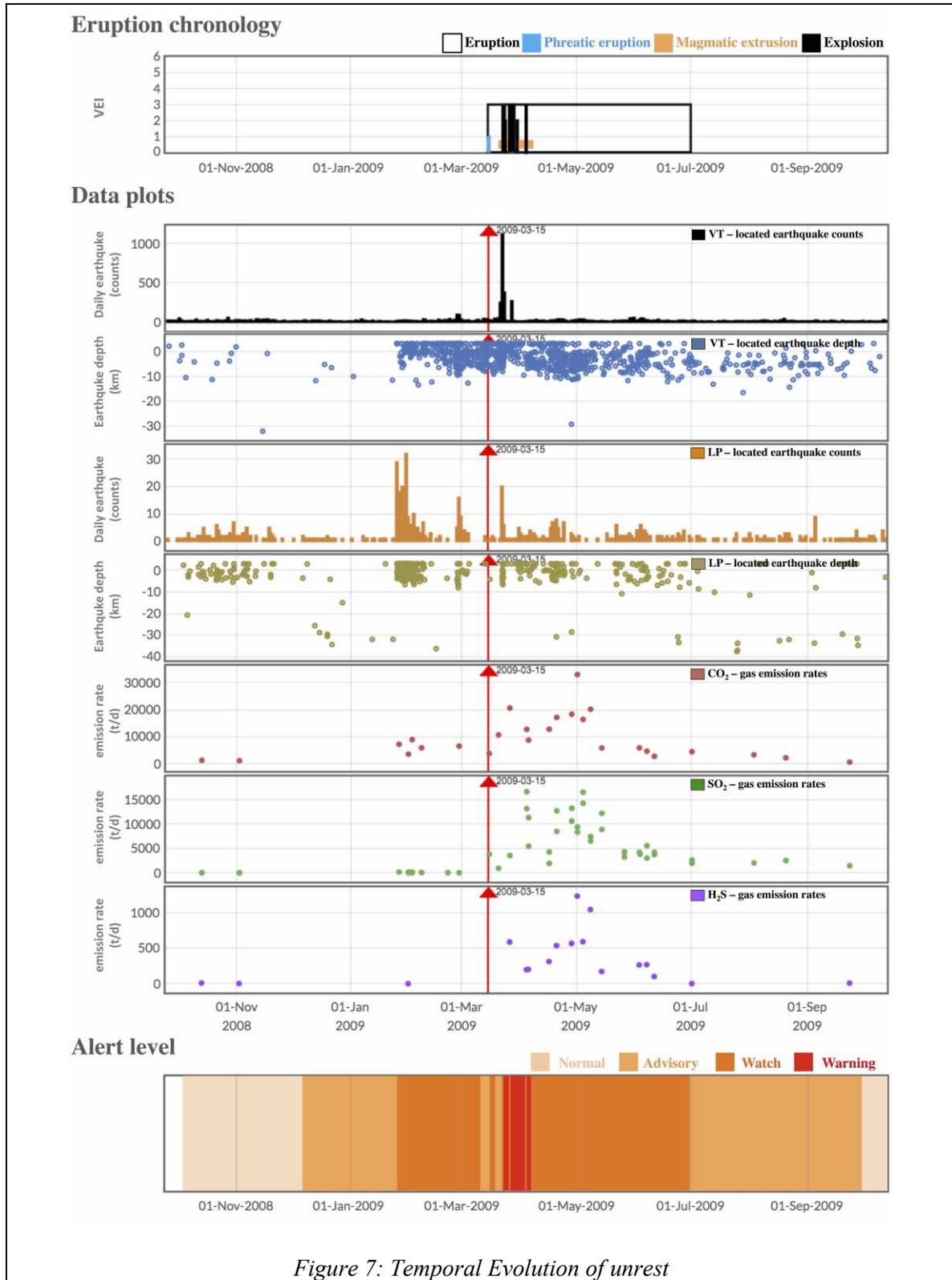


Figure 7: Temporal Evolution of unrest

### 3.4 - Classic episodes of unrest : <http://www.wovodat.org/epiunrest/classicepisodes.php>

This page will bring up summaries of unrest at selected “classic” cases.



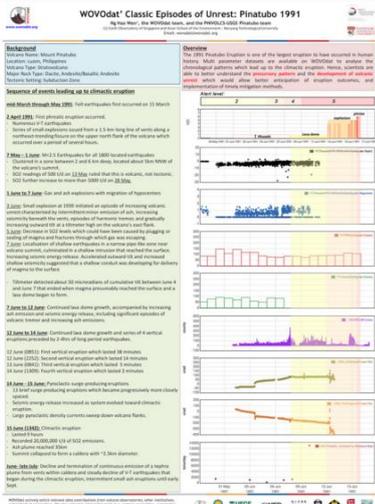
# WVOdat Data on Volcanic Unrest

Home
News
Visualization
Data Download
Submit Data
Documentation
Contact Us
LOGIN
WVOdat Tools Index

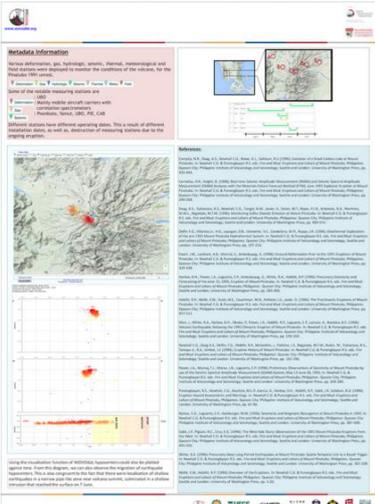
Home > Visualization > Classic Episodes of Unrest

## Classic Episodes of Unrest

This page will bring up summaries of unrest at selected “classic” cases, where users will be directed to 2 visualization options: evolving eruption or spatiotemporal display. Pinatubo Classic Unrest example can be downloaded in PDF file.



Example of Pinatubo Classic Unrest page 1.



Example of Pinatubo Classic Unrest page 2.

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Figure 8: Classic episodes of unrest

#### 4. Data Download:

##### 4.1 - Data search by volcano:

[http://www.wovodat.org/populate/convertie/Volcano\\_zone/main.php?data\\_type=zone\\_index](http://www.wovodat.org/populate/convertie/Volcano_zone/main.php?data_type=zone_index)

Search unrest data availability for a selected volcano. The results will be displayed in table, with link to data visualization (single volcano view) and data download.



Figure 9: Google map, showing location of worldwide Holocene volcanoes with data (red) and without data (yellow).

