

WOVOdat 1.1

User Manual

By:

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Introduction

WOVOdat is the World Organization of Volcano Observatories' (WOVO) Database of Volcanic Unrest; instrumentally and visually recorded changes in seismicity, ground deformation, gas emission, and other parameters from their normal baselines. The database is created per the structure and format as described in the WOVOdat 1.0 report of Venezky and Newhall (USGS Openfile report 2007-1117), updated in this WOVOdat 1.1 User Manual.

Volcanoes are frequently restless but only a fraction of unrest leads to eruptions. Uncertainties in interpretation of volcanic unrest are unacceptably high. WOVOdat will capture historical volcanic unrest and make it freely web-accessible, for reference during volcanic crises and for basic research on preeruption processes.

- WOVOdat will be to volcanology as epidemiological databases are to medicine — valuable tools for research and crisis response -

We are importing historical, parametric data from the current myriad of data formats, database architectures, servers and storage media, into a single, comprehensive relational database with standardized formats.

Our website (www.wovodat.org) supports interaction between WOVOdat developers, observatories, and other partners in building the database, e.g. accessing schematic design information and documentation, and utilities for submitting data. The on-line documentation helps users from volcano observatories to understand the structure and data formats of WOVOdat.

Why using MySQL?

WOVOdat choose a relational database for storing and accessing the large amounts of data of volcanic unrest. A relational database is a collection of tables that are related by common fields.

MySQL is an Open Source database, using Structured Query Language (SQL) which capable on handling relational database and also able to integrate with common web languages.

For further information about relational database terminology and concepts, we suggest users to consult online references about relational database concept.

What is WOVOML?

Data inside WOVOdat are stored in a MySQL database, where data tables organized and formatted following the WOVOdat 1.0/1.1 structure (Venezky and Newhall, 2007).

There are several ways to input data into WOVOdat database:

- Manual input under MySQL server (not practical when we have many data to feed in)
- Generate an XML format file which is compatible with WOVOdat SQL structure.
WOVOML was therefore created as WOVOdat standard reference XML format file, to facilitate data inputting/importing into the database.

Detail information/documentation about WOVOdat data handling and formatting can be found at www.wovodat.org/doc/

Various scripts/tools to convert different data format into WOVOML will be made available online, so that the user able to import their data into WOVOdat database interactively.

Use of WOVOdat

WOVOdat will enable searches and comparisons of processed monitoring data, e.g., earthquake hypocenters, geodetic displacements, and gas fluxes from different episodes of unrest from a single volcano, or from unrest of different but analogous volcanoes.

Reference to analogues is especially needed during crises at volcanoes with no historical record or insufficient monitoring data of their own.

If unrest with character X,Y,Z is observed, the user can find other occurrences of similar unrest, and details of any resulting eruptions. Or, one might look for systematic of unrest at analogous volcanoes, selected on the basis of geologic or petrologic similarities.

When the database is sufficiently complete, tools will be made available for users to perform searches and comparisons interactively through our website. Tools for pattern recognition, eruption probability estimation, and other purposes are also planned.

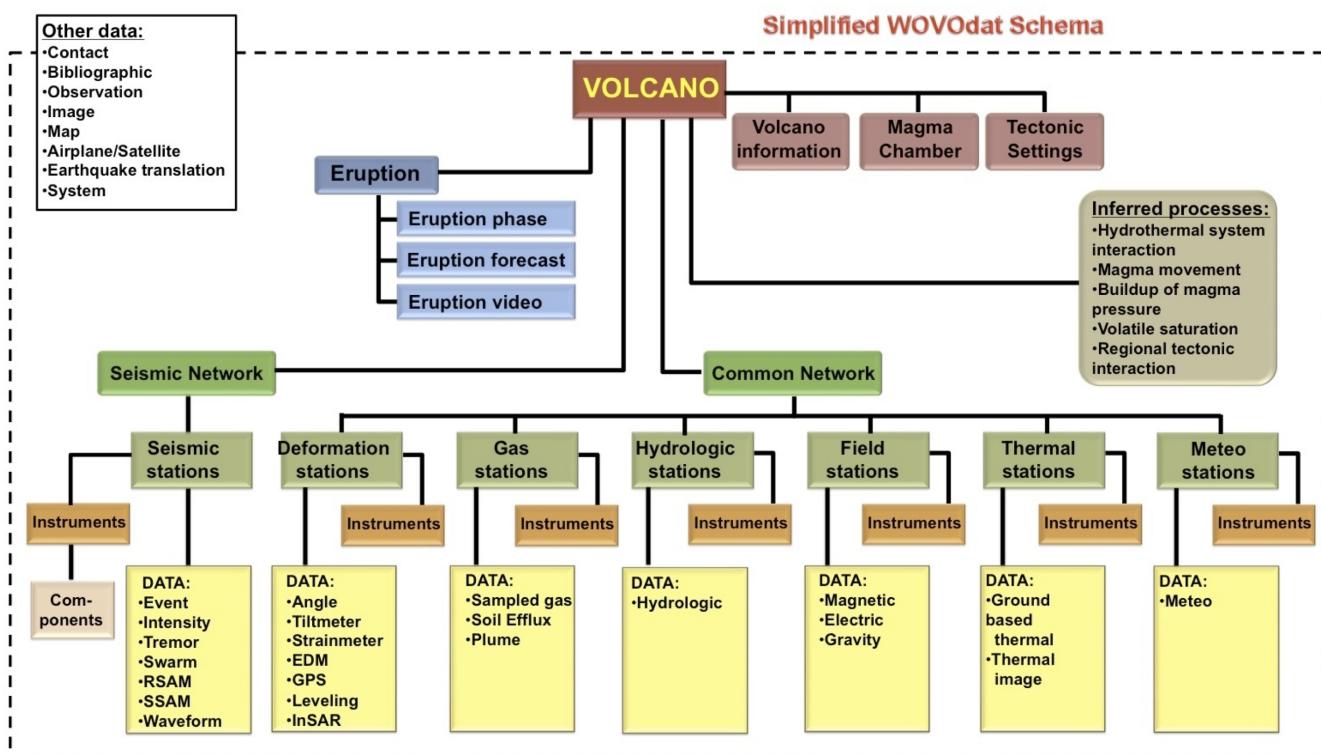


Figure 1. Type of data stored in the WOVOdat database

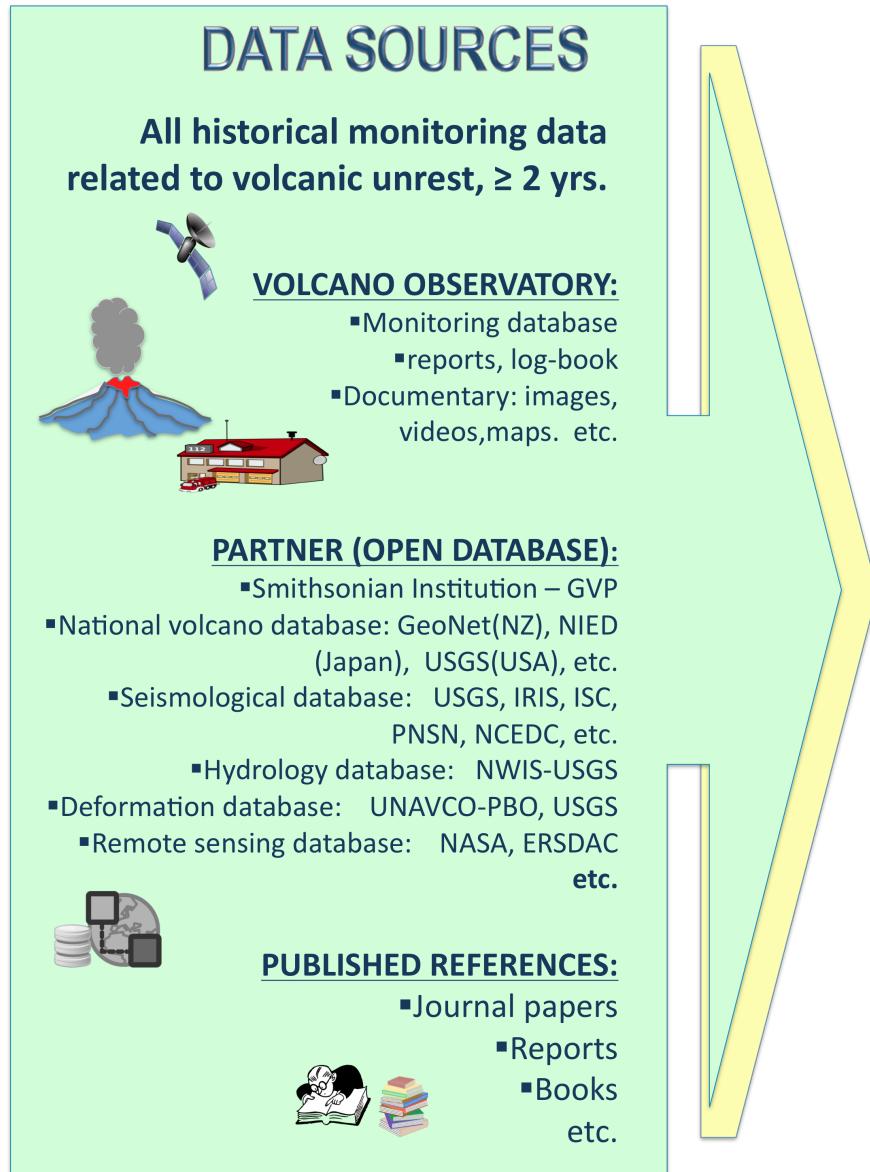


Figure 2. Type of data sources

WOVOdat Data Flow

Submitting Data

WOVOdat system uses xml format for its input data file. Any other data format would be converted into xml prior uploaded into the database. Once the original format is recognized, a build in script will be able to convert data into XML format to be then uploaded into MySQL database.

As anticipation of various data formats coming from different observatories, we provide interactive tools for users to submit data in any of three different ways. The data will be converted into WOVOdat XML common formats (WOVOMl), uploaded and stored in the database system.

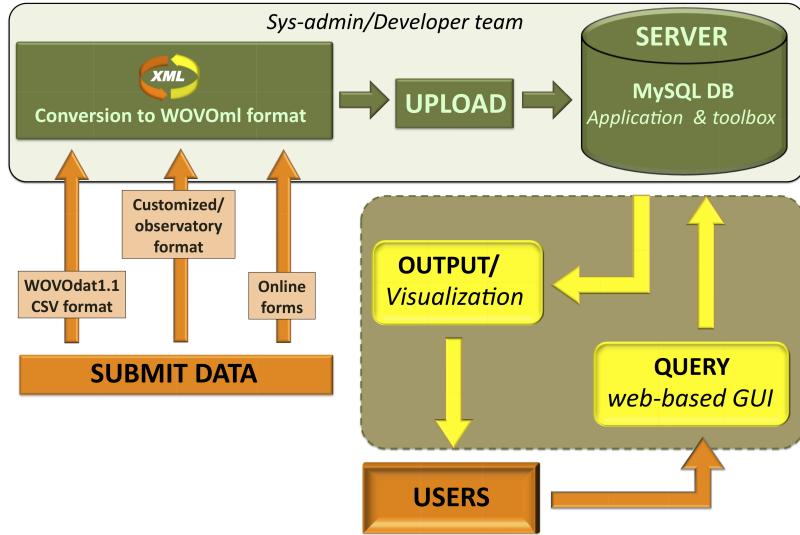


Figure 3. WOVOdat data flow

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.

Figure 4. Interactive online GUI for data submission

The main users for WOVOdat will be observatory and other scientists seeking comparisons and analogues for their own volcanic unrest, or looking for systematics in pre-eruption behavior. We anticipate significant student use as well.

We are now in the phase of data population. The objective is to include all recorded historical unrest, including but not limited to that which led to eruption. From all reliable sources, including volcano observatories, published materials, and open and partner databases, data are stored in the WOVOdat system. **Ownership of the data remains with the data contributors.**

Output and visualization tools

Various visualization tools will help users to query and view the data. 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.

WOVOdat invites those who wish to contribute visualization and other utilities to do so. Some of these may have already been developed for other personal or observatory uses.

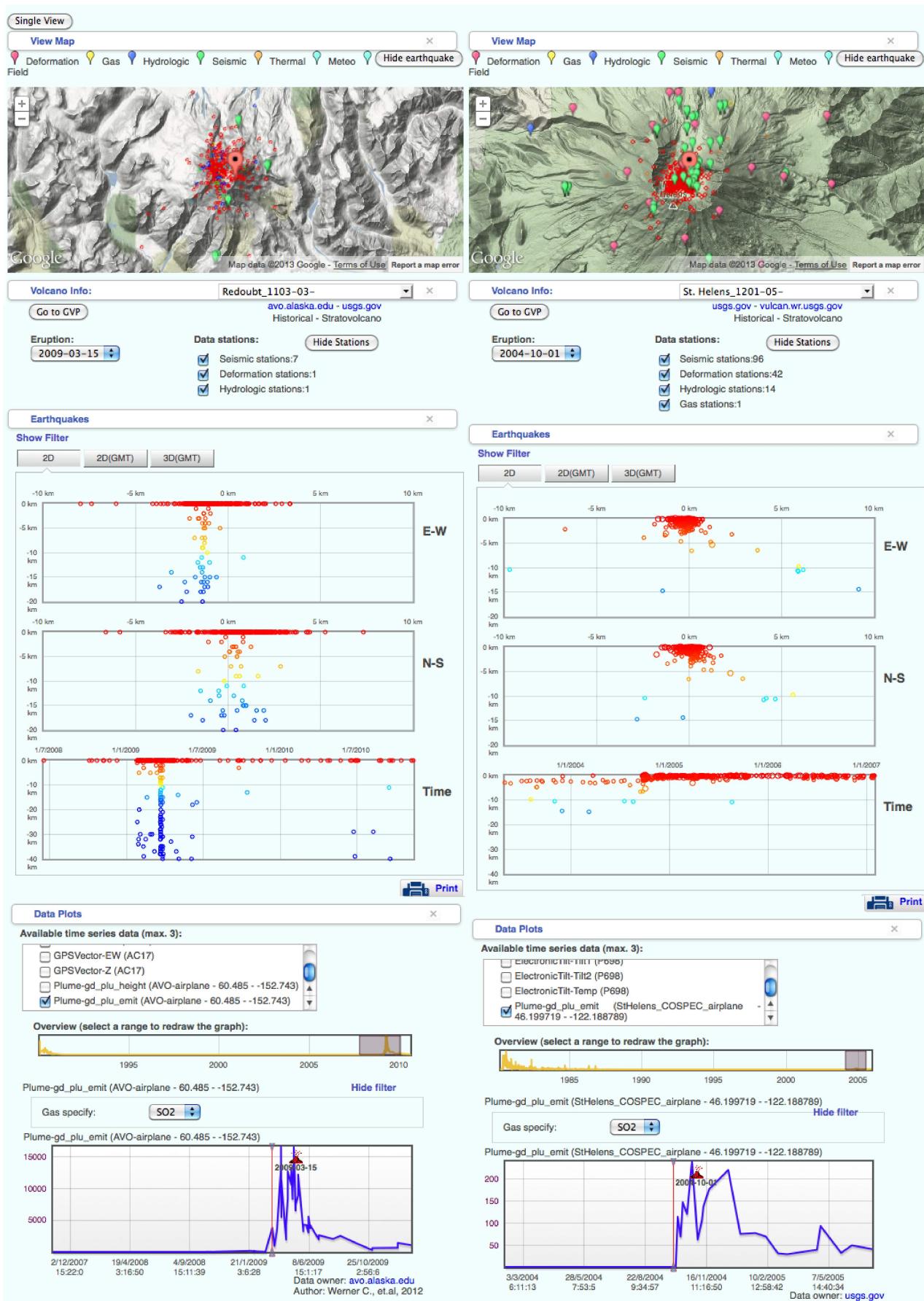


Figure 5. Example of visualization tools: Data comparison between Redoubt (2009) and St. Helens (2004) eruptions.

WOVOdat table structure and format

Overview on WOVOdat, original schema, table structures are described in WOVOdat version 1.0 (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.

*Reference: Venezky, D. Y., and Newhall, C. G., 2007, WOVOdat design document; the schema, table descriptions, and create table statements for the database of worldwide volcanic unrest (WOVOdat version 1.0): U.S. Geological Survey Open File Report 2007-1117, 184 p.
[<http://pubs.usgs.gov/of/2007/1117>]*

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

Volcano

- [Volcano - vd](#)
- [Volcano information - vd_inf](#)
- [Magma chamber - vd_mag](#)
- [Tectonic setting - vd_tec](#)

Eruption

- [Eruption - ed](#)
- [Eruption video - ed_vid](#)
- [Eruption phase - ed_phs](#)
- [Eruption forecast - ed_for](#)

Seismic

- **Monitoring system**
 - [Seismic network - sn](#)
 - [Seismic station - ss](#)
 - [Seismic instrument - si](#)
 - [Seismic component - si_cmp](#)
- **Data**
 - [Event recorded by a network - sd_evn](#)
 - [Event recorded by a single station - sd_evs](#)
 - [Tremor - sd_trm](#)
 - [Intensity - sd_int](#)
 - [Interval - sd_ivl](#)
 - [Waveform - sd_wav](#)
 - [RSAM-SSAM - sd_sam](#)
 - [RSAM data - sd_rsm](#)
 - [SSAM data - sd_ssm](#)

Deformation

- Monitoring system
 - [Common network - cn](#)
 - [Deformation station - ds](#)
 - [Deformation instrument \(general\) - di_gen](#)
 - [Tiltmeter/Strainmeter - di_tlt](#)
- Data
 - [Angle - dd_ang](#)
 - [EDM - dd_edm](#)
 - [GPS - dd_gps](#)
 - [GPS vector - dd_gpv](#)
 - [Leveling - dd_lev](#)
 - [Strain - dd_str](#)
 - [Electronic tilt - dd_tlt](#)
 - [Tilt vector - dd_tlv](#)
 - [InSAR image - dd_sar](#)
 - [InSAR pixel - dd_srd](#)

Fields

- Monitoring system
 - [Common network - cn](#)
 - [Fields station - fs](#)
 - [Fields instrument - fi](#)
- Data
 - [Electric fields - fd_ele](#)
 - [Gravity - fd_gra](#)
 - [Magnetic fields - fd_mag](#)
 - [Magnetic vector - fd_mgv](#)

Gas

- Monitoring system
 - [Common network - cn](#)
 - [Gas station - gs](#)
 - [Gas instrument - gi](#)
- Data
 - [Directly sampled gas - gd](#)
 - [Plume - gd_plu](#)
 - [Soil efflux - gd_sol](#)

Hydrologic

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

Thermal

- Monitoring system
 - [Common network - cn](#)
 - [Thermal station - ts](#)
 - [Thermal instrument - ti](#)
- Data
 - [Ground-based thermal data - td](#)
 - [Thermal image - td_img](#)
 - [Thermal pixel - td_pix](#)