Select Volcano :

Historical Eruption :

Boundary  Radial  Square

Distance range :  to  Km

Depth range :  to  Km

Time range :  to

Magnitude range :  to

Earthquake type :  R  PF  G  Q  V  VT  VT\_D  VT\_S  H  H\_HLF  H\_LHF  
 LF  LF\_LP  LF\_T  LF\_ILF  VLP  E  U  O  X  RF

[http://www.wovodat.org/populate/convertie/Volcano\\_zone/main.php?data\\_type=hypocenter\\_search&volcanoes=Aso&radius=0,30&depth=-5,30&time=0000-00-00 00:00:00,2018-11-16 09:26:11&magnitude=-1,9&type=R,PF,G,Q,V,VT,VT\\_D,VT\\_S,H,H\\_HLF,H\\_LHF,LF,LF\\_LP,LF\\_T,LF\\_ILF,VLP,E,U,O,X,RF&name=your\\_name&email=your\\_email&observatory=your\\_institute](http://www.wovodat.org/populate/convertie/Volcano_zone/main.php?data_type=hypocenter_search&volcanoes=Aso&radius=0,30&depth=-5,30&time=0000-00-00 00:00:00,2018-11-16 09:26:11&magnitude=-1,9&type=R,PF,G,Q,V,VT,VT_D,VT_S,H,H_HLF,H_LHF,LF,LF_LP,LF_T,LF_ILF,VLP,E,U,O,X,RF&name=your_name&email=your_email&observatory=your_institute)

Figure 10: Table showing volcano information and link to GVP web-page, WOVodat visualization tools, and advance data query form.

## EARTHQUAKE HYPOCENTERS AT VARIOUS DISTANCE FROM THE VOLCANO

Export to CSV: [csv](#) Plot Map: [map](#) Plot 3D-Map: [3D map](#) New Search: [search](#)

Showing 1 to 100 out of 27600 rows [Back](#) [Next](#)

| Date-time                 | Latitude | Longitude | Depth | Magnitude | Magnitude type | Earthquake type | Distance | Data Owne |
|---------------------------|----------|-----------|-------|-----------|----------------|-----------------|----------|-----------|
| 1928-08-22<br>10:36:13.48 | 32.74233 | 130.84167 | 8     | 3.8       | MJ             | R               | 29.1205  | JMA       |
| 1928-09-28<br>17:05:51.61 | 32.873   | 130.88633 | 5     | 4.2       | MJ             | R               | 20.5333  | JMA       |
| 1928-11-17<br>18:52:08.69 | 33.07867 | 130.98183 | 0     | 3.8       | MJ             | R               | 24.8444  | JMA       |
| 1928-12-22<br>04:56:50.36 | 33.1305  | 131.0395  | 14    | 3.2       | MJ             | R               | 28.4277  | JMA       |
| 1928-12-22<br>08:17:32.22 | 33.0785  | 131.10767 | 18    | 4.6       | MJ             | R               | 21.9615  | JMA       |
| 1928-12-22<br>12:35:15.58 | 33.05133 | 130.88233 | 0     | 3.3       | MJ             | R               | 28.1805  | JMA       |
| 1929-01-12<br>00:33:04.66 | 32.85167 | 130.828   | 0     | 3.9       | MJ             | R               | 26.1687  | JMA       |

*Figure 11: Query result, list of event' hypocenters, are shown in table. The data can be downloaded also in CSV format as well as plot in Google map.*

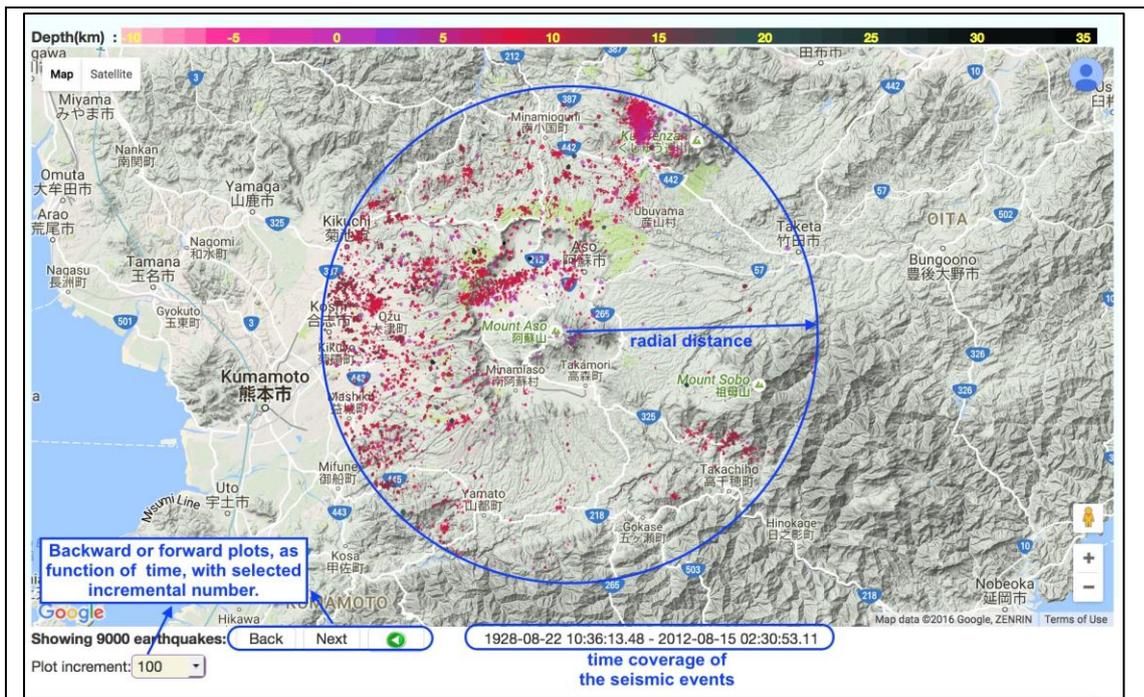


Figure 12: Backward and forward hypocenter plot, by selected incremental number, as function of time

Please provide information before starting data download.

\*Name:

\*Email:

\*Institution/Observatory:

I agree to WOVodat Data Policy

Submit

Figure 13: User wish to download the data, will require to fill up personal detail form and accepting WOVodat data policy. Any data download, will automatically tracked and registered in "ddu" table.

## ddu

Table comments: Keep track who download which data type

| Column            | Type        | Null | Default | Comments  |
|-------------------|-------------|------|---------|---|
| ddu_id            | smallint(5) | No   |         | Download data user id                                 |
| cr_id             | smallint(5) | Yes  | NULL    | Log in user id like download as a registered user     |
| ddu_name          | varchar(30) | No   |         | Download data user name like download as a guest user |
| ddu_email         | varchar(30) | No   |         | Email   |
| ddu_obs           | varchar(30) | Yes  | NULL    | Download data user obs                                |
| ddu_ip            | varchar(30) | No   |         | Download data user's IP address                       |
| ddu_time          | datetime    | No   |         | The time user download data                           |
| ddu_country       | varchar(30) | Yes  | NULL    | Country where user download data                      |
| ddu_city          | varchar(30) | Yes  | NULL    | City where user download data                         |
| vd_name           | varchar(50) | No   |         | User download data for this vol                       |
| cc_id             | smallint(5) | No   |         | To keep data owner Id                                 |
| ddu_dataType      | varchar(30) | No   |         | User download data type                               |
| ddu_dataStartTime | datetime    | No   |         | User download data start time                         |
| ddu_dataEndTime   | datetime    | No   |         | User download data end time                           |

### Indexes

| Keyname        | Type  | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|----------------|-------|--------|--------|--------|-------------|-----------|------|---------|
| <b>PRIMARY</b> | BTREE | Yes    | No     | ddu_id | 528         | A         | No   |         |
| <b>cr_id</b>   | BTREE | No     | No     | cr_id  | 14          | A         | Yes  |         |
| <b>cc_id</b>   | BTREE | No     | No     | cc_id  | 33          | A         | No   |         |

Figure 14: "ddu" table format, to keep track user who download and which data had been downloaded.

4.2 - **Boolean searches:** <http://www.wovodat.org/boolean/booleanIndex.php>

By selecting time period and selected data type, user will be directed to data visualization (single volcano view) or data download link.

**WOVODat** Data on Volcanic Unrest

Home News Visualization Data Download Submit Data Documentation Contact Us LOGIN WOVODat Tools Index

### WOVODat Boolean Search Form

FIND ANALOGOUS VOLCANOES >

FIND ANALOGOUS ERUPTIONS >

FIND ANALOGOUS MONITORING DATA >

|  |   |  |
|--|---|--|
| <b>Seismic</b><br><input type="checkbox"/> Network Events<br><input type="checkbox"/> Single Station Events<br><input type="checkbox"/> Seismic Intensity<br><input type="checkbox"/> Interval (Swarms)<br><input type="checkbox"/> Tremor<br><input type="checkbox"/> RSAM<br><input type="checkbox"/> SSAM | <b>Deformation</b><br><input type="checkbox"/> Angle<br><input type="checkbox"/> EDM<br><input type="checkbox"/> GPS<br><input type="checkbox"/> GPS vector<br><input type="checkbox"/> Levelling<br><input type="checkbox"/> Strain<br><input type="checkbox"/> TR<br><input type="checkbox"/> TR vector | <b>Field</b><br><input type="checkbox"/> Electricity (SP)<br><input type="checkbox"/> Gravity<br><input type="checkbox"/> Magnetic Fields<br><input type="checkbox"/> Magnetic Vector<br><b>Gas</b><br><input type="checkbox"/> Sampled Gas<br><input checked="" type="checkbox"/> Plume<br><input type="checkbox"/> Soil Efflux |
| <b>Hydrologic</b><br><input type="checkbox"/> Water chemistry  | <b>Thermal</b><br><input type="checkbox"/> Thermal Data   | <b>Meteo</b><br><input type="checkbox"/> Meteo Data  |

USE ADVANCED SEARCH TO SPECIFY THRESHOLDS OR RANGES OF VALUES OF INTEREST +

For between operator, enter range with format: MIN, MAX (For example: 1000, 2000)

#### Gas Plume

Period of Interest Start: \_\_\_\_\_ End: \_\_\_\_\_

Plume Height (km): Choose y/n \_\_\_\_\_

Gas Rate: Emission Apply Threshold without species ▼  
Choose y/n \_\_\_\_\_

Gas Mass: Emission Apply Threshold without species ▼  
Choose y/n \_\_\_\_\_

Total Emission: Gas Apply Threshold without species ▼  
Choose y/n \_\_\_\_\_

SEARCH CLEAR ALL FIELDS

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Figure 15: Boolean search form



# WVOdat Data on Volcanic Unrest

[Home](#) [News](#) [Visualization](#) [Data Download](#) [Submit Data](#) [Documentation](#) [Contact Us](#) [LOGIN](#) [WVOdat Tools Index](#)

Home > Data Download > WVOdat Boolean Search Form

Data Search Results: 28

| Volcano Name | Vol Feature     | Vol Rock Types                 | Monitoring Data Type                  | Monitoring Start Time | Monitoring End Time | Visualization                 | Preview/Download                 |
|--------------|-----------------|--------------------------------|---------------------------------------|-----------------------|---------------------|-------------------------------|----------------------------------|
| Asama        | Complex volcano | Andesite/Basaltic Andesite     | Plume from ground based station (SO2) | 2002-07-04 05:00:00   | 2012-03-14 05:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Augustine    | Lava dome       | Unknown                        | Plume from Satellite (SO2)            | 1991-06-13 12:00:00   | 2008-07-17 12:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Colima       | Stratovolcano   | Andesite/Basaltic Andesite     | Plume from Satellite (SO2)            | 1991-04-30 00:00:00   | 2004-10-18 00:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Colima       | Stratovolcano   | Andesite/Basaltic Andesite     | Plume from ground based station (SO2) | 1994-07-16 00:00:00   | 2007-02-13 00:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Douglas      | Stratovolcano   | Unknown                        | Plume from Satellite (SO2)            | 2000-08-10 12:00:00   | 2002-07-01 12:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Etna         | Stratovolcano   | Trachybasalt/Tephrite Basanite | Plume from ground based station (SO2) | 1977-07-25 00:00:00   | 1999-03-29 00:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Fourpeaked   | Stratovolcano   | Unknown                        | Plume from Satellite (CO2)            | 2006-09-23 12:00:00   | 2007-05-18 12:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Griggs       | Stratovolcano   | Unknown                        | Plume from Satellite (SO2)            | 2002-07-01 12:00:00   | 2002-07-01 12:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Iliamna      | Stratovolcano   | Unknown                        | Plume from Satellite (SO2)            | 1990-03-20 00:00:00   | 2005-05-10 12:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Kilauea      | Shield volcano  | Basalt/Picro-Basalt            | Plume from Satellite (SO2)            | 2005-01-01 02:06:00   | 2005-01-10 00:57:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Kilauea      | Shield volcano  | Basalt/Picro-Basalt            | Plume from ground based station (SO2) | 1979-06-10 00:00:00   | 2010-12-30 20:33:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Mageik       | Stratovolcano   | Unknown                        | Plume from Satellite (SO2)            | 2004-08-07 12:00:00   | 2004-08-07 12:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Martin       | Stratovolcano   | Dacite                         | Plume from Satellite (SO2)            | 1998-05-24 12:00:00   | 2006-09-24 12:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |
| Mayon        | Stratovolcano   | Andesite/Basaltic Andesite     | Plume from ground based station (SO2) | 2000-01-05 15:37:00   | 2012-11-01 00:00:00 | <a href="#">Visualization</a> | <a href="#">Preview/Download</a> |

Figure 16: Boolean search results

5. **Submit Data:** [http://www.wovodat.org/populate/home\\_populate.php](http://www.wovodat.org/populate/home_populate.php)



# WVOdat

## Data on Volcanic Unrest

Home
News
Visualization
Data Download
Submit Data
Documentation
Contact Us
Account
WVOdat Tools Index

### Submit Data

For now, the database only accepts data in [WVOdat-XML \(WVOOml\)](#) format. Short explanation on how to submit data into WVOdat is available here ([pdf](#)).

We offer 3 options for contributors to submit data:

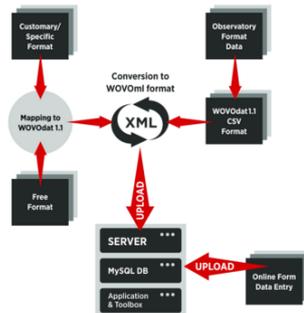
- **Submission of original observatory data format.**  
Send a file of any format to WVOdat; and let the WVOdat team convert and upload it to the database.
- **Submission of spreadsheet (comma-separated values CSV) file.<2Mb):**  
Send comma-separated values CSV file in WVOdat1.1 standard/compliant format; find csv template files here ([zip](#)). Please refer to [WVOdat1.1 documentations for detail information on data format](#).  
  - (a) **CSV of monitoring system:**  
network, station, instrument, airplane, satellite
  - (b) **CSV of data:**  
seismic, deformation, gas, hydrology, fields, thermal, meteo
  - (c) **CSV of customary format data**  
Send comma-separated values CSV file in customary format; known/registered by and WVOdat:
  - (d) **Csv of Eruption data:**  
and eruption, eruption phase, eruption forecast, eruption video

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 WVOOml file**  
Upload of WVOOml format file to MySQL database

**Checking Tools:**

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



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Figure 17: WVOdat online UI for data submission (data conversion and upload)

For now, the database only accepts data in [WOVOdat-XML \(WOVOml\)](#) format. A short explanation on how to submit data into WOVOdat is available here [\(pdf\)](#).