Meteo

- Monitoring system
 - [Common network - cn](#)
 - [Meteo station - ms](#)
 - [Meteo instrument - mi](#)
- Data
 - [Meteo data - med](#)

Inferred processes

- [Hydrothermal system interaction - ip_hyd](#)
- [Magma movement - ip_mag](#)
- [Buildup of magma pressure - ip_pres](#)
- [Volatile saturation - ip_sat](#)
- [Regional tectonics interaction - ip_tec](#)

Other data

- [Contact - cc](#)
- [Bibliographic - cb](#)
- [Observation - co](#)
- [Image - cm](#)

- [Map - md](#)
- [Airplane/Satellite - cs](#)
- [Earthquake terminology translation - st eqt](#)

System

- **Links**
 - [Users to users permissions - jj concon](#)
 - [Image related to data - jj imgx](#)
 - [Contacts for volcanoes - jj volcon](#)
 - [Networks monitoring volcanoes - jj volnet](#)
 - [InSAR images created by satellites - j sarsat](#)
- **Database administration**
 - [Registry - cr](#)
 - [Temporary registry - cr tmp](#)
 - [Permission - cp](#)
 - [Upload history - cu](#)

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A. VOLCANO

A.1. vd – Volcano

The volcano table is one of the fundamental tables of WOVOdat. In this table **vd_id** (the volcano identifier), which links to almost every table, is defined. Main data (Volcano name and CAVW number) for this table will mostly refer to the Smithsonian Global Volcanism Program (SI-GVP) at <http://www.volcano.si.edu/world/volcanocriteria.cfm>

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comment |
|----|--------------------|--------------|-----------------------|------------|------|---------|----------------|------|---|
| 1 | vd_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Volcano identifier (Index) |
| 2 | vd_cavw | varchar(15) | latin1_swe dish_ci | | Yes | NULL | | | the current CAVW number for this volcano |
| 3 | vd_name | varchar(255) | latin1_swe dish_ci | | Yes | NULL | | | Volcano name (first) |
| 4 | vd_name2 | varchar(255) | latin1_swe dish_ci | | Yes | NULL | | | Volcano name (second) |
| 5 | vd_tzone | float | | | Yes | NULL | | | time zone (relative to UTC) |
| 6 | vd_mcont | char(1) | latin1_swe dish_ci | | Yes | NULL | | | multiple contact for this vol- cano |
| 7 | vd_com | varchar(255) | latin1_swe dish_ci | | Yes | NULL | | | Comments |
| 8 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First Contact ID |
| 9 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second Contact ID |
| 10 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third Contact ID |
| 11 | cc_id4 | smallint(5) | | UNSIGNED | Yes | NULL | | | Fourth Contact ID |
| 12 | cc_id5 | smallint(5) | | UNSIGNED | Yes | NULL | | | Fifth Contact ID |
| 13 | vd_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 14 | vd_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 15 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|--------------------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | vd_id | A | No | |
| CAVW NUMBER | BTREE | Yes | No | vd_cavw | A | Yes | |
| cc_id | BTREE | No | No | cc_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id4 | cc.cc_id |
| cc_id5 | cc.cc_id |
| cc_id_load | cc.cc_id |

A.2. vd_inf - Volcano information

This table contains information about the volcano that could possibly change over the life of the database, such as the CAVW number, geomorphology, and other descriptive information. Much of the information will be loaded from

the Smithsonian Global Volcanism Program ‘Volcano reference File (VRF)’.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-------------------------|--|-------------------|------------|------|---------------------|----------------|------|--|
| 1 | vd_inf_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Volcano information identifier (Index) |
| 2 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 3 | vd_inf_cavw | varchar(15) | latin1_swedish_ci | | Yes | NULL | | | the current CAVW number for this volcano |
| 4 | vd_inf_status | enum('Anthropology', 'Ar/Ar', 'Dendrochronology', etc.) | | | No | Un-known | | | Volcano status |
| 5 | vd_inf_desc | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Short narrative |
| 6 | vd_inf_slat | double | | | Yes | NULL | ° | | Summit latitude |
| 7 | vd_inf_slon | double | | | Yes | NULL | ° | | Summit longitude |
| 8 | vd_inf_selev | float | | | Yes | NULL | m | | Summit elevation |
| 9 | vd_inf_type | enum('Caldera', 'Cinder cone', 'Complex volcano',etc.) | | | No | Un-known | | | Type |
| 10 | vd_inf_loc | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Geographic location |
| 11 | vd_inf_rtype | enum('Basalt', 'Tephrit/Trachybasalt', 'Andesite/Basaltic-andesite', etc.) | | | No | Un-known | | | Dominant rock type |
| 12 | vd_inf_evol | float | | | Yes | NULL | m³ | | Volume of edifice |
| 13 | vd_inf_numcald | tinyint(4) | | UNSIGNED | Yes | NULL | | | Number of calderas |
| 14 | vd_inf_lcald_dia | float | | | Yes | NULL | km | | Diameter of largest caldera |
| 15 | vd_inf_ycald_lat | double | | | Yes | NULL | ° | | Latitude of youngest caldera |
| 16 | vd_inf_ycald_lon | double | | | Yes | NULL | ° | | Longitude of youngest caldera |
| 17 | vd_inf_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 18 | vd_inf_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 19 | vd_inf_etime | datetime | | | No | 9999-12-31 23:59:00 | | | End time |
| 20 | vd_inf_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 21 | vd_inf_com | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Comments |
| 22 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Contact ID |
| 23 | vd_inf_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 24 | vd_inf_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 25 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | vd_inf_id | A | No | |
| TYPE | BTREE | No | No | vd_inf_type | A | No | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |
| STATUS | BTREE | No | No | vd_inf_status | A | No | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id_load | cc.cc_id |

vd_inf_status

- ⇒ 'Anthropology', 'Ar/Ar', 'Dendrochronology', 'Fumarolic', 'Historical', 'Holocene', 'Holocene?', 'Hot Springs', 'Hydration Rind', 'Hydrophonic', 'Ice Core', 'Lichenometry', 'Magnetism', 'Pleistocene', 'Potassium-Argon', 'Radiocarbon', 'Seismicity', 'Surface Exposure', 'Tephrochronology', 'Thermoluminescence', 'Uncertain', 'Uranium-series', 'Varve Count', 'Unknown'

vd_inf_type

- ⇒ 'Caldera', 'Cinder cone', 'Complex volcano', 'Compound volcano', 'Cone', 'Crater rows', 'Explosion craters', 'Fissure vent', 'Hydrothermal field', 'Lava cone', 'Lava dome', 'Maar', 'Pumice cone', 'Pyroclastic cone', 'Pyroclastic shield', 'Scoria cone', 'Shield volcano', 'Somma volcano', 'Stratovolcano', 'Subglacial volcano', 'Submarine volcano', 'Tuff cone', 'Tuff ring', 'Unknown', 'Volcanic complex', 'Volcanic field'

vd_inf_rtype

- ⇒ 'Basalt', 'Tephrit/Trachybasalt', 'Andesite/Basaltic-andesite', 'Trachyandesite', 'Dacite', 'Rhyolite', 'Trachyte', 'Phonolite', 'Phonotephrite', 'Foidite', 'Unknown'

A.3. vd_mag - Magma chamber

This table contains information about the magma chamber such as its composition(s) and minimum size (based on the largest eruption volume). The information will obtain from various sources.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-------------------------|--------------|--------------------------|------------|------|---------|----------------|-----------------|---|
| 1 | vd_mag_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Volcano magma chamber identifier (Index) |
| 2 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 3 | vd_mag_lvz_dia | float | | | Yes | NULL | | km | Diameter of low velocity zone |
| 4 | vd_mag_lvz_vol | float | | | Yes | NULL | | km ³ | Volume of low velocity zone |
| 5 | vd_mag_tlvz | float | | | Yes | NULL | | km | Depth to top of low velocity zone |
| 6 | vd_mag_lerup_vol | double | | | Yes | NULL | | km ³ | Volume of largest eruption, DRE |
| 7 | vd_mag_drock | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Dominant rock type |
| 8 | vd_mag_orock | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Outlier rock type |
| 9 | vd_mag_orock2 | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Second outlier rock type |
| 10 | vd_mag_orock3 | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Third outlier rock type |
| 11 | vd_mag_minsio2 | float | | | Yes | NULL | | | Minimum SiO ₂ content of whole rocks erupted |
| 12 | vd_mag_maxsio2 | float | | | Yes | NULL | | | Maximum SiO ₂ content of whole rocks erupted |
| 13 | vd_mag_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 14 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Owner ID |
| 15 | vd_mag_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 16 | vd_mag_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 17 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 18 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-----------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | vd_mag_id | A | No | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

A.4. vd_tec - Tectonic setting

This table contains information about the local tectonic settings, such as rates of movement either along a plate or over a hotspot.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-----------------|--------------|-------------------|------------|------|---------|----------------|------|---|
| 1 | vd_tec_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Tectonic setting identifier (Index) |
| 2 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 3 | vd_tec_desc | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Description |
| 4 | vd_tec_strslip | float | | | Yes | NULL | | cm/a | Rate of strike-slip |
| 5 | vd_tec_ext | float | | | Yes | NULL | | cm/a | Rate of extension |
| 6 | vd_tec_conv | float | | | Yes | NULL | | cm/a | Rate of convergence |
| 7 | vd_tec_travhs | float | | | Yes | NULL | | cm/a | Travel rate across hotspot |
| 8 | vd_tec_com | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Comments |
| 9 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Contact ID |
| 10 | vd_tec_loaddate | datetime | | | Yes | NULL | | | the date the data was entered |
| 11 | vd_tec_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 12 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 13 | cb_ids | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-----------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | vd_tec_id | A | No | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

B. ERUPTION

B.1. ed – Eruption

This table stores general information about an eruption, in general can be classified in different ways based on the style or eruption, composition, duration, and location. The SI-GVP will be a source for most of the data in the eruption table. More additional information on eruption data can be found at <http://www.volcano.si.edu/world/eruptioncriteria.cfm>.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|----------------------|--------------|--------------------------|------------|------|---------|----------------|------|---|
| 1 | ed_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Eruption identifier (index) |
| 2 | ed_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Eruption code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | ed_name | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Eruption name |
| 5 | ed_nar | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Narrative |
| 6 | ed_stime | datetime | | | Yes | NULL | | | Eruption start time |
| 7 | ed_stime_bc | smallint(6) | | | Yes | NULL | | | BC year start time |
| 8 | ed_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 9 | ed_etime | datetime | | | Yes | NULL | | | Eruption end time |
| 10 | ed_etime_bc | smallint(6) | | | Yes | NULL | | | BC year end time |
| 11 | ed_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 12 | ed_climax | datetime | | | Yes | NULL | | | Onset of climax |
| 13 | ed_climax_bc | smallint(6) | | | Yes | NULL | | | BC year of eruption climax |
| 14 | ed_climax_unc | datetime | | | Yes | NULL | | | Onset of climax uncertainty |
| 15 | ed_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 16 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 17 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | second owner ID |
| 18 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 19 | ed_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 20 | ed_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 21 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 22 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ed_id | A | No | |
| CODE | BTREE | No | No | ed_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|-------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |

| | |
|------------|----------|
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

B.2. ed_phs - Eruption phase

This table stores specific information about the eruption such as the size of the phase and composition of magma.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|--------------------------|---------------------|--------------------------|------------|------|---------|----------------|--------------------|--|
| 1 | ed_phs_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Eruption phase identifier |
| 2 | ed_phs_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Eruption phase code |
| 3 | ed_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Eruption identifier |
| 4 | ed_phs_phnum | float | | | Yes | NULL | | | Phase number |
| 5 | ed_phs_stime | datetime | | | Yes | NULL | | | Start time |
| 6 | ed_phs_stime_bc | smallint(6) | | | Yes | NULL | | | Year of start time before Christ |
| 7 | ed_phs_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 8 | ed_phs_etime | datetime | | | Yes | NULL | | | End time |
| 9 | ed_phs_etime_bc | smallint(6) | | | Yes | NULL | | | Year of end time before Christ |
| 10 | ed_phs_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 11 | ed_phs_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 12 | ed_phs_vei | mediumint(9) | | | Yes | NULL | | | VEI (Volcanic Explosivity Index) |
| 13 | ed_phs_max_lext | float | | | Yes | NULL | | m^3/s | Maximum lava extrusion rate |
| 14 | ed_phs_max_expdis | float | | | Yes | NULL | | $kg/s \times 10^6$ | Maximum explosive mass discharge rate |
| 15 | ed_phs_dre | float | | | Yes | NULL | | $m^3 \times 10^6$ | DRE (Dense-Rock Equivalent) |
| 16 | ed_phs_mix | enum('Y', 'N', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Evidence of magma mixing: Y=Yes, N=No, U=Unknown |
| 17 | ed_phs_col | float | | | Yes | NULL | | km | Column height |
| 18 | ed_phs_coldet | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Column height determination |
| 19 | ed_phs_minsio2_mg | float | | | Yes | NULL | | % | Minimum SiO ₂ of matrix glass |
| 20 | ed_phs_maxsio2_mg | float | | | Yes | NULL | | % | Maximum SiO ₂ of matrix glass |
| 21 | ed_phs_minsio2_wr | float | | | Yes | NULL | | % | Minimum SiO ₂ of whole rock |
| 22 | ed_phs_maxsio2_wr | float | | | Yes | NULL | | % | Maximum SiO ₂ of whole rock |
| 23 | ed_phs_totxtl | float | | | Yes | NULL | | % | Total crystallinity |
| 24 | ed_phs_phenc | float | | | Yes | NULL | | % | Phenocryst content |
| 25 | ed_phs_phena | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Phenocryst assemblage |
| 26 | ed_phs_h2o | float | | | Yes | NULL | | | Pre-eruption water content |
| 27 | ed_phs_h2o_xtl | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description of phenocryst and melt inclusion |
| 28 | ed_phs_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 29 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |

| | | | | | | | | | |
|----|------------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 30 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | second owner ID |
| 31 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 32 | ed_phs_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 33 | ed_phs_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 34 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 35 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ed_phs_id | A | No | |
| CODE | BTREE | No | No | ed_phs_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| ERUPTION | BTREE | No | No | ed_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| ed_id | ed.ed_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

B.3. ed_vid - Eruption video

This table stores information about a video clip of the eruption.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-------------------------|--------------|--------------------------|------------|------|-------------|----------------|------|---|
| 1 | ed_vid_id | smallint(5) | | UNSIGNED | No | <i>None</i> | AUTO_INCREMENT | | Eruption video identifier |
| 2 | ed_vid_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Eruption video code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | volcano identifier |
| 4 | ed_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Eruption identifier |
| 5 | ed_phs_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Eruption phase identifier |
| 6 | ed_vid_link | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Link to the file or info where to find the clip |
| 7 | ed_vid_stime | datetime | | | Yes | NULL | | | Start time |
| 8 | ed_vid_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 9 | ed_vid_length | time | | | Yes | NULL | | | Length of the clip |
| 10 | ed_vid_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 11 | ed_vid_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 12 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |

| | | | | | | | | | |
|----|------------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 13 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | second owner ID |
| 14 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 15 | ed_vid_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 16 | ed_vid_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 17 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 18 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|-----------------------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ed_vid_id | A | No | |
| CODE | BTREE | No | No | ed_vid_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |
| ERUPTION | BTREE | No | No | ed_id | A | Yes | |
| ERUPTION PHASE | BTREE | No | No | ed_phs_id | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| vd_id | vd.vd_id |
| ed_id | ed.ed_id |
| ed_phs_id | ed_phs.ed_phs_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

B.4. ed_for - Eruption forecast

This table stores information about forecasts made for a phase of the eruption, such as an overview of the forecast and the times forecasted.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|------------------------|--------------|--------------------------|------------|------|---------|----------------|------|--|
| 1 | ed_for_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Eruption forecast identifier |
| 2 | ed_for_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Eruption forecast code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | ed_phs_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Eruption phase identifier |
| 5 | ed_for_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 6 | ed_for_open | datetime | | | Yes | NULL | | | Earliest expected start time of eruption |
| 7 | ed_for_open_unc | datetime | | | Yes | NULL | | | Earliest expected start time of eruption uncertainty |

| | | | | | | | | | |
|----|-------------------------|---------------------|--------------------------|----------|-----|------|--|--|---|
| 8 | ed_for_close | datetime | | | Yes | NULL | | | Latest expected start time of eruption |
| 9 | ed_for_close_unc | datetime | | | Yes | NULL | | | Latest expected start time of eruption uncertainty |
| 10 | ed_for_time | datetime | | | Yes | NULL | | | Issue date |
| 11 | ed_for_time_unc | datetime | | | Yes | NULL | | | Issue date uncertainty |
| 12 | ed_for_tsucc | enum('Y', 'N', 'P') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Success on time: Y=Yes, N=No, P=Partly |
| 13 | ed_for_msucc | enum('Y', 'N', 'P') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Success on magnitude: Y=Yes, N=No, P=Partly |
| 14 | ed_for_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 15 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 16 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | second owner ID |
| 17 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 18 | ed_for_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 19 | ed_for_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 20 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 21 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ed_for_id | A | No | |
| CODE | BTREE | No | No | ed_for_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |
| ERUPTION PHASE | BTREE | No | No | ed_phs_id | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| vd_id | vd.vd_id |
| ed_phs_id | ed_phs.ed_phs_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

C. SEISMIC MONITORING SYSTEM

C.1. sn - Seismic network

This table contains information about the seismic network such as the velocity model used for computing the event locations and a general overview of the types of instruments used.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-------------------------|---------------------|---------------------------|------------|------|---------------------|----------------|------|--|
| 1 | sn_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Seismic network identifier |
| 2 | sn_code | varchar(30) | <i>latin1_swedish_c i</i> | | Yes | NULL | | | Seismic Network code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | sn_name | varchar(30) | <i>latin1_swedish_c i</i> | | Yes | NULL | | | Seismic Network name |
| 5 | sn_vmodel | varchar(511) | <i>latin1_swedish_c i</i> | | Yes | NULL | | | Description of velocity model |
| 6 | sn_vmodel_detail | varchar(255) | <i>latin1_swedish_c i</i> | | Yes | NULL | | | Link to a file containing additional details about velocity model |
| 7 | sn_zerokm | varchar(255) | <i>latin1_swedish_c i</i> | | Yes | NULL | | m | Elevation of zero km "depth" |
| 8 | sn_fdepth_flag | enum('Y', 'N', 'U') | <i>latin1_swedish_c i</i> | | Yes | NULL | | | Depth is fixed: Y=Yes, N=No, U=Unknown |
| 9 | sn_fdepth | varchar(255) | <i>latin1_swedish_c i</i> | | Yes | NULL | | | Fixed depth description |
| 10 | sn_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 11 | sn_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 12 | sn_etime | datetime | | | No | 9999-12-31 23:59:00 | | | End date |
| 13 | sn_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 14 | sn_tot | tinyint(3) | | UNSIGNED | Yes | NULL | | | Total number of seismometers |
| 15 | sn_bb | tinyint(3) | | UNSIGNED | Yes | NULL | | | Number of broadband seismometers |
| 16 | sn_smp | tinyint(3) | | UNSIGNED | Yes | NULL | | | Number of short- and mid-period seismometers |
| 17 | sn_digital | tinyint(3) | | UNSIGNED | Yes | NULL | | | Number of digital seismometers |
| 18 | sn_analog | tinyint(3) | | UNSIGNED | Yes | NULL | | | Number of analog seismometers |
| 19 | sn_tcomp | tinyint(3) | | UNSIGNED | Yes | NULL | | | Number of 3 component seismometers |
| 20 | sn_micro | tinyint(3) | | UNSIGNED | Yes | NULL | | | Number of microphones |
| 21 | sn_desc | varchar(255) | <i>latin1_swedish_c i</i> | | Yes | NULL | | | Description |
| 22 | sn_utc | float | | | Yes | NULL | | | Difference from UTC |
| 23 | sn_ori | enum('D', 'O') | <i>latin1_swedish_c i</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 24 | sn_com | varchar(255) | <i>latin1_swedish_c i</i> | | Yes | NULL | | | Comments |
| 25 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 26 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 27 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 28 | sn_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 29 | sn_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 30 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person |

| | | | | | | | | | | |
|----|---------------|--------------|--------------------------|--|-----|------|--|--|--|---|
| | | | | | | | | | | who entered the data |
| 31 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | sn_id | A | No | |
| CODE | BTREE | No | No | sn_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

C.2. ss - Seismic station

This table stores information such as a location, name, system gain, and comments about the seismic stations where the data are collected.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|----------------------|----------------|--------------------------|------------|------|---------------------|----------------|------|---|
| 1 | ss_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Seismic station identifier |
| 2 | ss_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Seismic station code |
| 3 | sn_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Seismic network identifier |
| 4 | ss_name | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Seismic station name |
| 5 | ss_lat | double | | | Yes | NULL | ° | | Station Latitude |
| 6 | ss_lon | double | | | Yes | NULL | ° | | Station longitude |
| 7 | ss_elev | float | | | Yes | NULL | m | | Station elevation |
| 8 | ss_depth | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | m | Depth of instruments |
| 9 | ss_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 10 | ss_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 11 | ss_etime | datetime | | | No | 9999-12-31 23:59:00 | | | End date |
| 12 | ss_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 13 | ss_utc | float | | | Yes | NULL | | | Difference from UTC |
| 14 | ss_instr_type | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Instrument types |
| 15 | ss_sgain | float | | | Yes | NULL | | | System gain |
| 16 | ss_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 17 | ss_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |

| | | | | | | | | | |
|----|--------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 18 | ss_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 19 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 20 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 21 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 22 | ss_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 23 | ss_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 24 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 25 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ss_id | A | No | |
| CODE | BTREE | No | No | ss_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| NETWORK | BTREE | No | No | sn_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| sn_id | sn.sn_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

C.3. si - Seismic instrument

This table stores information such as the instrument name, model, number of components and response time.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------|--------------|--------------------------|------------|------|---------|----------------|------|--|
| 1 | si_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Seismic instrument identifier |
| 2 | si_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Seismic instrument code |
| 3 | ss_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | seismic station identifier |
| 4 | si_name | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | The name, model, and manufacturer of the seismic instrument (recorder) |
| 5 | si_type | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Instrument type |
| 6 | si_range | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Dynamic range of seismic instrument |
| 7 | si_igain | float | | | Yes | NULL | | | the instrument gain |
| 8 | si_filter | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Filters, if applied |
| 9 | si_ncomp | tinyint(3) | | UNSIGNED | Yes | NULL | | | Number of components |
| 10 | si_resp | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Response overview |

| | | | | | | | | | |
|----|---------------------|----------------|--------------------------|----------|-----|---------------------|--|--|---|
| | | | <i>i</i> | | | | | | |
| 11 | si_resp_file | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | link to file containing response |
| 12 | si_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 13 | si_stime_unc | datetime | | | Yes | <i>NULL</i> | | | Start date uncertainty |
| 14 | si_etime | datetime | | | No | 9999-12-31 23:59:00 | | | End date |
| 15 | si_etime_unc | datetime | | | Yes | <i>NULL</i> | | | End date uncertainty |
| 16 | si_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | A flag for source of data. D=digitized, O= original from observatory |
| 17 | si_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | Comments |
| 18 | cc_id | smallint(5) | | UNSIGNED | Yes | <i>NULL</i> | | | First owner ID |
| 19 | cc_id2 | smallint(5) | | UNSIGNED | Yes | <i>NULL</i> | | | Second owner ID |
| 20 | cc_id3 | smallint(5) | | UNSIGNED | Yes | <i>NULL</i> | | | Third owner ID |
| 21 | si_loaddate | datetime | | | Yes | <i>NULL</i> | | | the date the data was entered (in UTC) |
| 22 | si_pubdate | datetime | | | Yes | <i>NULL</i> | | | the date the data became public |
| 23 | cc_id_load | smallint(5) | | UNSIGNED | Yes | <i>NULL</i> | | | contact ID for the person who entered the data |
| 24 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | si_id | A | No | |
| CODE | BTREE | No | No | si_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ss_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| ss_id | ss.ss_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

C.4. si_cmp - Seismic component

This table stores information about an individual component (geophone) that sends data to the instrument or recorder such as the component name, model, orientation, band type, and sampling rate.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|--------------------|--------------|--------------------------|------------|------|-------------|----------------|------|-------------------------------|
| 1 | si_cmp_id | smallint(5) | | UNSIGNED | No | <i>None</i> | AUTO_INCREMENT | | Seismic component identifier |
| 2 | si_cmp_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | Seismic component code |
| 3 | si_id | mediumint(8) | | UNSIGNED | Yes | <i>NULL</i> | | | Seismic instrument identifier |

| | | | | | | | | | |
|----|------------------------|----------------|--------------------------|----------|-----|------|--|----|---|
| 4 | si_cmp_name | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | The name, model, and manufacturer of the geophone |
| 5 | si_cmp_type | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Seismic component type |
| 6 | si_cmp_resp | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description of response |
| 7 | si_cmp_band | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Band type (SEED convention) |
| 8 | si_cmp_samp | float | | | Yes | NULL | | Hz | Sampling rate |
| 9 | si_cmp_icode | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Instrument code (SEED convention) |
| 10 | si_cmp_orient | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Orientation code (SEED convention) |
| 11 | si_cmp_sens | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Sensitivity |
| 12 | si_cmp_depth | float | | | Yes | NULL | | m | Depth |
| 13 | si_cmp_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 14 | si_cmp_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 15 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 16 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 17 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 18 | si_cmp_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 19 | si_cmp_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 20 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 21 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|------------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | si_cmp_id | A | No | |
| CODE | BTREE | No | No | si_cmp_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| INSTRUMENT | BTREE | No | No | si_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| si_id | si.si_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

D. SEISMIC DATA

D.1. sd_evn - Seismic event data from a network

This table contains seismic data that were collected from several stations in a network and then processed to give a location.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------------------------|-----------------------------|-----------------------|------------|------|---------|----------------|------|---|
| 1 | sd_evn_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Seismic event identifier |
| 2 | sd_evn_code | varchar(30) | latin1_swe dish_ci | | Yes | NULL | | | Seismic event code |
| 3 | sn_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Seismic network identifier |
| 4 | sd_evn_arch | varchar(255) | latin1_swe dish_ci | | Yes | NULL | | | Location of the seismogram archive |
| 5 | sd_evn_time | datetime | | | Yes | NULL | | | Origin time |
| 6 | sd_evn_timecsec | decimal(2,2) | | | Yes | NULL | | | Centisecond precision for origin time |
| 7 | sd_evn_time_unc | datetime | | | Yes | NULL | | | Origin time uncertainty |
| 8 | sd_evn_timecsec_ unc | decimal(2,2) | | | Yes | NULL | | | Centisecond precision for origin time uncertainty |
| 9 | sd_evn_dur | float | | | Yes | NULL | | s | Average duration of the earthquake as recorded at stations <15 km from the volcano |
| 10 | sd_evn_dur_unc | float | | | Yes | NULL | | s | Uncertainty in average duration of the earthquake |
| 11 | sd_evn_tech | varchar(255) | latin1_swe dish_ci | | Yes | NULL | | | The technique used to locate the event |
| 12 | sd_evn_picks | enum('A', 'R', 'H', 'U') | latin1_swe dish_ci | | Yes | NULL | | | Determination of picks: A=Automatic picker, R=Ruler, H=Human using a computer-based picker, U=Unknown |
| 13 | sd_evn_elat | double | | | Yes | NULL | | ° | Estimated latitude |
| 14 | sd_evn_elon | double | | | Yes | NULL | | ° | Estimated longitude |
| 15 | sd_evn_edep | float | | | Yes | NULL | | km | Estimated depth |
| 16 | sd_evn_fixdep | enum('Y', 'N', 'U') | latin1_swe dish_ci | | Yes | NULL | | | Fixed depth: Y=Yes, N=No, U=Unknown |
| 17 | sd_evn_nst | tinyint(3) | | UNSIGNED | Yes | NULL | | | The total number of seismic stations that reported arrival times for this earthquake |
| 18 | sd_evn_nph | tinyint(3) | | UNSIGNED | Yes | NULL | | | The total number of P and S arrival-time observations used to compute the hypocenter location |
| 19 | sd_evn_gp | float | | | Yes | NULL | | ° | The largest azimuthal gap between azimuthally adjacent stations |
| 20 | sd_evn_dcs | float | | | Yes | NULL | | km | Horizontal distance from the epicenter to the nearest station |
| 21 | sd_evn_rms | float | | | Yes | NULL | | s | RMS travel time residual |
| 22 | sd_evn_herr | float | | | Yes | NULL | | km | The horizontal location error defined as the length of the largest projection of the three principal errors on a horizontal plane |
| 23 | sd_evn_xerr | float | | | Yes | NULL | | km | The maximum x (longitude) |

| | | | | | | | | | |
|----|-------------------------|--|--------------------|--|-----|------|--|----|--|
| | | | | | | | | | |
| 24 | sd_evn_yerr | float | | | Yes | NULL | | | error for cases where the horizontal error is not given |
| 25 | sd_evn_derr | float | | | Yes | NULL | | km | The maximum y (latitude) error for cases where the horizontal error is not given |
| 26 | sd_evn_locqual | varchar(255) | latin1_swe dish_ci | | Yes | NULL | | | The quality of the calculated location |
| 27 | sd_evn_pmag | float | | | Yes | NULL | | | The primary magnitude |
| 28 | sd_evn_pmag_type | varchar(30) | latin1_swe dish_ci | | Yes | NULL | | | The primary magnitude type, e.g., Ms, Mb, Mw, Md (see Appendix 4 for more info) |
| 29 | sd_evn_smag | float | | | Yes | NULL | | | A secondary magnitude |
| 30 | sd_evn_smag_type | varchar(30) | latin1_swe dish_ci | | Yes | NULL | | | Secondary magnitude type |
| 31 | sd_evn_eqtype | enum('R', 'Q', 'V', 'VT', 'VT_D', 'VT_S', 'H', 'H_HLF', 'H_LHF', 'LF', 'LF_LP', 'LF_T', 'LF_ILF', 'VLP', 'E', 'U', 'O', 'X') | | | Yes | NULL | | | WOVOdat classification for the earthquake type (see Appendix 4 for more info) |
| 32 | sd_evn_mtscal | float | | | Yes | NULL | | | The scale of the following moment tensor data. Please store as a multiplier for the moment tensor data |
| 33 | sd_evn_mxx | float | | | Yes | NULL | | | Moment tensor m_xx stored as +/- x.xx |
| 34 | sd_evn_mxy | float | | | Yes | NULL | | | Moment tensor m_xy stored as +/- x.xx |
| 35 | sd_evn_mxz | float | | | Yes | NULL | | | Moment tensor m_xz stored as +/- x.xx |
| 36 | sd_evn_my | float | | | Yes | NULL | | | Moment tensor m_yy |
| 37 | sd_evn_my | float | | | Yes | NULL | | | Moment tensor m_yz |
| 38 | sd_evn_mzz | float | | | Yes | NULL | | | Moment tensor m_zz |
| 39 | sd_evn_strk1 | float | | | Yes | NULL | | ° | Strike 1 of best double couple |
| 40 | sd_evn_strk1_err | float | | | Yes | NULL | | ° | The uncertainty in the value of strike 1 |
| 41 | sd_evn_dip1 | float | | | Yes | NULL | | ° | Dip 1 of best double couple |
| 42 | sd_evn_dip1_err | float | | | Yes | NULL | | ° | The uncertainty in the value of dip 1 |
| 43 | sd_evn_rak1 | float | | | Yes | NULL | | ° | Rake 1 of best double couple |
| 44 | sd_evn_rak1_err | float | | | Yes | NULL | | ° | The uncertainty in the value of rake 1 |
| 45 | sd_evn_strk2 | float | | | Yes | NULL | | ° | Strike 2 of best double couple |
| 46 | sd_evn_strk2_err | float | | | Yes | NULL | | ° | The uncertainty in the value of strike 2 |
| 47 | sd_evn_dip2 | float | | | Yes | NULL | | ° | Dip 2 of best double couple |
| 48 | sd_evn_dip2_err | float | | | Yes | NULL | | ° | The uncertainty in the value of dip 2 |
| 49 | sd_evn_rak2 | float | | | Yes | NULL | | ° | Rake 2 of best double couple |
| 50 | sd_evn_rak2_err | float | | | Yes | NULL | | ° | The uncertainty in the value of rake 2 |
| 51 | sd_evn_foc | varchar(255) | latin1_swe dish_ci | | Yes | NULL | | | The focal plane solution (beachball, w/ arrivals) stored as a .gif for well defined events |

| | | | | | | | | | |
|----|------------------------|----------------|-------------------------------|----------|-----|------|--|----|---|
| 52 | sd_evn_samp | float | | | Yes | NULL | | Hz | The sampling rate |
| 53 | sd_evn_ori | enum('D', 'O') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | A flag for source of data. D =digitized, O = original from observatory |
| 54 | sd_evn_com | varchar(255) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | Comments |
| 55 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 56 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 57 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 58 | sd_evn_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 59 | sd_evn_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 60 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 61 | cb_ids | varchar(255) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|--------------------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | sd_evn_id | A | No | |
| CODE | BTREE | No | No | sd_evn_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| NETWORK | BTREE | No | No | sn_id | A | Yes | |
| TECHNIQUE | BTREE | No | No | sd_evn_tech | A | Yes | |
| latlonIndex | BTREE | No | No | sd_evn_elat | A | Yes | |
| | | | | sd_evn_elon | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| sn_id | sn.sn_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

D.2. sd_evs - Seismic event data from a single station

This table contains seismic data that were collected from a single station and therefore no location can be calculated.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|------------------------|--------------|-------------------------------|------------|------|---------|----------------|------|--------------------------------------|
| 1 | sd_evs_id | mediumint(8) | | UN-SIGNED | No | None | AUTO_INCREMENT | | Seismic event identifier |
| 2 | sd_evs_code | varchar(30) | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Seismic event code |
| 3 | ss_id | mediumint(8) | | UN-SIGNED | Yes | NULL | | | seismic station identifier |
| 4 | sd_evs_time | datetime | | | Yes | NULL | | | Start time |
| 5 | sd_evs_time_ms | decimal(2,2) | | | Yes | NULL | | | Centisecond precision for start time |
| 6 | sd_evs_time_unc | datetime | | | Yes | NULL | | | Start time uncertainty |

| | | | | | | | | | |
|----|----------------------------|--|--------------------------|-----------|-----|------|----|--|--|
| 7 | sd_evs_time_unc_ms | decimal(2,2) | | | Yes | NULL | | | Centisecond precision for start time uncertainty |
| 8 | sd_evs_picks | enum('A', 'R', 'H', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Determination of picks: A=Automatic picker, R=Ruler, H=Human using a computer-based picker, U=Unknown |
| 9 | sd_evs_spint | float | | | Yes | NULL | s | | S-P interval |
| 10 | sd_evs_dur | float | | | Yes | NULL | s | | Duration |
| 11 | sd_evs_dur_unc | float | | | Yes | NULL | s | | Duration uncertainty |
| 12 | sd_evs_dist_activen | float | | | Yes | NULL | km | | Distance from active vent |
| 13 | sd_evs_maxamp-trac | float | | | Yes | NULL | | | Maximum amplitude of trace |
| 14 | sd_evs_samp | float | | | Yes | NULL | Hz | | Sampling rate |
| 15 | sd_evs_eqtype | enum('R', 'Q', 'V', 'VT', 'VT_D', 'VT_S', 'H', 'H_HLF', 'H_LHF', 'LF', 'LF_LP', 'LF_T', 'LF_ILF', 'VLP', 'E', 'U', 'O', 'X') | | | Yes | NULL | | | WOVOdat classification for the earthquake type (see Appendix 4 for more info) |
| 16 | sd_evs_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D =digitized, O = original from observatory |
| 17 | sd_evs_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 18 | cc_id | smallint(5) | | UN-SIGNED | Yes | NULL | | | First owner ID |
| 19 | cc_id2 | smallint(5) | | UN-SIGNED | Yes | NULL | | | Second owner ID |
| 20 | cc_id3 | smallint(5) | | UN-SIGNED | Yes | NULL | | | Third owner ID |
| 21 | sd_evs_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 22 | sd_evs_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 23 | cc_id_load | smallint(5) | | UN-SIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 24 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | sd_evs_id | A | No | |
| CODE | BTREE | No | No | sd_evs_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ss_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| ss_id | ss.ss_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

D.3. sd_int - Intensity

This table was created to store information about the intensities of events that may or may not have been recorded by a station.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------------|----------------|--------------------------|------------|------|---------|----------------|------|---|
| 1 | sd_int_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Sismic intensity identifier |
| 2 | sd_int_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Seismic intensity code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | sd_evn_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Seismic network event identifier |
| 5 | sd_evs_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Single station event identifier |
| 6 | sd_int_time | datetime | | | Yes | NULL | | | Time |
| 7 | sd_int_time_unc | datetime | | | Yes | NULL | | | Time uncertainty |
| 8 | sd_int_city | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | City |
| 9 | sd_int_maxdist | float | | | Yes | NULL | | km | Maximum distance felt |
| 10 | sd_int_maxint | float | | | Yes | NULL | | | Maximum reported intensity |
| 11 | sd_int_maxint_dist | float | | | Yes | NULL | | km | Distance at maximum reported intensity |
| 12 | sd_int_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D =digitized, O = original from observatory |
| 13 | sd_int_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 14 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 15 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 16 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 17 | sd_int_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 18 | sd_int_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 19 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 20 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