We offer different options for contributors to submit data:

### **ONLINE DATA CONVERSION**

Online data conversion allows the user to convert their observatory data from comma-separated values (CSV) into standardized WOVOdat-XML format (WOVOml).

1. [Submission of original observatory data format.](#)  
Send metadata/information and monitoring data file of any format to WOVOdat; and let the WOVOdat team convert and upload it to the database.
2. Submission of spreadsheet CSV file.(<2Mb):  
Send comma-separated values CSV file in WOVOdat1.1 standard/compliant format. CSV template for each table can be downloaded here [\(zip\)](#). Please refer to [WOVOdat1.1](#) document for detailed information on data format.  
**(a) [CSV of monitoring system:](#)**  
Metadata/information concerning monitoring network, station, instrumentation, component, airplane/satellite  
  
**(b) [CSV of data:](#)**  
Monitoring data: Seismic, deformation, gas, hydrology, fields, thermal, and meteorology.

### **Customary online conversion**

Send comma-separated values CSV file in standard observatory format (specifically for known/registered format by WOVOdat):

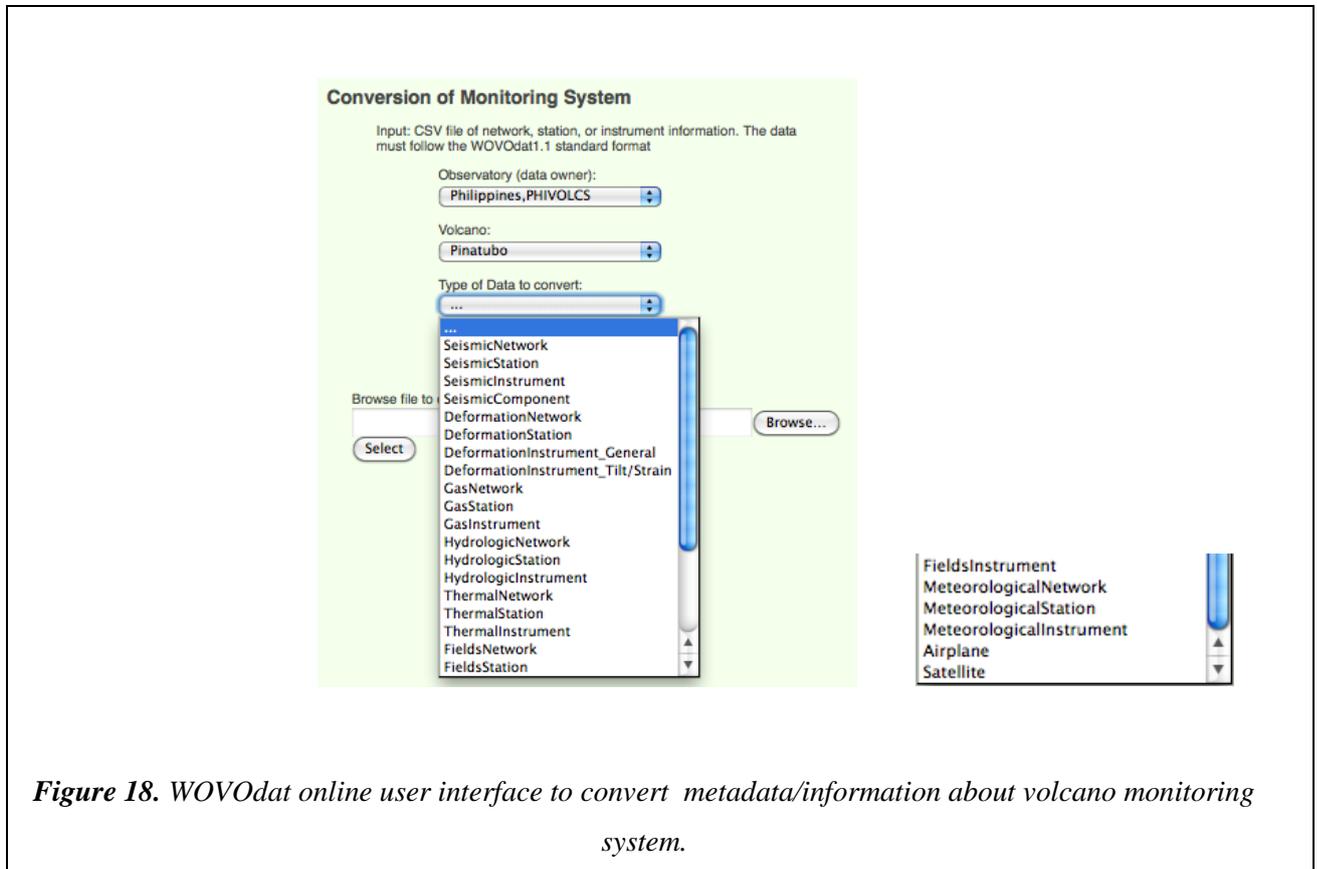
- (c) [CSV of customary format data](#)

### **DATA UPLOAD** *(This option only appears for the admin or developer team only):*

1. Input data using online form:  
  
Submission of small amount of data through [online forms](#). Including bibliographic, inferred processes, volcano, observation about volcanic activity, observatory contact information.
2. [Upload WOVOml file](#)  
After successfully converting their csv file to XML format, the user will be able to upload their WOVOml format file to the MySQL database.
3. **Submitting data through online conversion**  
**(a) Monitoring system**  
  
User will be required to submit their volcano monitoring metadata/information prior submitting their monitoring data into WOVOdat database. WOVOdat divides

volcano monitoring into 7 different groups: Seismic, deformation, gas, hydrology, fields, thermal, and meteorology.

Following hierarchical schema of WOVOdat, the user will first submit *network* => then follow by *station* => *instrument*.