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| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | sd_int_id | A | No | |
| CODE | BTREE | No | No | sd_int_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|-----------|------------------|
| vd_id | vd.vd_id |
| sd_evn_id | sd_evn.sd_evn_id |
| sd_evs_id | sd_evs.sd_evs_id |
| cc_id | cc.cc_id |

| | |
|------------|----------|
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

D.4. sd_trm - Tremor

This table contains information about tremor such as the time interval, qualitative depth, dominant frequency, amplitude range, and reduced displacement.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------------|--------------------------|--------------------------|------------|------|---------|----------------|------|---|
| 1 | sd_trm_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Seismic tremor identifier |
| 2 | sd_trm_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Seismic tremor code |
| 3 | sn_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Seismic network identifier |
| 4 | ss_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Seismic station identifier |
| 5 | sd_trm_stime | datetime | | | Yes | NULL | | | Start time |
| 6 | sd_trm_stime_u_nc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 7 | sd_trm_etime | datetime | | | Yes | NULL | | | End time |
| 8 | sd_trm_etime_u_nc | datetime | | | Yes | NULL | | | End time uncertainty |
| 9 | sd_trm_dur_day | float | | | Yes | NULL | | min | Duration per day |
| 10 | sd_trm_dur_day_unc | float | | | Yes | NULL | | min | Duration per day uncertainty |
| 11 | sd_trm_type | enum('G', 'M', 'H', 'C') | | | Yes | NULL | | | WOVOdat classification for the earthquake type (see Appendix 4 for more info) |
| 12 | sd_trm_qdepth | enum('D', 'I', 'S', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Qualitative depth: D=Deep (>10 km), I=Intermediate (4-10 km), S=Shallow (0-4 km), U=Unknown |
| 13 | sd_trm_domfre-q1 | float | | | Yes | NULL | | Hz | Dominant frequency |
| 14 | sd_trm_domfre-q2 | float | | | Yes | NULL | | Hz | Second dominant frequency |
| 15 | sd_trm_maxamp | float | | | Yes | NULL | | | Maximum amplitude |
| 16 | sd_trm_noise | float | | | Yes | NULL | | | Background noise level |
| 17 | sd_trm_reddis | float | | | Yes | NULL | | | Reduced displacement (as estimated using a station >5km from source) |
| 18 | sd_trm_rderr | float | | | Yes | NULL | | | Reduced displacement error |
| 19 | sd_trm_visact | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description of associated visible activity |
| 20 | sd_trm_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 21 | sd_trm_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 22 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 23 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 24 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 25 | sd_trm_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 26 | sd_trm_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 27 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who |

| | | | | | | | | |
|----|---------------|--------------|--------------------------|--|-----|------|--|---|
| | | | | | | | | entered the data |
| 28 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | sd_trm_id | A | No | |
| CODE | BTREE | No | No | sd_trm_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ss_id | A | Yes | |
| NETWORK | BTREE | No | No | sn_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| sn_id | sn.sn_id |
| ss_id | ss.ss_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

D.5. sd_ivl - Interval (swarm)

This table contains data about earthquakes that occur in specified time intervals, e.g., as seismic swarms.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-------------------------|--|--------------------------|------------|------|---------|----------------|------|--|
| 1 | sd_ivl_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Seismic interval identifier |
| 2 | sd_ivl_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Seismic interval code |
| 3 | sn_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Seismic network identifier |
| 4 | ss_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Seismic station identifier |
| 5 | sd_ivl_eqtype | enum('R', 'Q', 'V', 'VT', 'VT_D', 'VT_S', 'H', 'H_HLF', 'H_LHF', 'LF', 'LF_LP', 'LF_T', 'LF_ILF', 'VLP', 'E', 'U', 'O', 'X') | | | Yes | NULL | | | Earthquake type (see Appendix 4 for more info) |
| 6 | sd_ivl_stime | datetime | | | Yes | NULL | | | Start time |
| 7 | sd_ivl_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 8 | sd_ivl_etime | datetime | | | Yes | NULL | | | End time |
| 9 | sd_ivl_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 10 | sd_ivl_hdist | float | | | Yes | NULL | | km | Horizontal distance from summit to swarm center |
| 11 | sd_ivl_avgdepth | float | | | Yes | NULL | | m | Mean depth of the swarm earthquakes |
| 12 | sd_ivl_vdispers | float | | | Yes | NULL | | km | Vertical dispersion(range) of depth over which the swarm earthquakes occurred |
| 13 | sd_ivl_hmigr_hyp | float | | | Yes | NULL | | km | Horizontal migration of hypocenters from/to the summit (outward=positive; inward=negative) |
| 14 | sd_ivl_vmigr_hyp | float | | | Yes | NULL | | km | Vertical migration of hypocen- |

| | | | | | | | | |
|----|-------------------------------|--------------------------|---------------------------|-----|------|--|---------------------|--|
| | | | | | | | | ters (up=positive, down=negative) |
| 15 | sd_ivl_patt | varchar(30) | <i>latin1_swedish_ci</i> | Yes | NULL | | | Temporal pattern (defined pattern) |
| 16 | sd_ivl_data | enum('L', 'C', 'H', 'U') | <i>latin1_swedish_ci</i> | Yes | NULL | | | Data type: L=Located earthquakes, C=Detected by computer trigger algorithm, H=Hand counted, U=Unknown |
| 17 | sd_ivl_picks | enum('A', 'R', 'H', 'U') | <i>latin1_swedish_ci</i> | Yes | NULL | | | Determination of picks: A=Automatic picker, R=Ruler, H=Human using a computer-based picker, U=Unknown |
| 18 | sd_ivl_felt_stime | datetime | | Yes | NULL | | | Felt earthquake counts start time |
| 19 | sd_ivl_felt_stime_ unc | datetime | | Yes | NULL | | | Felt earthquake counts start time uncertainty |
| 20 | sd_ivl_felt_etime | datetime | | Yes | NULL | | | Felt earthquake counts end time |
| 21 | sd_ivl_felt_etime_ unc | datetime | | Yes | NULL | | | felt earthquake counts end time uncertainty |
| 22 | sd_ivl_nrec | mediumint(6) | UNSIGNED | Yes | NULL | | | Number of recorded earthquakes |
| 23 | sd_ivl_nfelt | smallint(4) | UNSIGNED | Yes | NULL | | | Number of felt earthquakes |
| 24 | sd_ivl_etot_stime | datetime | | Yes | NULL | | | Total seismic energy release (seismic moment) measurement start time |
| 25 | sd_ivl_etot_stime_ unc | datetime | | Yes | NULL | | | Total seismic energy release measurement start time uncertainty |
| 26 | sd_ivl_etot_etime | datetime | | Yes | NULL | | | Total seismic energy release measurement end time |
| 27 | sd_ivl_etot_etime_ unc | datetime | | Yes | NULL | | | Total seismic energy release measurement end time uncertainty |
| 28 | sd_ivl_etot | float | | Yes | NULL | | erg ^{-0.5} | Total seismic energy release |
| 29 | sd_ivl_fmin | float | | Yes | NULL | | Hz | Minimum frequency of recorded earthquake |
| 30 | sd_ivl_fmax | float | | Yes | NULL | | Hz | Maximum frequency of recorded earthquake |
| 31 | sd_ivl_amin | float | | Yes | NULL | | | Minimum amplitude of recorded earthquake |
| 32 | sd_ivl_amax | float | | Yes | NULL | | | Maximum amplitude of recorded earthquake |
| 33 | sd_ivl_desc | varchar(255) | <i>latin1_swedish_ci</i> | Yes | NULL | | | Description |
| 34 | sd_ivl_ori | enum('D', 'O') | <i>latin1_swe dish_ci</i> | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 35 | sd_ivl_com | varchar(255) | <i>latin1_swe dish_ci</i> | Yes | NULL | | | comments |
| 36 | cc_id | smallint(5) | UNSIGNED | Yes | NULL | | | First owner ID |
| 37 | cc_id2 | smallint(5) | UNSIGNED | Yes | NULL | | | Second owner ID |
| 38 | cc_id3 | smallint(5) | UNSIGNED | Yes | NULL | | | Third owner ID |
| 39 | sd_ivl_loaddate | datetime | | Yes | NULL | | | the date the data was entered (in UTC) |
| 40 | sd_ivl_pubdate | datetime | | Yes | NULL | | | the date the data become public |

| | | | | | | | | | |
|----|-------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 41 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 42 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

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| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | sd_ivl_id | A | No | |
| CODE | BTREE | No | No | sd_ivl_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| NETWORK | BTREE | No | No | sn_id | A | Yes | |
| STATION | BTREE | No | No | ss_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| sn_id | sn.sn_id |
| ss_id | ss.ss_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

D.6. sd_sam - RSAM-SSAM

This table stores information of the Real-time Seismic Amplitude Measurements (RSAM) and Seismic Spectral Amplitude measurements (SSAM); needed to define the boundaries of the RSAM/SSAM images/graph. The time series data needed to create the graph/image are stored in the individual RSAM(sd_rsm) and SSAM(sd_ssm) tables.

| # | Column | Type | Collation | Attributes | Null | De-default | Extra | Unit | Comments |
|----|-------------------------|----------------|--------------------------|------------|------|------------|-------------|------|--|
| 1 | sd_sam_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCRE- | MENT | Seismic RSAM-SSAM identifier |
| 2 | sd_sam_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Seismic RSAM-SSAM code |
| 3 | ss_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Seismic station identifier |
| 4 | sd_sam_stime | datetime | | | Yes | NULL | | | Start time |
| 5 | sd_sam_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 6 | sd_sam_etime | datetime | | | Yes | NULL | | | End time |
| 7 | sd_sam_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 8 | sd_sam_int | float | | | Yes | NULL | s | | Counting interval |
| 9 | sd_sam_int_unc | float | | | Yes | NULL | s | | Counting interval uncertainty |
| 10 | sd_sam_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 11 | sd_sam_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | comments |
| 12 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 13 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 14 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |

| | | | | | | | | | |
|----|------------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 15 | sd_sam_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 16 | sd_sam_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 17 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 18 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | sd_sam_id | A | No | |
| CODE | BTREE | No | No | sd_sam_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ss_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| ss_id | ss.ss_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

D.6.a. sd_rsm - RSAM data

This table stores the RSAM time series data needed to create an RSAM image/graph defined in sd_sam table.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|-------------------------|--------------|--------------------------|------------|------|---------|----------------|------|--|
| 1 | sd_rsm_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | RSAM data identifier |
| 2 | sd_sam_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | RSAM-SSAM image/graph identifier |
| 3 | sd_rsm_stime | datetime | | | Yes | NULL | | | Start time |
| 4 | sd_rsm_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 5 | sd_rsm_count | float | | | Yes | NULL | | | RSAM count during this interval |
| 6 | sd_rsm_calib | float | | | Yes | NULL | | | Reduced displacement per 100 RSAM counts |
| 7 | sd_rsm_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | comments |
| 8 | sd_rsm_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 9 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

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| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|--------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | sd_rsm_id | A | No | |
| TIME | BTREE | Yes | No | sd_sam_id | A | Yes | |
| | | | | sd_rsm_stime | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| sd_sam_id | sd.sam.sd_sam_id |
| cc_id_load | cc.cc_id |

D.6.b. sd_ssm - SSAM data

This table stores the SSAM time series data needed to create an SSAM image/graph defined in sd_sam table.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------|--------------|-------------------|------------|------|---------|----------------|------|--|
| 1 | sd_ssm_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | SSAM data identifier |
| 2 | sd_sam_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | RSAM-SSAM image/graph identifier |
| 3 | sd_ssm_stime | datetime | | | Yes | NULL | | | Start time |
| 4 | sd_ssm_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 5 | sd_ssm_lowf | float | | | Yes | NULL | | Hz | Low frequency limit |
| 6 | sd_ssm_highf | float | | | Yes | NULL | | Hz | High frequency limit |
| 7 | sd_ssm_count | float | | | Yes | NULL | | | SSAM count during this interval |
| 8 | sd_ssm_calib | float | | | Yes | NULL | | | Reduced displacement per 100 SSAM counts |
| 9 | sd_ssm_com | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | comments |
| 10 | sd_ssm_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 11 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|--------------------|-------|--------|--------|--------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | sd_ssm_id | A | No | |
| TIME AND FREQUENCY | BTREE | Yes | No | sd_sam_id | A | Yes | |
| | | | | sd_ssm_stime | A | Yes | |
| | | | | sd_ssm_lowf | A | Yes | |
| | | | | | | | |

Links

| Field | Link to |
|------------|------------------|
| sd_sam_id | sd.sam.sd_sam_id |
| cc_id_load | cc.cc_id |

D.7. sd_wav - Waveform

This table contains sample of waveforms to highlight common and uncommon events (network event or single-station event or tremor event) at different volcanoes. This waveform table links to the event table.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|-------------|--------------|-------------------|------------|------|---------|----------------|------|----------------------------|
| 1 | sd_wav_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Waveform identifier |
| 2 | sd_wav_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Waveform code |
| 3 | ss_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | seismic station identifier |
| 4 | sd_evn_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Seismic event identifier |
| 5 | sd_evs_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Single event identifier |
| 6 | sd_trm_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Seismic tremor identifier |

| | | | | | | | | | |
|----|------------------------|--------------------------|--------------------------|----------|-----|------|--|--|--|
| 7 | sd_wav_arch | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Location of seismogram archive (institutional address) |
| 8 | sd_wav_link | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Link to archive (path/link to the image file) |
| 9 | sd_wav_dist | enum('P', 'I', 'D', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Distance from summit: P=Proximal (< 2 km), I=Intermediate (2-5 km), D=Distal (> 5 km), U=Unknown |
| 10 | sd_wav_img | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Image/file format of the waveform |
| 11 | sd_wav_info | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Background information |
| 12 | sd_wav_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description of the waveform |
| 13 | sd_wav_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D =digitized, O = original from observatory |
| 14 | sd_wav_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | comments |
| 15 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 16 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 17 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 18 | sd_wav_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 19 | sd_wav_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 20 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 21 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|-------------------|-------|--------|--------|-------------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | sd_wav_id | 0 | A | No | |
| CODE | BTREE | No | No | sd_wav_code | | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | | A | Yes | |
| STATION | BTREE | No | No | ss_id | | A | Yes | |
| EVENT | BTREE | No | No | sd_evn_id | | A | Yes | |
| EVENT TYPE | BTREE | No | No | sd_evs_id | | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| ss_id | ss.ss_id |
| sd_evn_id | sd_evn.sd_evn_id |
| sd_evs_id | sd_evs.sd_evs_id |
| sd_trm_id | sd_trm.sd_trm_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

E. DEFORMATION MONITORING SYSTEM

E.1. cn - Common network (for Deformation network)

This table contains information about the (non-seismic) network of stations that collect data at a particular site, in general at one volcano.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---------------|---|------------|------|---------------------|----------------|-----------------|---|
| 1 | cn_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Common network identifier |
| 2 | cn_code | varchar(30) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | cn_name | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network name |
| 5 | cn_type | | enum('Deformation','Fields','Gas','Hydrologic','Thermal','Meteo','Unknown') | | No | Unknown | | | Common network type |
| 6 | cn_area | float | | | Yes | NULL | | km ² | Network area coverage |
| 7 | cn_map | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Path/link to the Map of the network (from observatory) |
| 8 | cn_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 9 | cn_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 10 | cn_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End time |
| 11 | cn_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 12 | cn_utc | float | | | Yes | NULL | | | Difference from UTC |
| 13 | cn_desc | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Description |
| 14 | cn_ori | enum('D','O') | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 15 | cn_com | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Comments |
| 16 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 17 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 18 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 19 | cn_loaddate | datetime | | | No | None | | | the date the data was entered (in UTC) |
| 20 | cn_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 21 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 22 | cb_ids | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cn_id | A | No | |
| CODE | BTREE | No | No | cn_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| TYPE | BTREE | No | No | cn_type | A | No | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

E.2. ds - Deformation station

This table stores information such as a location, name, and description for stations where deformation or geodetic data are collected.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|----------------|--------------------------|------------|------|---------------------|----------------|------|---|
| 1 | ds_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Deformation station identifier |
| 2 | ds_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Deformation station code |
| 3 | ds_name | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Deformation station name |
| 4 | cn_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Deformation network identifier |
| 5 | ds_perm | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of permanent instruments |
| 6 | ds_nlat | double | | | Yes | NULL | ° | | Station latitude |
| 7 | ds_nlon | double | | | Yes | NULL | ° | | Station longitude |
| 8 | ds_nelev | float | | | Yes | NULL | m | | Station elevation |
| 9 | ds_herr_loc | float | | | Yes | NULL | | | Horizontal precision of station location |
| 10 | ds_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 11 | ds_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 12 | ds_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End time |
| 13 | ds_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 14 | ds_utc | float | | | Yes | NULL | | | Difference from UTC |
| 15 | ds_rflag | enum('Y', 'N') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Reference station: Y=Yes, N=No |
| 16 | ds_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 17 | ds_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 18 | ds_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | comments |
| 19 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 20 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 21 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 22 | ds_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 23 | ds_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 24 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 25 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ds_id | A | No | |
| CODE | BTREE | No | No | ds_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| NETWORK | BTREE | No | No | cn_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cn_id | cn.cn_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

E.3. di_gen - General deformation instrument

This table stores information about each individual instrument.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------|---|--------------------|------------|------|---------------------|----------------|------|---|
| 1 | di_gen_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Deformation instrument identifier |
| 2 | di_gen_code | varchar(30) | latin1_swe dish_ci | | Yes | NULL | | | Deformation instrument code |
| 3 | ds_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Deformation station identifier |
| 4 | di_gen_name | varchar(255) | latin1_swe dish_ci | | Yes | NULL | | | Deformation instrument name |
| 5 | di_gen_type | enum('Angle', 'CGPS', 'EDM', 'EDM_Reflector', 'GPS', 'Total_Station', 'OtherTypes') | | | Yes | NULL | | | Deformation instrument type |
| 6 | di_gen_units | varchar(30) | latin1_swe dish_ci | | Yes | NULL | | | Units measured |
| 7 | di_gen_res | float | | | Yes | NULL | | | instrument resolution |
| 8 | di_gen_stn | float | | | Yes | NULL | | | Signal to noise |
| 9 | di_gen_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 10 | di_gen_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 11 | di_gen_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End time |
| 12 | di_gen_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 13 | di_gen_ori | enum('D', 'O') | latin1_swe dish_ci | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 14 | di_gen_com | varchar(255) | latin1_swe dish_ci | | Yes | NULL | | | Comments |
| 15 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 16 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 17 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 18 | di_gen_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 19 | di_gen_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 20 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

| | | | | | | | | | |
|----|---------------|--------------|------------------------------|--|-----|------|--|--|---|
| 21 | cb_ids | varchar(255) | <i>latin1_sw dish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |
|----|---------------|--------------|------------------------------|--|-----|------|--|--|---|

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | di_gen_id | A | No | |
| CODE | BTREE | No | No | di_gen_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ds_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| ds_id | ds.ds_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

E.4. di_tlt - Tilt/Strain instrument

This table stores information about each individual instrument and provides the necessary data to process raw data from the tilt and strain data tables.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|----------------------|------------------------|------------------------------|------------|------|---------|----------------|-----------------------------|--|
| 1 | di_tlt_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Tilt/strain instrument identifier |
| 2 | di_tlt_code | varchar(30) | <i>latin1_sw dish_ci</i> | | Yes | NULL | | | Tilt/Strain instrument code |
| 3 | ds_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Deformation station identifier |
| 4 | di_tlt_name | varchar(255) | <i>latin1_sw dish_ci</i> | | Yes | NULL | | | Tilt/Strain instrument name |
| 5 | di_tlt_type | enum('Tilt', 'Strain') | <i>latin1_sw dish_ci</i> | | Yes | NULL | | | Tilt/strain instrument type |
| 6 | di_tlt_depth | float | | | Yes | NULL | | m | Depth |
| 7 | di_tlt_units | varchar(30) | <i>latin1_sw dish_ci</i> | | Yes | NULL | | | Units measured |
| 8 | di_tlt_res | float | | | Yes | NULL | | | Resolution |
| 9 | di_tlt_dir1 | float | | | Yes | NULL | | ° | Azimuth of direction 1 (or X for tiltmeter) 0-360° |
| 10 | di_tlt_dir2 | float | | | Yes | NULL | | ° | Azimuth of direction 2 (or Y for tiltmeter) 0-360° |
| 11 | di_tlt_dir3 | float | | | Yes | NULL | | ° | Azimuth of direction 3 (0-360°) |
| 12 | di_tlt_dir4 | float | | | Yes | NULL | | ° | Azimuth of direction 4 (0-360°) |
| 13 | di_tlt_econv1 | float | | | Yes | NULL | | µrad/mV or µstrain/mV | Electronic conversion for component 1 |
| 14 | di_tlt_econv2 | float | | | Yes | NULL | | µrad/mV or µstrain/mV | Electronic conversion for component 2 |
| 15 | di_tlt_econv3 | float | | | Yes | NULL | | µrad/mV | Electronic conversion for |

| | | | | | | | | | |
|----|-------------------------|----------------|--------------------------|----------|-----|---------------------|--|---|---|
| | | | | | | | | or μstrain/mV μrad/mV or μstrain/mV | component 3 |
| 16 | di_tlt_econv4 | float | | | Yes | NULL | | | Electronic conversion for component 4 |
| 17 | di_tlt_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 18 | di_tlt_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 19 | di_tlt_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End time |
| 20 | di_tlt_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 21 | di_tlt_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D =digitized, O = original from observatory |
| 22 | di_tlt_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 23 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 24 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 25 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 26 | di_tlt_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 27 | di_tlt_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 28 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 29 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|----------------|-------|--------|--------|-------------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | di_tlt_id | 83 | A | No | |
| CODE | BTREE | No | No | di_tlt_code | | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| ds_id | ds.ds_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

F. DEFORMATION DATA

F.1. dd_tlt - Electronic tilt

This table contains tilt data that are either raw or processed. Most modern tilt data are collected electronically and continuously.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-----------------------------|----------------|--------------------------|------------|------|---------|----------------|------|---|
| 1 | dd_tlt_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Tilt data identifier |
| 2 | dd_tlt_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Tilt data code |
| 3 | ds_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Deformation station identifier |
| 4 | di_tlt_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Tilt/Strain instrument identifier |
| 5 | dd_tlt_time | datetime | | | Yes | NULL | | | Measurement time |
| 6 | dd_tlt_timecsec | decimal(2,2) | | | Yes | NULL | | | Centisecond precision for measurement time |
| 7 | dd_tlt_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 8 | dd_tlt_timecsec_u_nc | decimal(2,2) | | | Yes | NULL | | | Centisecond precision for measurement time uncertainty |
| 9 | dd_tlt_srate | double | | | Yes | NULL | | sec | Sampling rate |
| 10 | dd_tlt1 | double | | | Yes | NULL | | μrad | Tilt measurement 1 or X (positive is down to the north) |
| 11 | dd_tlt2 | double | | | Yes | NULL | | μrad | Tilt measurement 2 or Y (positive is down to the east) |
| 12 | dd_tlt_err1 | double | | | Yes | NULL | | | Tilt 1 error |
| 13 | dd_tlt_err2 | double | | | Yes | NULL | | | Tilt 2 error |
| 14 | dd_tlt_proc_flg | enum('P', 'R') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Flag: P=Processed, R=Raw |
| 15 | dd_tlt_temp | Double | | | Yes | NULL | | | temperature |
| 16 | dd_tlt_bat | double | | | Yes | NULL | | | battery |
| 17 | dd_tlt_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 18 | dd_tlt_com | Varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | comments |
| 19 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 20 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 21 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 22 | dd_tlt_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 23 | dd_tlt_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 24 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 25 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | dd_tlt_id | A | No | |
| CODE | BTREE | No | No | dd_tlt_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ds_id | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| ds_id | ds.ds_id |
| di_tlt_id | di_tlt.di_tlt_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

F.2. dd_tlv - Tilt vector

This table stores tilt information from sources where we do not have the raw or semi-processed data (i.e. the original data are no longer available) and only have access to tilt vectors.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-------------------------|----------------|--------------------------|------------|------|---------|-----------------|------|---|
| 1 | dd_tlv_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Tilt vector data identifier |
| 2 | dd_tlv_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Tilt vector data code |
| 3 | ds_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Deformation station identifier |
| 4 | di_tlt_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Tilt/Strain instrument identifier |
| 5 | dd_tlv_stime | datetime | | | Yes | NULL | | | Start time |
| 6 | dd_tlv_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 7 | dd_tlv_etime | datetime | | | Yes | NULL | | | End time |
| 8 | dd_tlv_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 9 | dd_tlv_mag | float | | | Yes | NULL | μrad | | Magnitude of the |
| 10 | dd_tlv_azimuth | float | | | Yes | NULL | $^\circ$ | | Azimuth |
| 11 | dd_tlv_magerr | float | | | Yes | NULL | μrad | | Magnitude error |
| 12 | dd_tlv_azierr | float | | | Yes | NULL | $^\circ$ | | Azimuth error |
| 13 | dd_tlv_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D =digitized, O = original from observatory |
| 14 | dd_tlv_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 15 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 16 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 17 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 18 | dd_tlv_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 19 | dd_tlv_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 20 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 21 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | dd_tlv_id | A | No | |
| CODE | BTREE | No | No | dd_tlv_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ds_id | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| ds_id | ds.ds_id |
| di_tlt_id | di_tlt.di_tlt_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

F.3. dd_str - Strain

This table stores both raw and processed strainmeter data. The raw strain data are stored by component, as microstrain with a positive value for contraction and negative value for dilatation. The processed data i.e. volumetric strains are stored in this table in microstrain, shear strains is stored.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-----------------|--------------|-------------------|------------|------|---------|----------------|---------|---|
| 1 | dd_str_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Strain data identifier |
| 2 | dd_str_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Strain data code |
| 3 | ds_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Deformation station identifier |
| 4 | di_tlt_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Deformation instrument identifier |
| 5 | dd_str_time | datetime | | | Yes | NULL | | | Measurement time in UTC |
| 6 | dd_str_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 7 | dd_str_comp1 | double | | | Yes | NULL | | μstrain | Strainmeter component 1 (positive for contraction; negative for dilatation) |
| 8 | dd_str_comp2 | double | | | Yes | NULL | | μstrain | Strainmeter component 2 (positive for contraction; negative for dilatation) |
| 9 | dd_str_comp3 | double | | | Yes | NULL | | μstrain | Strainmeter component 3 (positive for contraction; negative for dilatation) |
| 10 | dd_str_comp4 | double | | | Yes | NULL | | μstrain | Strainmeter component 4 (positive for contraction; negative for dilatation) |
| 11 | dd_str_err1 | double | | | Yes | NULL | | μstrain | Strainmeter component 1 error |
| 12 | dd_str_err2 | double | | | Yes | NULL | | μstrain | Strainmeter component 2 error |
| 13 | dd_str_err3 | double | | | Yes | NULL | | μstrain | Strainmeter component 3 error |
| 14 | dd_str_err4 | double | | | Yes | NULL | | μstrain | Strainmeter component 4 |

| | | | | | | | | | |
|----|--------------------------|----------------|--------------------------|----------|-----|------|---|---------|--|
| | | | | | | | | ain | error |
| 15 | dd_str_vdstr | double | | | Yes | NULL | | μstrain | Volumetric strain change (positive for contraction; negative for dilatation) |
| 16 | dd_str_vdstr_err | double | | | Yes | NULL | | μstrain | Volumetric strain change error |
| 17 | dd_str_sstr_ax1 | double | | | Yes | NULL | | μstrain | Shear strain of axis 1 (gamma-1) |
| 18 | dd_str_azi_ax1 | float | | | Yes | NULL | ° | | Azimuth of axis 1 (gamma-1) in degrees (0-360°); measured from North with clockwise rotation as positive |
| 19 | dd_str_sstr_ax2 | double | | | Yes | NULL | | μstrain | Shear strain of axis 2 (gamma-2) |
| 20 | dd_str_azi_ax2 | float | | | Yes | NULL | ° | | Azimuth of axis 2 (gamma-2) in degrees (0-360°); measured from North with clockwise rotation as positive |
| 21 | dd_str_sstr_ax3 | double | | | Yes | NULL | | μstrain | Shear strain of axis 3 (gamma-3) |
| 22 | dd_str_azi_ax3 | float | | | Yes | NULL | ° | | Azimuth of axis 3 (gamma-3) in degrees (0-360°); measured from North with clockwise rotation as positive |
| 23 | dd_str_stderr1 | double | | | Yes | NULL | | μstrain | Strain for axis 1 uncertainty |
| 24 | dd_str_stderr2 | double | | | Yes | NULL | | μstrain | Strain for axis 2 uncertainty |
| 25 | dd_str_stderr3 | double | | | Yes | NULL | | μstrain | Strain for axis 3 uncertainty |
| 26 | dd_str_pmax | double | | | Yes | NULL | | μstrain | Maximum principal strain |
| 27 | dd_str_pmaxerr | double | | | Yes | NULL | | μstrain | Maximum principal strain uncertainty |
| 28 | dd_str_pmin | double | | | Yes | NULL | | μstrain | Minimum principal strain |
| 29 | dd_str_pminerr | double | | | Yes | NULL | | μstrain | Minimum principal strain uncertainty |
| 30 | dd_str_pmax_dir | float | | | Yes | NULL | ° | | Maximum principal strain direction |
| 31 | dd_str_pmax_direr | float | | | Yes | NULL | ° | | Maximum principal strain direction uncertainty |
| 32 | dd_str_pmin_dir | float | | | Yes | NULL | ° | | Minimum principal strain direction |
| 33 | dd_str_pmin_direr | float | | | Yes | NULL | ° | | Minimum principal strain direction uncertainty |
| 34 | dd_str_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 35 | dd_str_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 36 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 37 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 38 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 39 | dd_str_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 40 | dd_str_pubdate | datetime | | | Yes | NULL | | | the date the data became public |

| | | | | | | | | | |
|----|-------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 41 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 42 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | dd_str_id | A | No | |
| CODE | BTREE | No | No | dd_str_code | A | Yes | |
| STATION | BTREE | No | No | ds_id | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| ds_id | ds.ds_id |
| di_tlt_id | di_tlt.di_tlt_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

F.4. dd_edm - EDM

This table contains Electronic Distance measurement (EDM) data that were collected between two stations, an instrument station and a target or reflector station. EDM is generally collected as part of a campaign but is also possible collected continuously.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------------|----------------|--------------------------|------------|------|---------|----------------|------|---|
| 1 | dd_edm_id | mediumint(8) | | UN-SIGNED | No | None | AUTO_INCREMENT | | EDM data identifier |
| 2 | dd_edm_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | EDM data code |
| 3 | di_gen_id | mediumint(8) | | UN-SIGNED | Yes | NULL | | | General deformation instrument identifier |
| 4 | ds_id1 | mediumint(8) | | UN-SIGNED | Yes | NULL | | | EDM instrument station identifier |
| 5 | ds_id2 | mediumint(8) | | UN-SIGNED | Yes | NULL | | | Target (reflector/mirror) station identifier |
| 6 | dd_edm_time | datetime | | | Yes | NULL | | | Measurement time |
| 7 | dd_edm_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 8 | dd_edm_line | double | | | Yes | NULL | | m | Measured line length |
| 9 | dd_edm_cerr | float | | | Yes | NULL | | m | Constant error (indicator of instrument and reflector error) |
| 10 | dd_edm_serr | float | | | Yes | NULL | | ppm | Scale error (indicator of error in line length due to temperature and pressure) |
| 11 | dd_edm_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |

| | | | | | | | | | |
|----|------------------------|--------------|-------------------------------|-----------|-----|------|--|--|---|
| 12 | dd_edm_com | varchar(255) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | Comments |
| 13 | cc_id | smallint(5) | | UN-SIGNED | Yes | NULL | | | First owner ID |
| 14 | cc_id2 | smallint(5) | | UN-SIGNED | Yes | NULL | | | Second owner ID |
| 15 | cc_id3 | smallint(5) | | UN-SIGNED | Yes | NULL | | | Third owner ID |
| 16 | dd_edm_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 17 | dd_edm_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 18 | cc_id_load | smallint(5) | | UN-SIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 19 | cb_ids | varchar(255) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | dd_edm_id | A | No | |
| CODE | BTREE | No | No | dd_edm_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ds_id1 | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| di_gen_id | di_gen.di_gen_id |
| ds_id1 | ds.ds_id |
| ds_id2 | ds.ds_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

F.5. dd_ang - Angle

This table contains a few angles from early geodetic surveys where someone would stand on a high point (on top of a mountain) and measure the horizontal and vertical angles to prominent features in the area.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|------------------------|--------------|-------------------------|------------|------|---------|----------------|------|--|
| 1 | dd_ang_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Deformation angle data |
| 2 | dd_ang_code | varchar(30) | <i>latin1_swedish_c</i> | | Yes | NULL | | | Deformation angle code |
| 3 | di_gen_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | General deformation instrument identifier |
| 4 | ds_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Theodolite/total station instrument identifier |
| 5 | ds_id1 | mediumint(8) | | UNSIGNED | Yes | NULL | | | Target station 1 ID |
| 6 | ds_id2 | mediumint(8) | | UNSIGNED | Yes | NULL | | | Target station 2 ID |
| 7 | dd_ang_time | datetime | | | Yes | NULL | | | Measurement time |
| 8 | dd_ang_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |

| | | | | | | | | | |
|----|------------------------|----------------|--------------------------|----------|-----|------|--|---|--|
| | | | | | | | | | tainty |
| 9 | dd_ang_hort1 | float | | | Yes | NULL | | ° | Horizontal angle to target 1, as measured by theodolite/total-station (0-360°) |
| 10 | dd_ang_hort2 | float | | | Yes | NULL | | ° | Horizontal angle to target 2, as measured by theodolite/total-station (0-360°) |
| 11 | dd_ang_vert1 | float | | | Yes | NULL | | ° | Vertical angle to target 1, as measured by theodolite/total-station (0-360°) |
| 12 | dd_ang_vert2 | float | | | Yes | NULL | | ° | Vertical angle to target 2, as measured by theodolite/total-station (0-360°) |
| 13 | dd_ang_herr1 | float | | | Yes | NULL | | ° | Error on horizontal angle to target-1 |
| 14 | dd_ang_herr2 | float | | | Yes | NULL | | ° | Error on horizontal angle to target-2 |
| 15 | dd_ang_verr1 | float | | | Yes | NULL | | ° | Error on vertical angle to target-1 |
| 16 | dd_ang_verr2 | float | | | Yes | NULL | | ° | Error on vertical angle to target-2 |
| 17 | dd_ang_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 18 | dd_ang_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 19 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 20 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 21 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 22 | dd_ang_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 23 | dd_ang_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 24 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 25 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

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| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | dd_ang_id | A | No | |
| CODE | BTREE | No | No | dd_ang_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ds_id | A | Yes | |

Links

| Field | Link to |
|-----------|------------------|
| di_gen_id | di_gen.di_gen_id |
| ds_id | ds.ds_id |
| ds_id1 | ds.ds_id |

| | |
|------------|----------|
| ds_id2 | ds.ds_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

F.6. dd_gps - GPS

This table contains continuous and periodic data of GPS positions, collected at a single station and referenced to other station(s).

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------------|--------------------------|-------------------------------|------------|------|---------|-------------------|------|--|
| 1 | dd_gps_id | mediumint(8) | | UNSIGNED | No | None | AUTO AUTOINCRE | | GPS data identifier |
| 2 | dd_gps_code | varchar(30) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | GPS data code |
| 3 | di_gen_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | General deformation instrument ID |
| 4 | ds_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | GPS station identifier |
| 5 | ds_id_ref1 | mediumint(8) | | UNSIGNED | Yes | NULL | | | GPS reference station-1 identifier |
| 6 | ds_id_ref2 | mediumint(8) | | UNSIGNED | Yes | NULL | | | GPS reference station-2 identifier |
| 7 | dd_gps_time | datetime | | | Yes | NULL | | | Measurement time |
| 8 | dd_gps_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 9 | dd_gps_lat | double | | | Yes | NULL | | ° | GPS latitude measurement (+/- xx.xxxxxxxx) |
| 10 | dd_gps_lon | double | | | Yes | NULL | | ° | GPS longitude measurement (+/- xx.xxxxxxxx) |
| 11 | dd_gps_elev | double | | | Yes | NULL | | m | Elevation above sea level |
| 12 | dd_gps_nserr | double | | | Yes | NULL | | ° | N-S error |
| 13 | dd_gps_ewerr | double | | | Yes | NULL | | ° | E-W error |
| 14 | dd_gps_verr | float | | | Yes | NULL | | m | Vertical error |
| 15 | dd_gps_software | varchar(50) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | The software used to determine the position (e.g. GIPSY, BERNSE, GAMIT, etc.) |
| 16 | dd_gps_orbits | varchar(255) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | Orbits used to determine the positions |
| 17 | dd_gps_dur | varchar(255) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | min | Duration of the solution (frequency of measurement and duration of time used to calculate each position) |
| 18 | dd_gps_qual | enum('E', 'G', 'P', 'U') | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | Quality: E=Excellent, G=Good, P=Poor, U=Unknown |
| 19 | dd_gps_ori | enum('D', 'O') | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 20 | dd_gps_com | varchar(255) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | Comments |
| 21 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 22 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 23 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 24 | dd_gps_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |

| | | | | | | | | | |
|----|-----------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 25 | dd_gps_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 26 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 27 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

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| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | dd_gps_id | A | No | |
| CODE | BTREE | No | No | dd_gps_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ds_id | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| di_gen_id | di_gen.di_gen_id |
| ds_id | ds.ds_id |
| ds_id_ref1 | ds.ds_id |
| ds_id_ref2 | ds.ds_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

F.7. dd_gpv - GPS vector

This table contains displacement vectors that were computed from GPS data, processed from the actual position data. The displacement vector can be described in terms of North-, East-, and Vertical displacement (mm). But it can be also described by displacement magnitude (mm), azimuth (0-360°), and vector inclination (0-90°).