*Figure 18. WOVOdat online user interface to convert metadata/information about volcano monitoring system.*

## (b) Monitoring data

Various types of monitoring data currently managed in the WOVOdat database are:

- **Seismic:** Event recorded by network, event recorded by single station, tremor, intensity, interval/swarm (earthquake count, seismic energy), waveform example, RSAM, and SSAM.
- **Deformation:** Tilt (radial-displacement and vector), strain, electronic distance measurement (EDM), angle, GPS (displacement and vector), leveling, and InSAR.
- **Fields:** Electric fields, gravity, magnetic (fields and vector)
- **Gas:** Directly sampled gas, plume, soil efflux.
- **Hydrologic:** Hydrologic measurement (physical and chemical component)
- **Thermal:** Ground based and remote thermal measurement
- **Meteorological data**

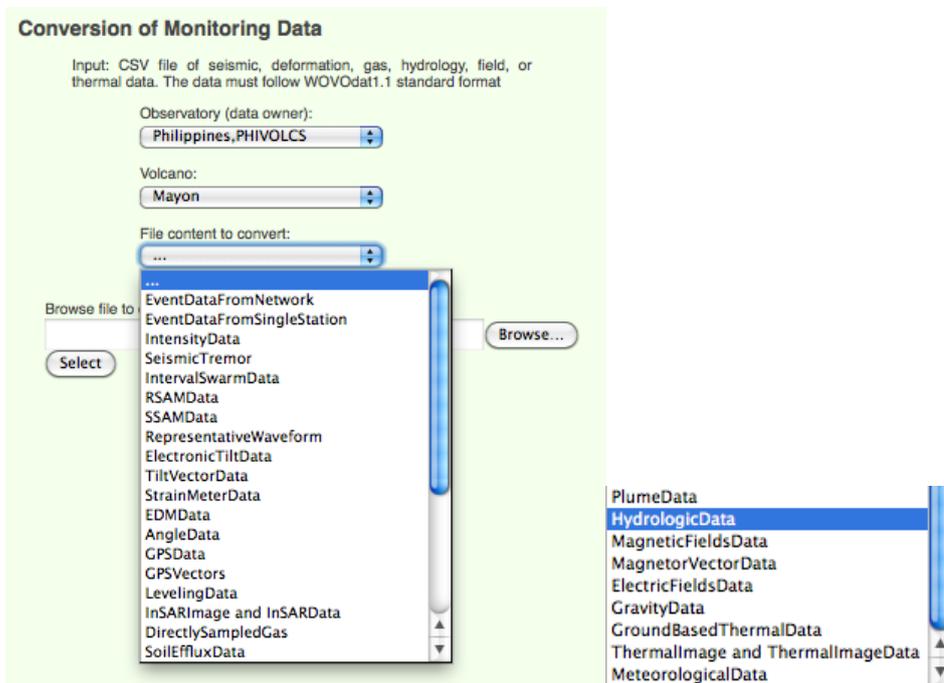


Figure 19. WOVodat online user interface to convert various type of volcano monitoring data.

(c) Customary format data

This part is an automatic online conversion, intended for specific data format from observatory/partner, where the data format has already been mapped and known by WOVodat system.

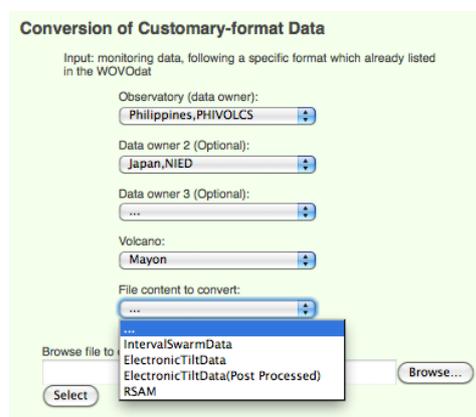


Figure 20. Example of customary automatic conversion for PHIVOLCS data format.

### 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:    
Browse Tangential or T-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

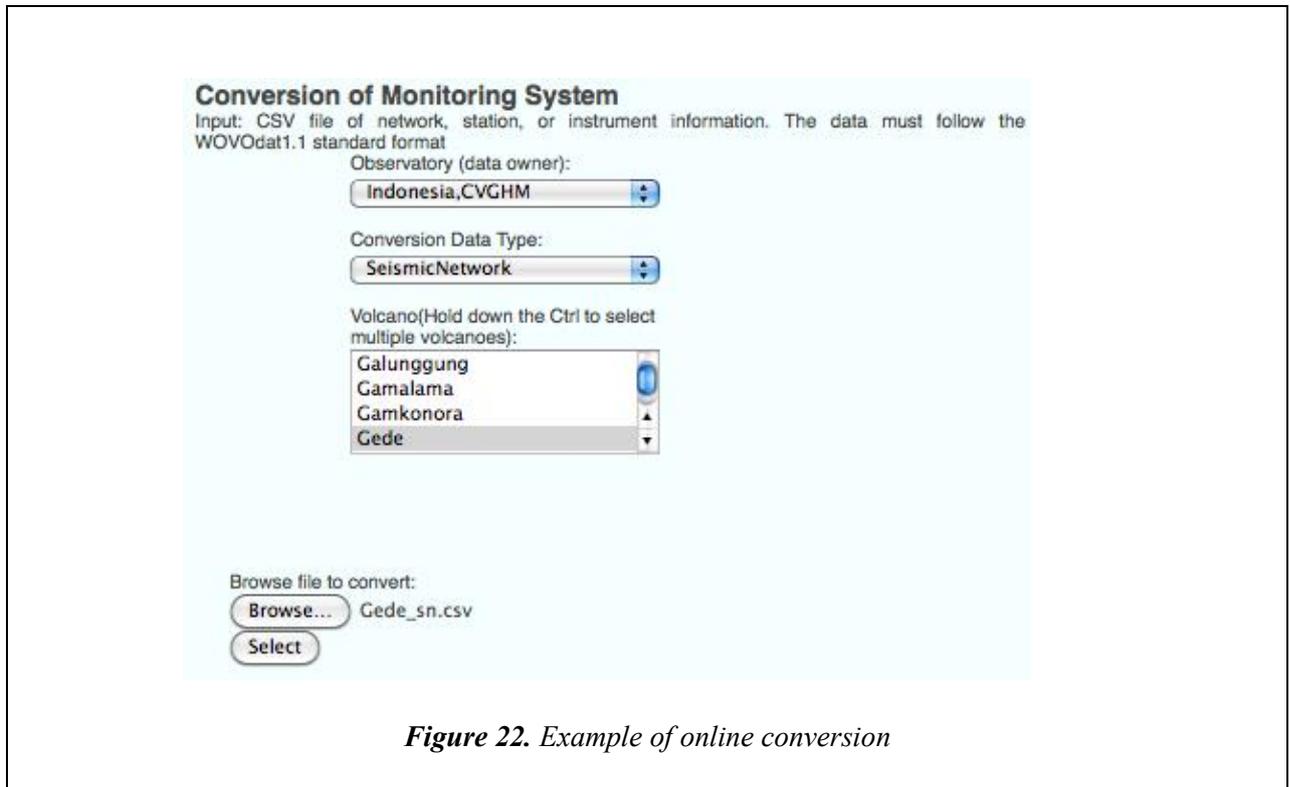
Please Enter RSAMSSAM Code here:

Browse file to convert:

Figure 21. Example of customary automatic conversion for PHIVOLCS data format (cont.).

**Example of conversion processes:** *Conversion of seismic-monitoring system*

A. Conversion of seismic network CSV to XML format. Through online submission, the user inputs/uploads a CSV file (*following WOVodat standard format*).