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-------------------------|--------------|--------------------------|------------|------|---------|----------------|------|--|
| 1 | dd_gpv_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | GPS vector data identifier |
| 2 | dd_gpv_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | GPS vector data code |
| 3 | di_gen_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | General deformation instrument ID |
| 4 | ds_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | GPS station identifier |
| 5 | dd_gpv_stime | datetime | | | Yes | NULL | | | Start time |
| 6 | dd_gpv_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 7 | dd_gpv_etime | datetime | | | Yes | NULL | | | End time |
| 8 | dd_gpv_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 9 | dd_gpv_dmag | float | | | Yes | NULL | | mm | Displacement magnitude |
| 10 | dd_gpv_daz | float | | | Yes | NULL | | ° | Displacement azimuth (0-360°) |
| 11 | dd_gpv_vincl | float | | | Yes | NULL | | ° | Inclination of displacement vector (0-90°) |
| 12 | dd_gpv_N | float | | | Yes | NULL | | mm | North displacement |
| 13 | dd_gpv_E | float | | | Yes | NULL | | mm | East displacement |
| 14 | dd_gpv_vert | float | | | Yes | NULL | | mm | Vertical displacement |

| | | | | | | | | | |
|----|------------------------|----------------|--------------------------|----------|-----|------|--|----|---|
| 15 | dd_gpv_dherr | float | | | Yes | NULL | | mm | horizontal uncertainty |
| 16 | dd_gpv_dnerr | float | | | Yes | NULL | | mm | North displacement uncertainty |
| 17 | dd_gpv_deerr | float | | | Yes | NULL | | mm | East displacement uncertainty |
| 18 | dd_gpv_dverr | float | | | Yes | NULL | | mm | Vertical uncertainty |
| 19 | dd_gpv_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 20 | dd_gpv_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 21 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 22 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 23 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 24 | dd_gpv_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 25 | dd_gpv_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 26 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 27 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | dd_gpv_id | A | No | |
| CODE | BTREE | No | No | dd_gpv_code | A | Yes | |
| STATION | BTREE | No | No | ds_id | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| di_gen_id | di_gen.di_gen_id |
| ds_id | ds.ds_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

F.8. dd_lev - Leveling

This table contains data of elevation changes between successive benchmarks on a leveling line.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|--------------------|--------------|--------------------------|------------|------|---------|----------------|------|-----------------------------------|
| 1 | dd_lev_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Leveling data identifier |
| 2 | dd_lev_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Leveling data code |
| 3 | di_gen_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | General deformation instrument ID |
| 4 | ds_id_ref | mediumint(8) | | UNSIGNED | Yes | NULL | | | Reference benchmark ID |
| 5 | ds_id1 | mediumint(8) | | UN- | Yes | NULL | | | First benchmark (n) ID |

| | | | | | | | | | |
|----|------------------------|----------------|---------------------------|-----------|-----|------|----|--|---|
| | | | | SIGNED | | | | | |
| 6 | ds_id2 | mediumint(8) | | UN-SIGNED | Yes | NULL | | | Second benchmark (n+1) ID |
| 7 | dd_lev_ord | mediumint(9) | | | Yes | NULL | | | the order of the survey |
| 8 | dd_lev_class | varchar(30) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | the class of the survey |
| 9 | dd_lev_time | datetime | | | Yes | NULL | | | Survey date |
| 10 | dd_lev_time_unc | datetime | | | Yes | NULL | | | Survey date uncertainty |
| 11 | dd_lev_delev | float | | | Yes | NULL | mm | | Elevation change from the first benchmark to the second benchmark |
| 12 | dd_lev_herr | float | | | Yes | NULL | mm | | Elevation change uncertainty |
| 13 | dd_lev_ori | enum('D', 'O') | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 14 | dd_lev_com | varchar(255) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | Comments |
| 15 | cc_id | smallint(5) | | UN-SIGNED | Yes | NULL | | | First owner ID |
| 16 | cc_id2 | smallint(5) | | UN-SIGNED | Yes | NULL | | | Second owner ID |
| 17 | cc_id3 | smallint(5) | | UN-SIGNED | Yes | NULL | | | Third owner ID |
| 18 | dd_lev_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 19 | dd_lev_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 20 | cc_id_load | smallint(5) | | UN-SIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 21 | cb_ids | varchar(255) | <i>latin1_swe dish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | dd_lev_id | A | No | |
| CODE | BTREE | No | No | dd_lev_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ds_id_ref | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| di_gen_id | di_gen.di_gen_id |
| ds_id_ref | ds.ds_id |
| ds_id1 | ds.ds_id |
| ds_id2 | ds.ds_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

F.9. dd_sar - InSAR image

This table contains information about radar interferograms that show deformation of volcanoes. Only select, processed interferograms are included in WOVOdat. A separate InSAR-Satellite (*j_sarsat*) relationship table is available for cases where different satellite were used. The data used to create the interferogram are stored in the InSAR data table (dd_srd).

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-----------------------------|---------------------|--------------------------|------------|------|---------|----------------|------|---|
| 1 | dd_sar_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | InSAR image identifier |
| 2 | dd_sar_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | InSAR image code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | di_gen_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | General deformation instrument ID |
| 5 | cs_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Satellite ID |
| 6 | dd_sar_slat | double | | | Yes | NULL | | ° | The latitude in the starting corner |
| 7 | dd_sar_slon | double | | | Yes | NULL | | ° | The longitude in the starting corner |
| 8 | dd_sar_spos | enum('BLC', 'TLC') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Starting position: BLC=Bottom Left Corner, TLC=Top Left Corner |
| 9 | dd_sar_rord | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | the order of the row (e.g. left to right) |
| 10 | dd_sar_nrows | smallint(5) | | UNSIGNED | Yes | NULL | | | The number of rows in the image |
| 11 | dd_sar_ncols | smallint(5) | | UNSIGNED | Yes | NULL | | | The number of columns in the image |
| 12 | dd_sar_units | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | The units used in the image (e.g. mm) |
| 13 | dd_sar_ndata | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Null data value |
| 14 | dd_sar_loc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Location name of the image (e.g. Yellowstone) |
| 15 | dd_sar_pair | enum('P', 'S', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag indicating if the image is composed of: P=Pair, S=Stacked, U=Unknown |
| 16 | dd_sar_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 17 | dd_sar_dem | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | The DEM used |
| 18 | dd_sar_dord | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | The order in which the bytes are stored (e.g. big endian or little endian) |
| 19 | dd_sar_img1_time | datetime | | | Yes | NULL | | | Date-time of the image 1 was taken |
| 20 | dd_sar_img1_time_unc | datetime | | | Yes | NULL | | | Date of image 1 uncertainty |
| 21 | dd_sar_img2_time | datetime | | | Yes | NULL | | | Date-time of the image 2 was taken |
| 22 | dd_sar_img2_time_unc | datetime | | | Yes | NULL | | | Date of image 2 uncertainty |
| 23 | dd_sar_pixsiz | float | | | Yes | NULL | | m | Pixel size |
| 24 | dd_sar_spacing | float | | | Yes | NULL | | ° | Spacing of rows and columns (in decimal) |

| | | | | | | | | | |
|----|------------------------|--------------------------|--------------------------|----------|-----|------|--|---|---|
| | | | | | | | | | degrees) |
| 25 | dd_sar_lookang | float | | | Yes | NULL | | ° | the look angle |
| 26 | dd_sar_limb | enum('ASC', 'DES') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Limb: ASC=Ascending, DES=Descending |
| 27 | dd_sar_img_path | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Path/link where the interferogram image is stored |
| 28 | dd_sar_geotiff | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Path/link where the GeoTIFF of interferogram is stored |
| 29 | dd_sar_prometh | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Processing method |
| 30 | dd_sar_softwr | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Software used |
| 31 | dd_sar_dem_qual | enum('E', 'G', 'F', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | DEM quality: E=Excellent (1m), G=Good (10m), F=Fair (100m), U=Unknown |
| 32 | dd_sar_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O=original from observatory |
| 33 | dd_sar_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 34 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 35 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 36 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 37 | dd_sar_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 38 | dd_sar_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 39 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 40 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | dd_sar_id | A | No | |
| CODE | BTREE | No | No | dd_sar_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |
| cs_id | BTREE | No | No | cs_id | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| vd_id | vd.vd_id |
| di_gen_id | di_gen.di_gen_id |
| cs_id | cs.cs_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |

| | |
|--------|----------|
| cb_ids | cb.cb_id |
|--------|----------|

F.9.a. j_sarsat - InSAR-satellite junction

This table was created for the many-to-many relationship between the satellite data and the InSAR data.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|-------------------|--------------|-----------|------------|------|---------|----------------|------|--|
| 1 | j_sarsat_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | InSAR satellite junction ID |
| 2 | dd_sar_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | InSAR image ID |
| 3 | cs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Satellite identifier |
| 4 | j_sarsat_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 5 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | j_sarsat_id | A | No | |
| LINK | BTREE | Yes | No | dd_sar_id | A | Yes | |
| | | | | cs_id | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| dd_sar_id | dd_sar.dd_sar_id |
| cs_id | cs.cs_id |
| cc_id_load | cc.cc_id |

F.9.b. dd_srd - InSAR Data pixel

This table contains the data collected by two satellites to create an InSAR image.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|-----------------|--------------|-------------------|------------|------|---------|----------------|------|--|
| 1 | dd_srd_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | InSAR data ID |
| 2 | dd_sar_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | InSAR image ID |
| 3 | dd_srd_numb | int(10) | | UNSIGNED | Yes | NULL | | | pixel number |
| 4 | dd_srd_dchange | float | | | Yes | NULL | | mm | Range of change |
| 5 | dd_srd_com | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Comments |
| 6 | dd_srd_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 7 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|--------------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | dd_srd_id | A | No | |
| PIXEL NUMBER | BTREE | Yes | No | dd_sar_id | A | Yes | |
| | | | | dd_srd_numb | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| dd_sar_id | dd_sar.dd_sar_id |
| cc_id_load | cc.cc_id |

G. FIELDS MONITORING SYSTEM

G.1. cn - Common network (for Fields network)

This table contains information about the (non-seismic) network of stations that collect data at a particular site, in general at one volcano.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---|-------------------------------------|------------|------|---------------------|----------------|-----------------|---|
| 1 | cn_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Common network identifier |
| 2 | cn_code | varchar(30) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | cn_name | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network name |
| 5 | cn_type | enum('Deformation','Fields','Gas','Hydrologic','Thermal','Meteo','Unknown') | | | No | Unknown | | | Common network type |
| 6 | cn_area | float | | | Yes | NULL | | km ² | Network area coverage |
| 7 | cn_map | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Path/link to the Map of the network (from observatory) |
| 8 | cn_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 9 | cn_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 10 | cn_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End time |
| 11 | cn_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 12 | cn_utc | float | | | Yes | NULL | | | Difference from UTC |
| 13 | cn_desc | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Description |
| 14 | cn_ori | enum('D','O') | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 15 | cn_com | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Comments |
| 16 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 17 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 18 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 19 | cn_loaddate | datetime | | | No | None | | | the date the data was entered (in UTC) |
| 20 | cn_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 21 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 22 | cb_ids | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cn_id | A | No | |
| CODE | BTREE | No | No | cn_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| TYPE | BTREE | No | No | cn_type | A | No | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|-------|----------|
| vd_id | vd.vd_id |

| | |
|------------|----------|
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

G.2. fs - Fields station

This table stores information and description of the stations where fields data are collected.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---------------|---------------------------|------------|------|---------------------|----------------|------|--|
| 1 | fs_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Fields satation identifier |
| 2 | fs_code | varchar(30) | <i>latin1_swedisch_ci</i> | | Yes | NULL | | | Fields station code |
| 3 | cn_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Fields network ID |
| 4 | fs_name | varchar(50) | <i>latin1_swedisch_ci</i> | | Yes | NULL | | | Fields station name |
| 5 | fs_lat | double | | | Yes | NULL | ° | | Latitude |
| 6 | fs_lon | double | | | Yes | NULL | ° | | Longitude |
| 7 | fs_elev | float | | | Yes | NULL | m | | Elevation |
| 8 | fs_inst | varchar(255) | <i>latin1_swedisch_ci</i> | | Yes | NULL | | | List of instruments |
| 9 | fs_utc | float | | | Yes | NULL | | | Difference from UTC |
| 10 | fs_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 11 | fs_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 12 | fs_etime | datetime | | | No | 1999-12-31 23:59:00 | | | End date |
| 13 | fs_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 14 | fs_desc | varchar(255) | <i>latin1_swedisch_ci</i> | | Yes | NULL | | | Description |
| 15 | fs_ori | enum('D','O') | <i>latin1_swedisch_ci</i> | | Yes | NULL | | | Source of data (D=digitized from references O=original from observatory) |
| 16 | fs_com | varchar(255) | <i>latin1_swedisch_ci</i> | | Yes | NULL | | | Comments |
| 17 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 18 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 19 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 20 | fs_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 21 | fs_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 22 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 23 | cb_ids | varchar(255) | <i>latin1_swedisch_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | fs_id | A | No | |
| CODE | BTREE | No | No | fs_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| NETWORK | BTREE | No | No | cn_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cn_id | cn.cn_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

G.3. fi - Fields instrument

This table stores information about the instruments used to collect magnetic, electric, and gravity data.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---------------|-------------------|------------|------|---------------------|----------------|------|--|
| 1 | fi_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Fields instrument identifier |
| 2 | fi_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Fields instrument code |
| 3 | fs_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Fields station identifier |
| 4 | fi_name | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | The name, model, and manufacturer of the field instrument (recorder) |
| 5 | fi_type | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | The type of instrument(s) |
| 6 | fi_res | float | | | Yes | NULL | | | The resolution of each individual instrument in the instrument package |
| 7 | fi_units | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | The units each instrument measures |
| 8 | fi_rate | float | | | Yes | NULL | | | The sampling rate for the instrument(s) |
| 9 | fi_filter | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | The filter type, if applicable |
| 10 | fi_orient | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | The orientation of the instrument, if applicable |
| 11 | fi_calc | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Any processing used to convert, clean or correct te raw data. Please note the correctios made. |
| 12 | fi_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 13 | fi_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 14 | fi_etime | datetime | | | No | 1999-12-31 23:59:00 | | | End time |
| 15 | fi_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 16 | fi_ori | enum('D','O') | latin1_swedish_ci | | Yes | NULL | | | Source of data (D=digitized from references O=original from observatory) |
| 17 | fi_com | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Comments |
| 18 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 19 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 20 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 21 | fi_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 22 | fi_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 23 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 24 | cb_ids | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by |

| | | | | | | | | |
|--|--|--|--|--|--|--|--|---------|
| | | | | | | | | a comma |
|--|--|--|--|--|--|--|--|---------|

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | fi_id | A | No | |
| CODE | BTREE | No | No | fi_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | fs_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| fs_id | fs.fs_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

H. FIELDS DATA

H.1. fd_ele - Electric fields

This table contains electric data in digital form. There are two reference stations used for self potential (SP) observation, and single field instrument for all campaign data. If the bandpass filter used, enter the high value in the fd_ele_lpass and the low value in the fd_ele_hpass.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------------|---------------|--------------------------|------------|------|---------|----------------|------|--|
| 1 | fd_ele_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Electric data identifier |
| 2 | fd_ele_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Electric data code |
| 3 | fs_id1 | mediumint(8) | | UNSIGNED | Yes | NULL | | | Fields station identifier (reference station in which the electrode is subtracted, station A in the equation A-B) |
| 4 | fs_id2 | mediumint(8) | | UNSIGNED | Yes | NULL | | | Fields station identifier (reference station in which the electrode being subtracted, station B in the equation A-B) |
| 5 | fi_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Fields instrument identifier (for non-permanent/campaign) |
| 6 | fd_ele_time | datetime | | | Yes | NULL | | | Measurement time |
| 7 | fd_ele_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 8 | fd_ele_field | float | | | Yes | NULL | | mV | The electric field measurement |
| 9 | fd_ele_ferr | float | | | Yes | NULL | | mV | electric field measurement uncertainty |
| 10 | fd_ele_dir | float | | | Yes | NULL | | ° | The direction from station-1 to station-2 (0-360° from North) |
| 11 | fd_ele_hpass | float | | | Yes | NULL | | Hz | High pass filter frequency |
| 12 | fd_ele_lpass | float | | | Yes | NULL | | Hz | Low pass filter frequency |
| 13 | fd_ele_spot | float | | | Yes | NULL | | mV | Self potential between station A and B (1-2 or A-B) |
| 14 | fd_ele_spot_err | float | | | Yes | NULL | | mV | Self potential uncertainty |
| 15 | fd_ele_ares | float | | | Yes | NULL | | Ω m | Apparent resistivity |
| 16 | fd_ele_ares_err | float | | | Yes | NULL | | Ω m | Apparent resistivity uncertainty |
| 17 | fd_ele_dres | float | | | Yes | NULL | | Ω m | Direct resistivity |
| 18 | fd_ele_dres_err | float | | | Yes | NULL | | Ω m | Direct resistivity uncertainty |
| 19 | fd_ele_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Source of data (D=digitized from references O=original from observatory) |
| 20 | fd_ele_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | First owner ID |
| 21 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 22 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 23 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | the date the data was entered (in UTC) |
| 24 | fd_ele_loaddate | datetime | | | Yes | NULL | | | the date the data became public |
| 25 | fd_ele_pubdate | datetime | | | Yes | NULL | | | contact ID for the person who entered the data |
| 26 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | List of cb_ids, link to bibli- |

| | | | | | | | | | |
|----|---------------|--------------|--------------------------|--|-----|------|--|--|---|
| | | | | | | | | | graphy table (cb), separated by a comma |
| 27 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Link to bibliography table |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|-----------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | fd_ele_id | A | No | |
| CODE | BTREE | No | No | fd_ele_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION 1 | BTREE | No | No | fs_id1 | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| fs_id1 | fs.fs_id |
| fs_id2 | fs.fs_id |
| fi_id | fi.fi_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

H.2. fd_gra - Gravity

This table contains gravity data such as field strength and associated vertical displacement.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------------|---------------|--------------------------|------------|------|---------|----------------|------|--|
| 1 | fd_gra_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Gravity data identifier |
| 2 | fd_gra_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | gravity data code |
| 3 | fs_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Fields station identifier |
| 4 | fs_id_ref | mediumint(8) | | UNSIGNED | Yes | NULL | | | Fields reference station ID for gravity measurement |
| 5 | fi_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Gravity fields instrument ID |
| 6 | fd_gra_time | datetime | | | Yes | NULL | | | Measurement time |
| 7 | fd_gra_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 8 | fd_gra_fstr | double | | | Yes | NULL | Gal | | Field strength |
| 9 | fd_gra_ferr | double | | | Yes | NULL | Gal | | Strength uncertainty |
| 10 | fd_gra_vdisp | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Associated vertical displacement: Y=Yes, N=No, U=Unknown |
| 11 | fd_gra_gwater | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Associated change in groundwater level: Y=Yes, N=No, U=Unknown |
| 12 | fd_gra_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Source of data (D=digitized from references O=original from observatory) |
| 13 | fd_gra_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 14 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |

| | | | | | | | | | |
|----|------------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 15 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 16 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 17 | fd_gra_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 18 | fd_gra_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 19 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 20 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | fd_gra_id | A | No | |
| CODE | BTREE | No | No | fd_gra_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | fs_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| fs_id | fs.fs_id |
| fs_id_ref | fs.fs_id |
| fi_id | fi.fi_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

H.3. fd_mag - Magnetic fields

This table contains magnetic data that were collected digitally.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------------|--------------|--------------------------|------------|------|---------|----------------|------|--|
| 1 | fd_mag_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Magnetic field strength ID |
| 2 | fd_mag_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Magnetic field data code |
| 3 | fs_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Fields station identifier |
| 4 | fs_id_ref | mediumint(8) | | UNSIGNED | Yes | NULL | | | Magnetic reference station ID |
| 5 | fi_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Magnetic fields instrument ID |
| 6 | fd_mag_time | datetime | | | Yes | NULL | | | Measurement time |
| 7 | fd_mag_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 8 | fd_mag_f | double | | | Yes | NULL | | nT | The total magnetic field strength (F) |
| 9 | fd_mag_compx | double | | | Yes | NULL | | nT | The X-component of magnetic field strength |
| 10 | fd_mag_compy | double | | | Yes | NULL | | nT | The Y-component of |

| | | | | | | | | | |
|----|------------------------|---------------|--------------------------|----------|-----|------|--|----|--|
| | | | | | | | | | magnetic field strength |
| 11 | fd_mag_compz | double | | | Yes | NULL | | nT | The Z-component of magnetic field strength |
| 12 | fd_mag_ferr | float | | | Yes | NULL | | nT | Total field strength uncertainty |
| 13 | fd_mag_errx | float | | | Yes | NULL | | nT | uncertainty in the X-component |
| 14 | fd_mag_erry | float | | | Yes | NULL | | nT | uncertainty in the Y-component |
| 15 | fd_mag_errz | float | | | Yes | NULL | | nT | uncertainty in the Z-component |
| 16 | fd_mag_highpass | float | | | Yes | NULL | | Hz | High pass filter frequency |
| 17 | fd_mag_lowpass | float | | | Yes | NULL | | Hz | Low pass filter frequency |
| 18 | fd_mag_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Source of data (D=digitized from references O=original from observatory) |
| 19 | fd_mag_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 20 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 21 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 22 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 23 | fd_mag_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 24 | fd_mag_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 25 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 26 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | fd_mag_id | A | No | |
| CODE | BTREE | No | No | fd_mag_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | fs_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| fs_id | fs.fs_id |
| fs_id_ref | fs.fs_id |
| fi_id | fi.fi_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

H.4. fd_mgv - Magnetic vector

This table contains magnetic vector data for which the data for the individual components is unavailable.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-----------------|---------------|-------------------|------------|------|---------|----------------|------|--|
| 1 | fd_mgv_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Magnetic vector identifier |
| 2 | fd_mgv_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Magnetic vector code |
| 3 | fs_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Fields station identifier |
| 4 | fi_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Magnetic field instrument identifier |
| 5 | fd_mgv_time | datetime | | | Yes | NULL | | | Measurement time |
| 6 | fd_mgv_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 7 | fd_mgv_dec | float | | | Yes | NULL | | ° | Measured declination (0-360°) |
| 8 | fd_mgv_incl | float | | | Yes | NULL | | ° | Measured inclination (0-360°) |
| 9 | fd_mgv_ori | enum('D','O') | latin1_swedish_ci | | Yes | NULL | | | Source of data (D=digitized from references O=original from observatory) |
| 10 | fd_mgv_com | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Comments |
| 11 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 12 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 13 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 14 | fd_mgv_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 15 | fd_mgv_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 16 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 17 | cb_ids | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | fd_mgv_id | 0 | A | No | |
| CODE | BTREE | No | No | fd_mgv_code | | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | | A | Yes | |
| STATION | BTREE | No | No | fs_id | | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| fs_id | fs.fs_id |
| fi_id | fi.fi_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

I. GAS MONITORING SYSTEM

I.1. cn - Common network (gas network)

This table contains information about the (non-seismic) network of stations that collect data at a particular site, in general at one volcano.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---|-------------------------------------|------------|------|---------------------|----------------|-----------------|---|
| 1 | cn_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Common network identifier |
| 2 | cn_code | varchar(30) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | cn_name | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network name |
| 5 | cn_type | enum('Deformation','Fields','Gas','Hydrologic','Thermal','Meteo','Unknown') | | | No | Unknown | | | Common network type |
| 6 | cn_area | float | | | Yes | NULL | | km ² | Network area coverage |
| 7 | cn_map | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Path/link to the Map of the network (from observatory) |
| 8 | cn_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 9 | cn_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 10 | cn_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End time |
| 11 | cn_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 12 | cn_utc | float | | | Yes | NULL | | | Difference from UTC |
| 13 | cn_desc | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Description |
| 14 | cn_ori | enum('D','O') | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 15 | cn_com | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Comments |
| 16 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 17 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 18 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 19 | cn_loaddate | datetime | | | No | None | | | the date the data was entered (in UTC) |
| 20 | cn_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 21 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 22 | cb_ids | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cn_id | A | No | |
| CODE | BTREE | No | No | cn_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| TYPE | BTREE | No | No | cn_type | A | No | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|-------|----------|
| vd_id | vd.vd_id |

| | |
|------------|----------|
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

I.2. gs - Gas station

This table stores information such as a location, type of gas body monitored, and a description of the stations where gas data are collected.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---------------|--------------------------|------------|------|------------|----------------|------|--|
| 1 | gs_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Gas station identifier |
| 2 | gs_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Gas station code |
| 3 | gs_name | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Gas station name |
| 4 | cn_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Gas network index |
| 5 | gs_lat | double | | | Yes | NULL | | ° | Latitude |
| 6 | gs_lon | double | | | Yes | NULL | | ° | Longitude |
| 7 | gs_elev | float | | | Yes | NULL | | m | Elevation |
| 8 | gs_inst | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of permanent instruments installed in this site |
| 9 | gs_type | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Type of gas body found at the station (fumarole, diffuse soil degassing, remote plume) |
| 10 | gs_utc | float | | | Yes | NULL | | | Difference from UTC |
| 11 | gs_stime | datetime | | | No | 00:00:00 | | | |
| 12 | gs_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 13 | gs_etime | datetime | | | No | 9999-12-31 | | | |
| 14 | gs_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 15 | gs_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 16 | gs_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 16 | gs_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 17 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 18 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 19 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 20 | gs_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 21 | gs_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 22 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 23 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|--------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | gs_id | A | No | |

| | | | | | | | |
|------|-------|-----|----|----------|---|-----|--|
| CODE | BTREE | Yes | No | gs_code | A | Yes | |
| | | | | cc_id | A | Yes | |
| | | | | gs_stime | A | No | |

Links

| Field | Link to |
|------------|----------|
| cn_id | cn.cn_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

I.3. gi - Gas instrument

This table stores information about the instruments used to collect ground-based and remote gas data.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|--------------|---------------|-------------------|------------|------|---------------------|----------------|------|---|
| 1 | gi_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | gas instrument identifier |
| 2 | gi_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Gas instrument code |
| 3 | cs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Satellite ID, if the instrument is mounted on a satellite or airplane. |
| 4 | gs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Gas station identifier |
| 5 | gi_type | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Type of instrument |
| 6 | gi_name | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | The name, model, and manufacturer of the gas instrument (recorder) |
| 7 | gi_units | varchar(50) | latin1_swedish_ci | | Yes | NULL | | | Measured units |
| 8 | gi_pres | float | | | Yes | NULL | | | Resolution |
| 9 | gi_stn | float | | | Yes | NULL | | | Signal to noise |
| 10 | gi_calib | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Calibration |
| 11 | gi_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 12 | gi_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 13 | gi_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End date |
| 14 | gi_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 15 | gi_ori | enum('D','O') | latin1_swedish_ci | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 16 | gi_com | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Comments |
| 17 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 18 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 19 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 20 | gi_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 21 | gi_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 22 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 23 | cb_ids | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|-----------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | gi_id | A | No | |
| CODE | BTREE | No | No | gi_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| SATELLITE | BTREE | No | No | cs_id | A | Yes | |
| STATION | BTREE | No | No | gs_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cs_id | cs.cs_id |
| gs_id | gs.gs_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

J. GAS DATA

J.1. gd - Directly sampled gas

This table stores gas concentration data collected from a point source at ground sites. The type of point source is defined in the station table. Data include the gas temperature, concentrations, and environmental factors. Directly sampled gas can be collected either continuously or periodically. The species of gas reported can be from one of these possibilities:

- CO₂, SO₂, H₂S, HCl, HF, CH₄, H₂, CO, O₂ (in %w or %vol)
- ³He/⁴He, δ¹³C, δ³⁴S, δ¹⁸O, δD (in "per mil")

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|----------------------|--|--------------------------|------------|------|---------|----------------|-----------------------|---|
| 1 | gd_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Directly sampled gas ID |
| 2 | gd_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Directly sampled gas code |
| 3 | gs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Gas station identifier |
| 4 | gi_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Gas instrument identifier |
| 5 | gd_time | datetime | | | Yes | NULL | | | Sampling/Measurement time |
| 6 | gd_time_unc | datetime | | | Yes | NULL | | | Sampling/Measurement time uncertainty |
| 7 | gd_gtemp | float | | | Yes | NULL | | °C | Gas temperature |
| 8 | gd_bp | float | | | Yes | NULL | | mbar | Atmospheric pressure at the time of the measurement |
| 9 | gd_flow | float | | | Yes | NULL | | | Measured gas emision rate |
| 10 | gd_species | enum('CO2', 'SO2', 'H2S', 'HCl', 'HF', 'CH4', 'H2', 'CO', ' ³ He/ ⁴ He', 'd13C', 'd34S', 'd18O', 'dD', 'O2') | | | Yes | NULL | | %w or %vol or per mil | Species or ratio of gas reported (CO ₂ , SO ₂ , H ₂ S, HCl, HF, CH ₄ , H ₂ , CO, O ₂ , ³ He/ ⁴ He, d ¹³ C, d ³⁴ S, d ¹⁸ O, dD) |
| 11 | gd_waterfree_flag | enum('Y', 'N') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Water free gas: Y=Yes, N=No |
| 12 | gd_units | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Reported units |
| 13 | gd_concentration | float | | | Yes | NULL | | | Gas concentration |
| 14 | gd_concentration_err | float | | | Yes | NULL | | | Gas concentration uncertainty |
| 15 | gd_recalc | enum('O', 'R') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Recalculated value: O=Original, R=Recalculated |
| 16 | gd_envir | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Environmental factors |
| 17 | gd_submin | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Information on sublimate minerals |
| 18 | gd_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 19 | gd_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 20 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 21 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 22 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 23 | gd_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 24 | gd_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 25 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 26 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | gd_id | A | No | |
| CODE | BTREE | No | No | gd_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | gs_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| gs_id | gs.gs_id |
| gi_id | gi.gi_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

J.2. gd_plu - Plume

This table stores gas data collected (continuously or periodically) from a plume including the location of the vent, the height of the plume, and the gas emission rates.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------|--|-------------------|------------|------|---------|----------------|-------------|---|
| 1 | gd_plu_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Gas plume data identifier |
| 2 | gd_plu_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Gas plume data code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano ID |
| 4 | cs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Satellite ID |
| 5 | gs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Gas station ID |
| 6 | gi_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Gas instrument ID |
| 7 | gd_plu_lat | double | | | Yes | NULL | | ° | Latitude of the vent in decimal degrees |
| 8 | gd_plu_lon | double | | | Yes | NULL | | ° | Longitude of the vent in decimal degrees |
| 9 | gd_plu_height | float | | | Yes | NULL | | km | Height of the plume in km above the vent |
| 10 | gd_plu_hdet | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | the method used to measure the height |
| 11 | gd_plu_time | datetime | | | Yes | NULL | | | Measurement time in UTC |
| 12 | gd_plu_time_u_nc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 13 | gd_plu_species | enum('CO2', 'SO2', 'H2S', 'HCl', 'HF', 'CO') | latin1_swedish_ci | | Yes | NULL | | | Species of gas reported (CO ₂ , SO ₂ , H ₂ S, HCl, HF, and CO) |
| 14 | gd_plu_units | varchar(30) | latin1_swedish_ci | | Yes | NULL | | t/d or kg/s | Reported units |
| 15 | gd_plu_emit | float | | | Yes | NULL | | | Gas emission rate |
| 16 | gd_plu_emit_err | float | | | Yes | NULL | | | Emission rate uncertainty |
| 17 | gd_plu_recalc | enum('O', 'R') | latin1_swedish_ci | | Yes | NULL | | | Recalculated value flag: O=Original(value directly from measurement), R=Recalcu- |

| | | | | | | | | | |
|----|-------------------------|---------------|--------------------------|----------|-----|------|---|-----|---|
| | | | | | | | | | lated(value recalculated from other parameter) |
| 18 | gd_plu_wind | float | | | Yes | NULL | | m/s | Wind speed |
| 19 | gd_plu_wsmin | Float | | | Yes | NULL | | m/s | Minimum wind speed |
| 20 | gd_plu_wsmax | Float | | | Yes | NULL | | m/s | Maximum wind speed |
| 21 | gd_plu_wdir | Varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | ° | | Dominant wind direction |
| 22 | gd_plu_weth | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Weather notes |
| 23 | gd_plu_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 24 | gd_plu_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 25 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 26 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 27 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 28 | gd_plu_load-date | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 29 | gd_plu_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 30 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 31 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | gd_plu_id | A | No | |
| CODE | BTREE | No | No | gd_plu_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |
| STATION | BTREE | No | No | gs_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cs_id | cs.cs_id |
| gs_id | gs.gs_id |
| gi_id | gi.gi_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

J.3. gd_sol - Soil efflux

This table stores a daily total flux value for an individual gas species.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|--------------------|--------------|--------------------------|------------|------|---------|----------------|------|---------------------|
| 1 | gd_sol_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Soil Efflux data ID |
| 2 | gd_sol_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Soil Efflux code |

| | | | | | | | | | |
|----|------------------------------|---------------|-------------------------------|----------|-----|------|---------------------|-------------------------|---|
| | | | <i>edish_ci</i> | | | | | | |
| 3 | gs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Gas station ID |
| 4 | gi_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Gas instrument ID |
| 5 | gd_sol_time | datetime | | | Yes | NULL | | | Measurement time |
| 6 | gd_sol_time_u nc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 7 | gd_sol_species | varchar(30) | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Mesured species (CO ₂ , Radon, etc.) |
| 8 | gd_sol_tflux | float | | | Yes | NULL | t/d | Total flux | |
| 9 | gd_sol_flux_err | float | | | Yes | NULL | t/d | Total flux uncertainty | |
| 10 | gd_sol_pts | smallint(5) | | UNSIGNED | Yes | NULL | | | Number of points |
| 11 | gd_sol_area | float | | | Yes | NULL | m ² | The area measured | |
| 12 | gd_sol_high | float | | | Yes | NULL | g/m ² /d | Highest individual flux | |
| 13 | gd_sol_htemp | float | | | Yes | NULL | °C | Highest temperature | |
| 14 | gd_sol_units | varchar(30) | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Reported units |
| 15 | gd_sol_ori | enum('D','O') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 16 | gd_sol_com | varchar(255) | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Comments |
| 17 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 18 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | m/s | Second owner ID | |
| 19 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 20 | gd_sol_load- date | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 21 | gd_sol_pubd- ate | datetime | | | Yes | NULL | | | the date the data become public |
| 22 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 23 | cb_ids | varchar(255) | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | gd_sol_id | A | No | |
| CODE | BTREE | No | No | gd_sol_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | gs_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| gs_id | gs.gs_id |
| gi_id | gi.gi_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

K. HYDROLOGIC MONITORING SYSTEM

The hydrology section of WOVOdat contains water monitoring data that are collected from water wells, springs, or crater lakes, all broadly indicative of groundwater conditions and possible role of groundwater in volcanic unrest.

K.1. cn - Common network (Hydrologic network)

This table contains information about the (non-seismic) network of stations that collect data at a particular site, in general at one volcano.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---|-------------------------------------|------------|------|---------------------|----------------|-----------------|---|
| 1 | cn_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Common network identifier |
| 2 | cn_code | varchar(30) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | cn_name | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network name |
| 5 | cn_type | enum('Deformation','Fields','Gas',' Hydrologic ', 'Thermal','Meteo','Unknown') | | | No | Unknown | | | Common network type |
| 6 | cn_area | float | | | Yes | NULL | | km ² | Network area coverage |
| 7 | cn_map | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Path/link to the Map of the network (from observatory) |
| 8 | cn_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 9 | cn_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 10 | cn_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End time |
| 11 | cn_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 12 | cn_utc | float | | | Yes | NULL | | | Difference from UTC |
| 13 | cn_desc | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Description |
| 14 | cn_ori | enum('D','O') | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 15 | cn_com | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Comments |
| 16 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 17 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 18 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 19 | cn_loaddate | datetime | | | No | None | | | the date the data was entered (in UTC) |
| 20 | cn_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 21 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 22 | cb_ids | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cn_id | A | No | |
| CODE | BTREE | No | No | cn_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| TYPE | BTREE | No | No | cn_type | A | No | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

K.2. hs - Hydrologic station

This table stores information such as location, type of water body, and descriptions for stations where hydrologic data are collected. There are often multiple instruments at a station and some observatories may use an instrument at multiple stations; therefore the instrument will be linked directly to the hydrologic data.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---------------|--------------------------|------------|------|---------------------|----------------|------|--|
| 1 | hs_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Hydrologic station ID |
| 2 | hs_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Hydrologic station code |
| 3 | cn_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Hydrologic network ID |
| 4 | hs_lat | double | | | Yes | NULL | | ° | Latitude |
| 5 | hs_lon | double | | | Yes | NULL | | ° | Longitude |
| 6 | hs_elev | float | | | Yes | NULL | | m | Elevation |
| 7 | hs_perm | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of permanent instruments |
| 8 | hs_name | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Hydrologic station name |
| 9 | hs_type | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Type of water body (well, lake, spring, etc.) |
| 10 | hs_utc | float | | | Yes | NULL | | | Difference from UTC |
| 11 | hs_tscr | float | | | Yes | NULL | | m | Top of screen (top of the interval open to inflow in meter below the surface) |
| 12 | hs_bscr | float | | | Yes | NULL | | m | Bottom of screen (top of the interval open to inflow in meter below the surface) |
| 13 | hs_tdepth | double | | | Yes | NULL | | m | Total depth of well |
| 14 | hs_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 15 | hs_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 16 | hs_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End date |
| 17 | hs_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 18 | hs_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 19 | hs_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 20 | hs_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 21 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 22 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 23 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 24 | hs_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 25 | hs_pubdate | datetime | | | Yes | NULL | | | the date the data became public |

| | | | | | | | | | |
|----|-------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 26 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 27 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | hs_id | A | No | |
| CODE | BTREE | No | No | hs_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| NETWORK | BTREE | No | No | cn_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cn_id | cn.cn_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

K.3. hi - Hydrologic instrument

This table stores information about each individual hydrologic instrument.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|----------------|--------------------------|------------|------|---------------------|----------------|------|---|
| 1 | hi_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Hydrologic instrument identifier |
| 2 | hi_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Hydrologic instrument code |
| 3 | hs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Hydrologic station identifier |
| 4 | hi_name | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | The name, model, and manufacturer of the hydrologic instrument (recorder) |
| 5 | hi_type | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Type of the instrument (float, pressure transducer, bubbler, rain gauge, barometer, flow meter, pH or conductivity meter) |
| 6 | hi_meas | enum('A', 'V') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Pressure measurement type: A=Absolute, V=Vented(gauge) |
| 7 | hi_units | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Measured units |
| 8 | hi_res | float | | | Yes | NULL | | | Measurement resolution/precision |
| 9 | hi_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 10 | hi_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 11 | hi_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End date |
| 12 | hi_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 13 | hi_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 14 | hi_ori | enum('D', 'O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original |

| | | | | | | | | | |
|----|--------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| | | | | | | | | | from observatory |
| 15 | hi_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 16 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 17 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 18 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 19 | hi_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 20 | hi_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 21 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 22 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | hi_id | A | No | |
| CODE | BTREE | No | No | hi_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | hs_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| hs_id | hs.hs_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

L. HYDROLOGIC DATA

L.1. hd - Hydrologic data

This table stores all of the water data including temperature, water depth, and concentrations. The data are collected either continuously or periodically as part of a campaign. The most common campaign data are water levels, temperature, pH, and conductance, but chemical concentrations can also be included.