*Figure 22. Example of online conversion*

Below is an example of the seismic network (sn) table, following the WOVodat CSV template.

| sn_id | sn_code          | vd_id | sn_name              | sn_vmodel  | sn_vmodel_detail   |
|-------|------------------|-------|----------------------|--|--|
|       | Gede_Seismic_Net |       | Gede Seismic Network | Regional Velocity Model (... and others, 1993). Layer number Vp (km/sec) Top of layer (km) Vp/Vs<br>1 5.3 -3.0 1.78<br>2 5.6 4.0 1.78<br>3 6.2 10.0 1.78<br>4 6.9 15.0 1.78<br>5 7.4 20.0 1.78<br>6 7.7 35.0 1.78<br>7 7.9 33.0 1.78<br>8 8.1 47.0 1.78<br>9 8.3 65.0 1.78 | /home/wovodat/public_html/WOVodat/region/06/03/waveform/vmodel.txt |

| sn_zerokm               | sn_fdepth_flag | sn_fdepth                 | sn_stime            | sn_stime_unc | sn_etime | sn_etime_unc | sn_tot |
|-------------------------|----------------|---------------------------|---------------------|--------------|----------|--------------|--------|
| 0 elevation (sea level) | U              | Unknown if depth is fixed | 1980-08-01 06:00:00 | NULL         | NULL     | NULL         | 10     |

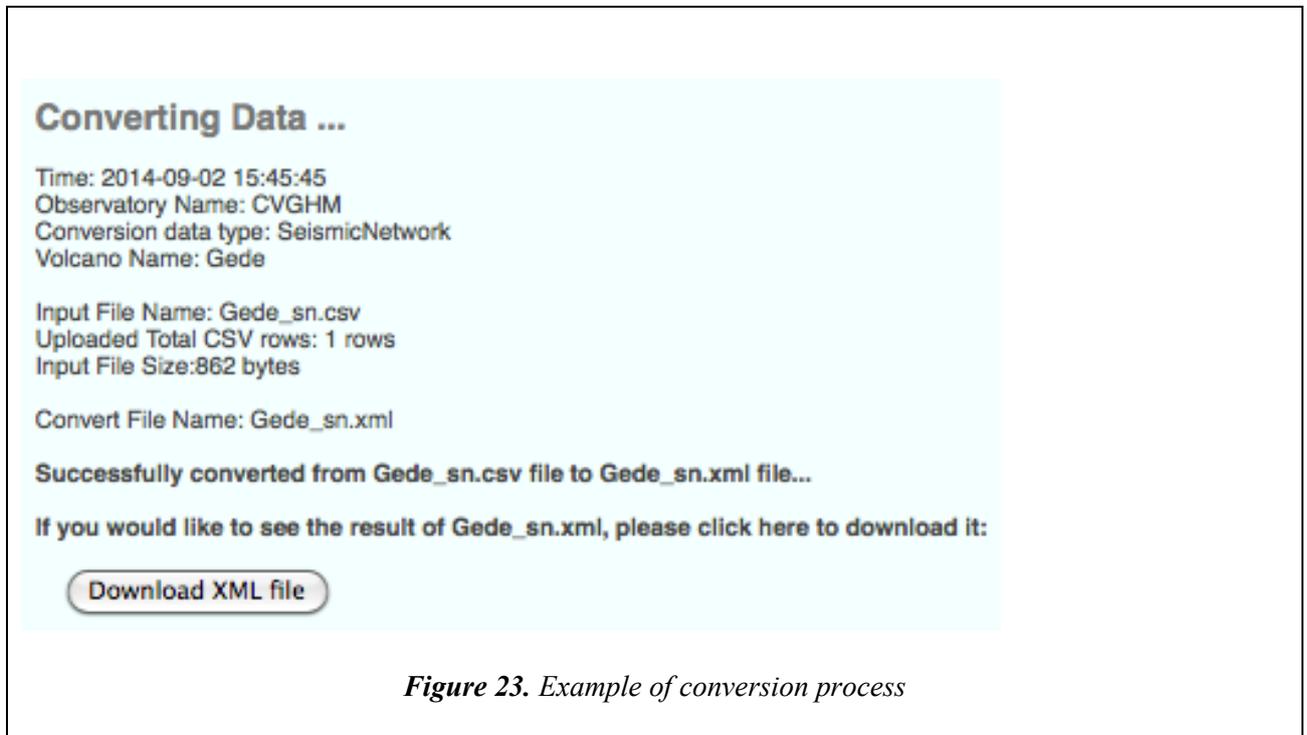
| sn_bb | sn_smp | sn_digital | sn_analog | sn_tcomp | sn_micro | sn_desc                                   | sn_utc |
|-------|--------|------------|-----------|----------|----------|---|--------|
| 5     | 5      | 10         | 0         | 7        | 0        | Gede seismic monitoring system from CVGHM | 7      |

| sn_ori | sn_com      | cc_id | cc_id2 | cc_id3 | sn_loaddate | sn_pubdate          | cc_id_load | cb_ids |
|--------|-------------|-------|--------|--------|-------------|---------------------|------------|--------|
| 0      | DUMMY DATA. | NULL  | NULL   | NULL   | NULL        | 1992-08-17 06:00:00 | NULL       | NULL   |

Note:

- sn\_id is primary key index for this table
- Red colored fields: vd\_id, cc\_id, and cb\_ids are foreign key index, which link to another tables (in this case: vd, ss, and cb table).
- The fields highlighted in grey are left blank, since it will be assigned automatically by the system or filled by the web-form.
- Standard WOVOdat datetime is YYYY-MM-DD hh:mm:ss (preffered in UTC)
- Please see WOVOdat User manual (<http://www.wovodat.org/doc/database/1.1/index.php>) for more detailed information about the table format.

Converting CSV to WOVOMl format:



User will be able to retrieve the XML file, as conversion output. Below is an example of XML format for Gede seismic network (dummy data).

```
<?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>
  <SeismicNetwork code="Gede_Seismic_Net" owner1="CVGHM" pubDate="1992-08-17 06:00:00">
    <Volcanoes>
      <volcanoCode>0603-06=</volcanoCode>
    </Volcanoes>
  </SeismicNetwork>
</MonitoringSystems>
```

```

<name>Gede Seismic Network</name>
<velocityModel>Regional Velocity Model (... and others, 1993).
  Layer number Vp (km/sec) Top of layer (km) Vp/Vs
  1 5.3 -3.0 1.78
  2 5.6 4.0 1.78
  3 6.2 10.0 1.78
  4 6.9 15.0 1.78
  5 7.4 20.0 1.78
  6 7.7 35.0 1.78
  7 7.9 33.0 1.78
  8 8.1 47.0 1.78
  9 8.3 65.0 1.78</velocityModel>

```

```

<velocityModelDetail>/home/wovodat/public_html/WOVOdat/region/06/03/waveform/vmodel.txt</velocityModelDetail

```

>

```

<zeroDepth>0 elevation (sea level)</zeroDepth>
<fixedDepth>U</fixedDepth>
<fixedDepthDesc>Unknown if depth is fixed</fixedDepthDesc>
<startTime>1980-01-17 06:00:00</startTime>
<numberOfSeismo>10</numberOfSeismo>
<numberOfBBSeismo>5</numberOfBBSeismo>
<numberOfSMPSeismo>5</numberOfSMPSeismo>
<numberOfDigiSeismo>10</numberOfDigiSeismo>
<numberOfAnaSeismo>0</numberOfAnaSeismo>
<numberOf3CompSeismo>7</numberOf3CompSeismo>
<numberOfMicro>0</numberOfMicro>
<description>Gede seismic monitoring system from CVGHM </description>
<diffUTC>7</diffUTC>
<orgDigitize>O</orgDigitize>
<comments>DUMMY DATA.</comments>

```

```

</SeismicNetwork>

```

```

</MonitoringSystems>

```

```

</wovoml>

```

## B. Upload XML file to the MySQL database.

**SUBMIT DATA**  
For now, the database only accepts data in [WOVOdat-XML \(WOVOml\)](#) format. Short explanation on how to submit data into WOVODat is available here ([pdf](#)).

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; find csv template files here ([zip](#)). Please refer to [WOVODat1.1](#) documentations for detail information on data format.
  - (a) [CSV of monitoring system:](#)  
network, station, instrument, airplane, satellite
  - (b) [CSV of data:](#)  
seismic, deformation, gas, hydrology, fields, thermal, meteo
Send 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](#)

**Data issued from:**  Geological Agency of Indonesia (2011). Data Dasar Gunung Api Indonesia  No

**From another publication?**  Yes  No

Select file to upload:  
WOVOML file :  Gede\_sn.xml

**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 network: 1 object

Cancel  
 Confirm

---

**Upload successful**  
 Thank you for your contribution to WOVodat.  
 File Gede\_sn.xml was processed successfully.  
 You may now go back to the home page for any other operation.

*Figure 24. Example of data uploading process*

**Data is stored in the database.**

Showing rows 66 - 66 ( 67 total, Query took 0.0005 sec)

```
SELECT *
FROM "sn"
LIMIT 66 - 1
```

Profiling [Inline] [ Edit ] [ Explain SQL ] [ Create PHP Code ] [ Refresh ]

Sort by key: None

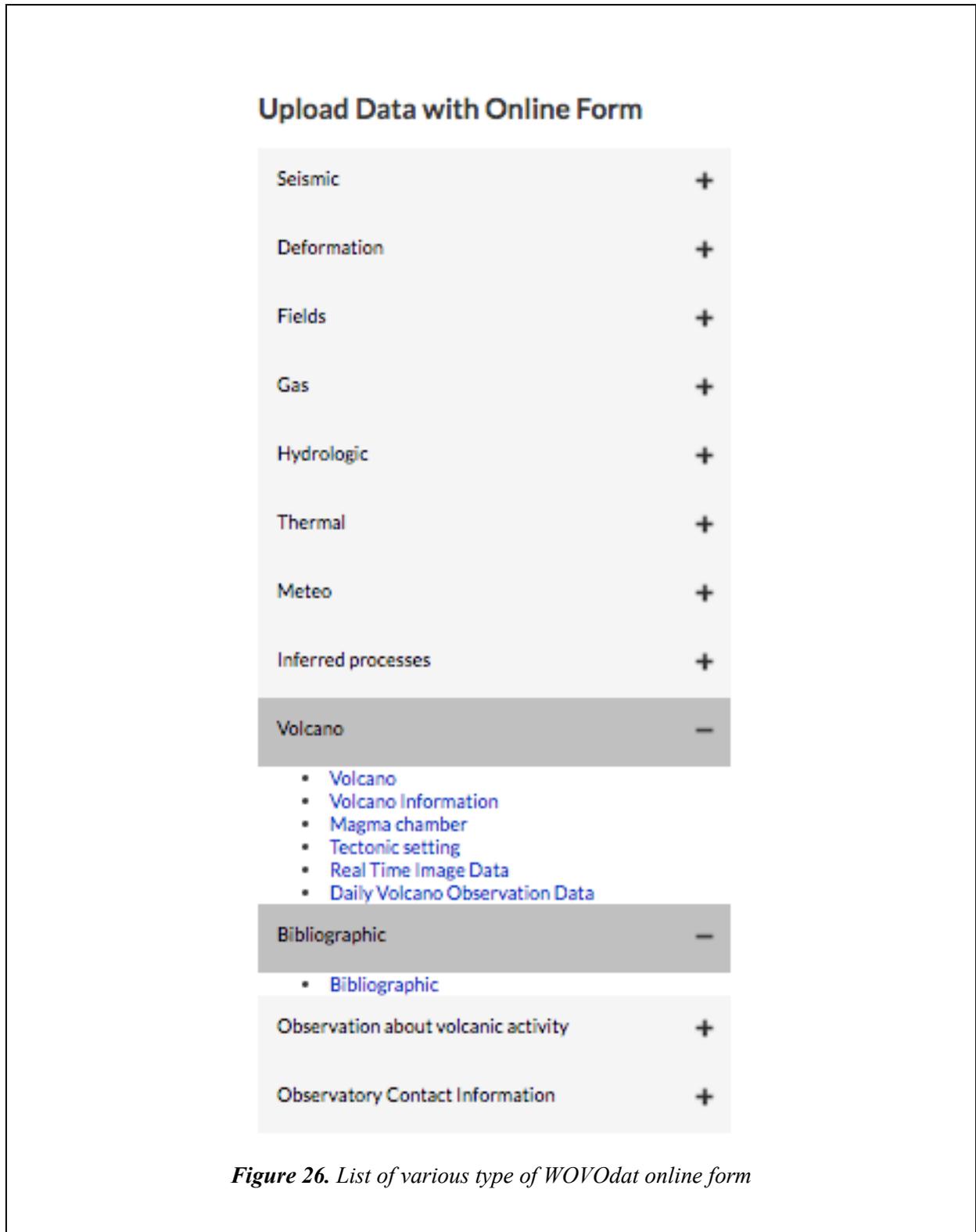
| sn_id | sn_code          | vd_id      | sn_name              | sn_vmodel   | sn_vmodel_detail  | sn_zerokm               | sn_fdepth_flag                | sn_fdepth                 | sn_stime            | sn_stime_unc           | sn_etime            | sn_etime_u           |
|-------|------------------|------------|----------------------|---|---|-------------------------|-------------------------------|---------------------------|---------------------|------------------------|---------------------|----------------------|
| ID    | Code             | Volcano ID | Name                 | Description of velocity model                         | Link to a file containing additional details about velocity model | Elevation of zero km    | A flag whether depth is fixed |                           | Start date          | Start date uncertainty | End date            | End date uncertainty |
| 131   | Gede_Seismic_Net | 444        | Gede Seismic Network | Regional Velocity Model (... and others, 1993). La... | /home/wovodat/public_html/WOVodat/region/06/03/wav...             | 0 elevation (sea level) | U                             | Unknown if depth is fixed | 1980-01-17 06:00:00 | NULL                   | 9999-12-31 23:59:59 | NU                   |

Query results operations  
 Print view | Print view (with full texts) | Export | Display chart | Create view

*Figure 25. Data successfully input into MySQL database*

After successfully input monitoring system metadata (network, station information, and instrument information), user will be able to input data.

**Submitting data through online form:**



*Figure 26. List of various type of WOVOdat online form*

=> Bibliography table:

**WOVodat** Data on Volcanic Unrest

Home News Visualization Data Download Submit Data Documentation Contact Us Account **WOVodat Tools Index**

Home > Submit Data > Online Form

### Upload online form for Bibliographic Information (Table Name: cb)

(All fields \* are required)

\*Authors/Editors:

\*Publication year (YYYY):

\*Paper Title:

Journal Name:

Journal Volume:

Publisher Name:

Page Numbers:

Digital Object Identifier:

International Standard Book Number (ISBN):

Web Address (URL):

Email address of observatory or laboratory:

Keywords (Please separate each group of keywords with a comma):

Comments:

[Back to previous page](#)

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**Data Policy**  
**Contact Us**

**Contributors:**  
Smithsonian GVP, JMA, NIED, USGS-VDAP, GNS, UNAVCO, PHIVOLCS, CVGHM, and Other WOVO Observatories

*Figure 27. WOVodat online form for Bibliography*

=> Volcano Information:

**WOVodat** Data on Volcanic Unrest

Home News Visualization Data Download Submit Data Documentation Contact Us Account **WOVodat Tools Index**

Home > Submit Data > Online Form

**Upload online form for Volcano Information (Table Name: vd)**  
(All fields \* are required)

\*Volcano Name:

Volcano Second Name:

\*Volcano CAVW:

\*Volcano Number:

Volcano Time Zone:

Multiple contacts for this volcano:

Comment:

\*Institution/Observatory:

Second Institution/Observatory:

Third Institution/Observatory:

Fourth Institution/Observatory:

Fifth Institution/Observatory:

Publish Date:

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EARTH OBSERVATORY OF SINGAPORE

**Figure 28:** WOVodat online form for Volcano Information

6. Documents: <http://www.wovodat.org/doc/>

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

**WOVODat** Data on Volcanic Unrest

Home News Visualization Data Download Submit Data Documentation Contact Us LOGIN WOVODat Tools Index

Home > Documentation

### Documentation

WOVODat Database uses formats and data structure as described in [WOVODat1.0 \(Venezky and Newhall, 2007\)](#). The current version is WOVODat1.1. The overall structure was retained from v1.0 to v1.1; most changes are in the details of parameters.

We use MySQL database system, and convert all submitted data into xml-format (WOVOMl).

#### User Manual

- WOVODat database Documentation/ Manual WOVODat1.1 Manual ([pdf](#))
- Detail description of WOVODat Tables WOVODat1.1 Tables ([online view](#))
- Introduction how to use WOVODat Introduction to using WOVODat ([pdf](#))

#### Database schema and structure

- WOVODat Schema xsd WOVOMl1.1.0 Schema ([online view](#))
- WOVODat structure in XML format and their related MySQL's attributes WOVODat XML ([online view](#))

#### Download WOVODat Standalone Package

For those from observatories willing to develop their database system using **WOVODat-like** format, scripts are available [here](#). These are basic scripts that could be used in starting database construction.

**Sys-admin/Developer Team**

XML Conversion to WOVOMl format

SERVER MySQL DB Application & Toolbox

OUTPUT Visualization QUERY web-based GUI

USERS

SUBMIT DATA

UPLOAD

New Formats WOVODat 1.1 CSV Format Known CSV Format Online Forms

Details of data flow. From observatories submitting various data formats, through XML conversions with standardized terms, then upload and store into WOVODat server.

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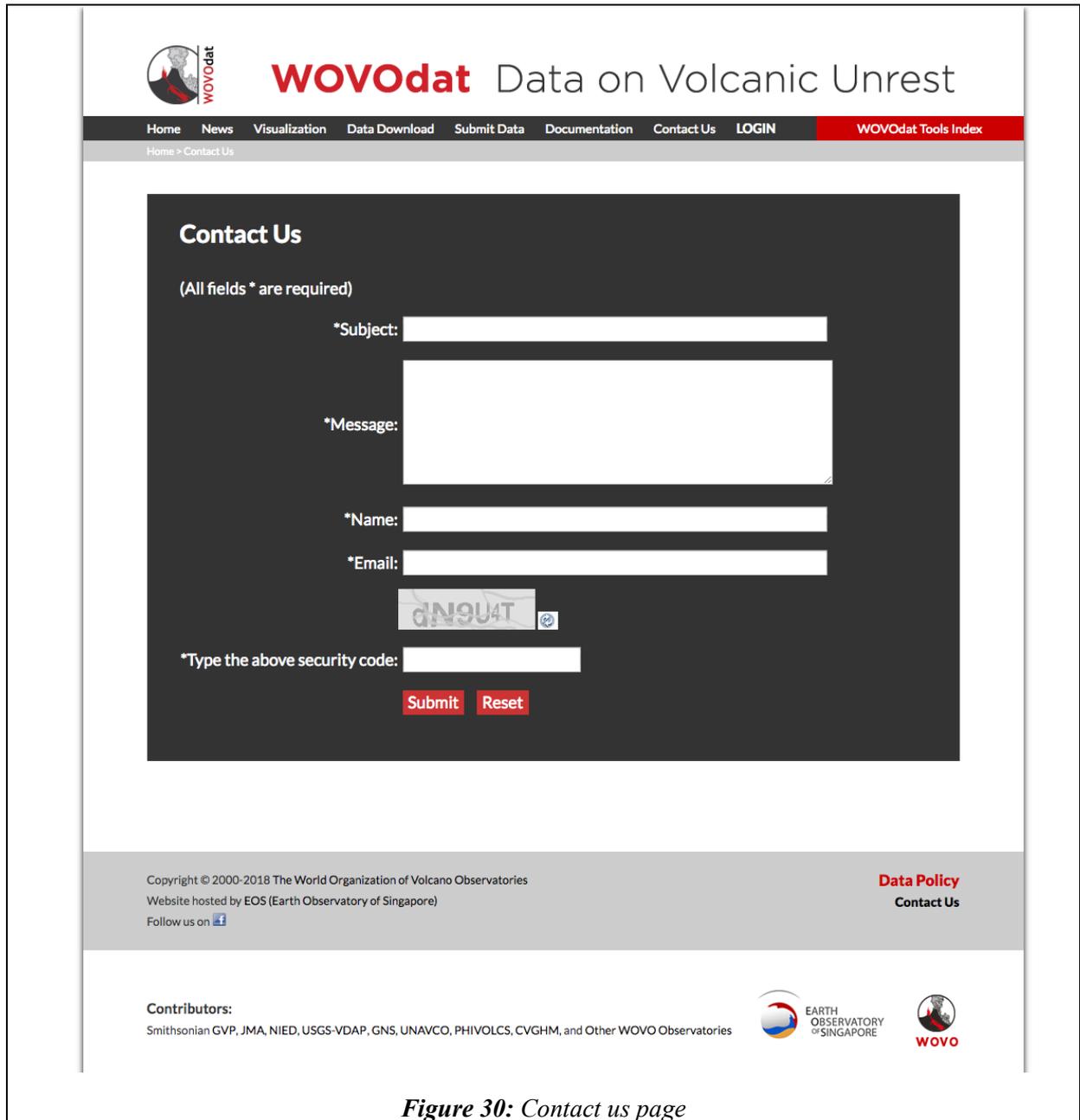
EARTH OBSERVATORY OF SINGAPORE WOVO

Figure 29: WOVODat documents available for online or download through our website.

7. **Contact Us:** [http://www.wovodat.org/populate/contact\\_us\\_form.php](http://www.wovodat.org/populate/contact_us_form.php)

The more data in WOVodat, the more useful it will be. 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 and other utilities.

Contact us via email: WOVodat developer team ([wovodat@wovodat.org](mailto:wovodat@wovodat.org))



*Figure 30: Contact us page*