Type of compound, kation, anion or ratio could have one of the following possibilities: SO₄, H₂S for total sulfide, Cl⁻, F⁻, HCO₃⁻, Mg, Fe, Ca, Na, K, R₂O₃, SiO₂, Free CO₂, B, As, Li, Ba, Al (in mg/L), ³He/⁴He, ³He/⁴He corrected, for corrected ratio from air contamination, δ¹³C, δ³⁴S, δD, δ¹⁸O (in per mil).

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-----------------|---|-------------------|------------|------|---------|----------------|------------------------|--|
| 1 | hd_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Hydrologic data ID |
| 2 | hd_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Hydrologic data code |
| 3 | hs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Hydrologic station ID |
| 4 | hi_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Hydrologic instrument ID |
| 5 | hd_time | datetime | | | Yes | NULL | | | Measurement time |
| 6 | hd_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 7 | hd_temp | float | | | Yes | NULL | | °C | Water temperature |
| 8 | hd_welev | double | | | Yes | NULL | | m | The elevation of the water level above sea level |
| 9 | hd_wdepth | double | | | Yes | NULL | | m | Water depth below the ground surface |
| 10 | hd_dwlev | double | | | Yes | NULL | | m | Change in water level (if the water depth and water elevation are not available) |
| 11 | hd_bp | float | | | Yes | NULL | | mbar | Barometric pressure at the time of measurement |
| 12 | hd_sdisc | double | | | Yes | NULL | | L/s | Spring discharge rate |
| 13 | hd_prec | float | | | Yes | NULL | | mm | measured precipitation (daily) |
| 14 | hd_dprec | float | | | Yes | NULL | | mm | Daily precipitation of preceding day |
| 15 | hd_tprec | enum('R', 'FR', 'S', 'H', 'R-FR', 'R-S', 'R-H', 'FR-R', 'FR-S', 'FR-H', 'S-R', 'S-FR', 'S-H', 'H-R', 'H-FR', 'H-S') | | | Yes | NULL | | | Type of precipitation: R=Rain, FR=Freezing Rain, S=Snow, H=Hail, or any combination |
| 16 | hd_ph | float | | | Yes | NULL | | | pH of the water |
| 17 | hd_ph_err | float | | | Yes | NULL | | | pH standard error |
| 18 | hd_cond | float | | | Yes | NULL | | µhos/cm or µSiemens/cm | Conductivity |
| 19 | hd_cond_err | float | | | Yes | NULL | | µhos/cm or µSiemens/cm | Conductivity standard error |
| 20 | hd_comp_species | enum('SO4', 'H2S', 'Cl', 'F', 'HCO3', 'Mg', 'Fe', 'Ca', 'Na', 'K', '3He4He', 'c3He4He', 'd13C', 'd34S', 'dD', 'd18O') | | | Yes | NULL | | | Type of compound, kation, anion or ratio (SO ₄ , H ₂ S for total sulfide, Cl ⁻ , F ⁻ , HCO ₃ ⁻ , Mg, Fe, Ca, Na, K, ³ He/ ⁴ He, ³ He/ ⁴ He corrected, d ¹³ C, d ³⁴ S, dD, d ¹⁸ O) |
| 21 | hd_comp_units | varchar(30) | latin1_swedish_ci | | Yes | NULL | | mg/L or per mil | Reported units (concentrations of common ions in |

| | | | | | | | | | |
|----|----------------------------|---------------|--------------------------|----------|-----|------|--|------|---|
| | | | | | | | | | mg/L or per mil) |
| 22 | hd_comp_content | float | | | Yes | NULL | | | Content of compound, kation, anion or ratio |
| 23 | hd_comp_content_err | float | | | Yes | NULL | | | Content of compound, kation, anion or ratio error |
| 24 | hd_atemp | Float | | | Yes | NULL | | °C | Air temperture |
| 25 | hd_tds | Float | | | Yes | NULL | | mg/L | Total dissolved solids (TDS) |
| 26 | hd_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 27 | hd_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 28 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 29 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 30 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 31 | hd_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 32 | hd_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 33 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 34 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

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| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|----------------|-------|--------|--------|---------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | hd_id | 77137 | A | No | |
| CODE | BTREE | No | No | hd_code | 77137 | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | 1 | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | 77137 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | 77137 | A | Yes | |
| STATION | BTREE | No | No | hs_id | 22 | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| hs_id | hs.hs_id |
| hi_id | hi.hi_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

M. THERMAL MONITORING SYSTEM

Thermal tables contain ground-based data collected at the thermal site or image data collected remotely. These data can be collected continuously or periodically.

M.1. cn - Common network (Thermal network)

This table contains information about the (non-seismic) network of stations that collect data at a particular site, in general at one volcano.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|--|-------------------------------------|------------|------|---------------------|----------------|-----------------|---|
| 1 | cn_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Common network identifier |
| 2 | cn_code | varchar(30) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | cn_name | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network name |
| 5 | cn_type | enum('Deformation','Fields','Gas','Hydrologic',' Thermal ','Meteo','Unknown') | | | No | Unknown | | | Common network type |
| 6 | cn_area | float | | | Yes | NULL | | km ² | Network area coverage |
| 7 | cn_map | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Path/link to the Map of the network (from observatory) |
| 8 | cn_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 9 | cn_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 10 | cn_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End time |
| 11 | cn_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 12 | cn_utc | float | | | Yes | NULL | | | Difference from UTC |
| 13 | cn_desc | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Description |
| 14 | cn_ori | enum('D','O') | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 15 | cn_com | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Comments |
| 16 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 17 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 18 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 19 | cn_loaddate | datetime | | | No | None | | | the date the data was entered (in UTC) |
| 20 | cn_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 21 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 22 | cb_ids | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

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| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cn_id | A | No | |
| CODE | BTREE | No | No | cn_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| TYPE | BTREE | No | No | cn_type | A | No | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

M.2. ts - Thermal station

This table stores information such as a location, name, and a description for stations where thermal data are collected.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---------------|--------------------------|------------|------|---------------------|----------------|------|--|
| 1 | ts_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Thermal station ID |
| 2 | ts_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Thermal station code |
| 3 | cn_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Thermal network ID |
| 4 | ts_name | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Thermal station or benchmark name |
| 5 | ts_type | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Type of thermal feature at the site (e.g. soil, fumarole, surface or crack in a dome, spring, crater lake, etc.) or if the station is used to collect remote image data. |
| 6 | ts_ground | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Soil or ground type |
| 7 | ts_lat | float | | | Yes | NULL | | ° | Latitude |
| 8 | ts_lon | float | | | Yes | NULL | | ° | Longitude |
| 9 | ts_elev | float | | | Yes | NULL | | m | Elevation |
| 10 | ts_perm | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of permanent instruments |
| 11 | ts_utc | float | | | Yes | NULL | | | Difference from UTC (- for hours before or ahead of GMT) |
| 12 | ts_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 13 | ts_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 14 | ts_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End date |
| 15 | ts_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 16 | ts_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 17 | ts_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 18 | ts_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 19 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 20 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 21 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 22 | ts_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 23 | ts_pubdate | datetime | | | Yes | NULL | | | the date the data became public |

| | | | | | | | | | |
|----|-------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 24 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 25 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

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| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ts_id | A | No | |
| CODE | BTREE | No | No | ts_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| NETWORK | BTREE | No | No | cn_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cn_id | cn.cn_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

M.3. ti - Thermal instrument

This table was created to store information about the instruments used to collect ground-based and remote thermal data.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---------------|--------------------------|------------|------|---------------------|----------------|------|--|
| 1 | ti_id | smallint(5) | | UNSIGNED | No | <i>None</i> | AUTO_INCREMENT | | Thermal instrument ID |
| 2 | ti_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Thermal instrument code |
| 3 | cs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Satellite identifier (for instrument mounted on a satellite or airplane) |
| 4 | ts_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Thermal station ID (for instruments installed at a station) |
| 5 | ti_type | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Type of instrument |
| 6 | ti_name | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | The name, manufacturer, and model of the instrument. |
| 7 | ti_units | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | the units the instrument measures |
| 8 | ti_pres | float | | | Yes | NULL | | | typical instrumental measuring precision |
| 9 | ti_stn | float | | | Yes | NULL | | | Signal to noise ratio of the instrument |
| 10 | ti_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 11 | ti_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 12 | ti_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End date |
| 13 | ti_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 14 | ti_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |

| | | | | | | | | | |
|----|--------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 15 | ti_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 16 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 17 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 18 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 19 | ti_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 20 | ti_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 21 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 22 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|-----------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ti_id | A | No | |
| CODE | BTREE | No | No | ti_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ts_id | A | Yes | |
| SATELLITE | BTREE | No | No | cs_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cs_id | cs.cs_id |
| ts_id | ts.ts_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

N. THERMAL DATA

Thermal image data can be collected from an instrument mounted to a moving object e.g. satellite or airplane (thermal image table link to cs_id) or mounted to a stationary object e.g. caldera rim, observatory roof, etc.(thermal image table link to ts_id).

N.1. td - Ground-based thermal data

This table stores all non-image of the thermal data collected on the ground. This data can be collected continuously or periodically.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|----------------|--------------------------|------------|------|---------|----------------|-----------------------|---|
| 1 | td_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Ground-based thermal data |
| 2 | td_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Ground based thermal code |
| 3 | ts_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Thermal station ID |
| 4 | ti_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Thermal instrument ID |
| 5 | td_mtype | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Measurement type (e.g. thermo-couple, thermal IR, etc.) |
| 6 | td_time | datetime | | | Yes | NULL | | | Measurement time |
| 7 | td_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 8 | td_depth | float | | | Yes | NULL | | m | Depth of measurement below the ground surface (to derive geothermal gradients and/or heat flux) |
| 9 | td_distance | float | | | Yes | NULL | | m | Distance from instrument to the measured object |
| 10 | td_calc_flag | enum('O', 'R') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Recalculated value flag: O=Original/directly measured, R=Recalculated from other parameter |
| 11 | td_temp | float | | | Yes | NULL | | °C | Measured temperature |
| 12 | td_terr | float | | | Yes | NULL | | °C | Temperature standard error |
| 13 | td_aarea | float | | | Yes | NULL | | m ² | Approximate area of the body measured |
| 14 | td_flux | float | | | Yes | NULL | | W/m ² | Heat flux |
| 15 | td_ferr | float | | | Yes | NULL | | W/m ² | Heat flux standard error |
| 16 | td_bkgg | float | | | Yes | NULL | | °C/km | Background geothermal gradient |
| 17 | td_tcond | float | | | Yes | NULL | | W/(m ² °C) | Thermal conductivity at the station/measurement point, inferred from the soil type or measured intrinsically. |
| 18 | td_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitalized, O= original from observatory |
| 19 | td_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 20 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 21 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 22 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 23 | td_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 24 | td_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 25 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 26 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

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| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | td_pix_id | A | No | |
| LAT/LON | BTREE | Yes | No | td_img_id | A | Yes | |
| | | | | td_pix_lat | A | Yes | |
| | | | | td_pix_lon | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| td_img_id | td_img.td_img_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

N.2. td_img - Thermal image

This table contains data collected from space, the air, or the ground that are used to create thermal images. The actual pixel-by-pixel data of the image are stored in the Thermal image data table (td_pix).

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-----------------|--------------|-------------------|------------|------|---------|----------------|--|---|
| 1 | td_img_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Thermal image ID |
| 2 | td_img_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Thermal image code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano ID |
| 4 | cs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Satellite ID |
| 5 | ts_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Thermal station ID |
| 6 | ti_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Thermal instrument ID |
| 7 | td_img_iplat | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Description of instrument platform (e.g. airplane, satellite, crater rim, etc.) |
| 8 | td_img_ialt | float | | | Yes | NULL | m | | Instrument altitude |
| 9 | td_img_ilat | float | | | Yes | NULL | ° | | Instrument latitude |
| 10 | td_img_ilon | float | | | Yes | NULL | ° | | Instrument longitude |
| 11 | td_img_idatum | varchar(50) | latin1_swedish_ci | | Yes | NULL | | | Datum used for latitude or longitude |
| 12 | td_img_desc | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Description of the image |
| 13 | td_img_time | datetime | | | Yes | NULL | | | Time of the image was taken |
| 14 | td_img_time_unc | datetime | | | Yes | NULL | | | Time uncertainty |
| 15 | td_img_bname | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Band name (each band separated by coma) |
| 16 | td_img_hwave | float | | | Yes | NULL | μm | | High band wavelength |
| 17 | td_img_lwave | float | | | Yes | NULL | μm | | Low band wavelength |
| 18 | td_img_path | blob | | BINARY | Yes | NULL | | | Directory path/link where the image is stored |
| 19 | td_img_psize | float | | | Yes | NULL | m | | Pixel size of the image |
| 20 | td_img_maxrad | float | | | Yes | NULL | | W/(m ² -m) × 10 ⁷ | Maximum radiance of any pixel in the frame |
| 21 | td_img_maxrrad | float | | | Yes | NULL | | W/(m ² -m × sr) × 10 ⁷ | Maximum relative radiance (sr is spectral |

| | | | | | | | | |
|----|------------------------|---------------|--------------------------|----------|-----|------|-------------------------------|---|
| | | | | | | | | radiance, wavelength dependent) |
| 22 | td_img_maxtemp | float | | | Yes | NULL | °C | Temperature of the hottest pixel |
| 23 | td_img_totrad | float | | | Yes | NULL | $W/(m^2 \cdot m) \times 10^7$ | Total radiance in the whole surface of the frame (integration of all pixel radiances) |
| 24 | td_img_maxflux | float | | | Yes | NULL | W/m^2 | Maximum heat flux |
| 25 | td_img_ntres | float | | | Yes | NULL | °C | Nominal temperature resolution (per pixel) |
| 26 | td_img_atmcorr | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | Atmospheric correction procedure/method applied |
| 27 | td_img_thmcorr | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | Thermal correction procedure/method applied using ground truth points |
| 28 | td_img_ortho | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | Type of orthorectification procedure used |
| 29 | Td_img_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | A flag for source of data. D=digitized, O=original from observatory |
| 30 | td_img_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | Comments |
| 31 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | First owner ID |
| 32 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | Second owner ID |
| 33 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | Third owner ID |
| 34 | td_img_loaddate | datetime | | | Yes | NULL | | the date the data was entered (in UTC) |
| 35 | td_img_pubdate | datetime | | | Yes | NULL | | the date the data became public |
| 36 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | contact ID for the person who entered the data |
| 37 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | td_img_id | A | No | |
| CODE | BTREE | No | No | td_img_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ts_id | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|-------|----------|
| vd_id | vd.vd_id |
| cs_id | cs.cs_id |
| ts_id | ts.ts_id |
| ti_id | ti.ti_id |

| | |
|------------|----------|
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

N.3. td_pix - Thermal pixel data

This table contains data for each pixel of a thermal image.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------|--------------|-------------------|------------|------|---------|----------------|---|--|
| 1 | td_pix_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Image data ID |
| 2 | td_img_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Thermal image ID |
| 3 | td_pix_elev | float | | | Yes | NULL | | m | Elevation of the pixel center |
| 4 | td_pix_lat | float | | | Yes | NULL | | ° | Latitude of the pixel center |
| 5 | td_pix_lon | float | | | Yes | NULL | | ° | Longitude of the pixel center |
| 6 | td_pix_rad | float | | | Yes | NULL | | W/(m ² -m) × 10 ⁷ | Pixel radiance |
| 7 | td_pix_flux | float | | | Yes | NULL | | W/m ² | Pixel heat flux |
| 8 | td_pix_temp | float | | | Yes | NULL | | °C | Pixel temperature |
| 9 | td_pix_com | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Comments |
| 10 | td_pix_load_date | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 11 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | td_pix_id | A | No | |
| LAT/LON | BTREE | Yes | No | td_img_id | A | Yes | |
| | | | | td_pix_lat | A | Yes | |
| | | | | td_pix_lon | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| td_img_id | td_img.td_img_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

O. METEOROLOGICAL MONITORING SYSTEM

This section of WVOdat contains meteorological monitoring data that are collected from available meteorological station around the volcano, to support other monitoring data and possible indication of volcanic unrest.

O.1. cn - Common network (Meteo network)

This table contains information about the (non-seismic) network of stations that collect data at a particular site, in general at one volcano.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---------------|--|------------|------|---------------------|----------------|-----------------|---|
| 1 | cn_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Common network identifier |
| 2 | cn_code | varchar(30) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano identifier |
| 4 | cn_name | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Common network name |
| 5 | cn_type | | enum('Deformation','Fields','Gas','Hydrologic','Thermal',' Meteo ','Unknown') | | No | Unknown | | | Common network type |
| 6 | cn_area | float | | | Yes | NULL | | km ² | Network area coverage |
| 7 | cn_map | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Path/link to the Map of the network (from observatory) |
| 8 | cn_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 9 | cn_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 10 | cn_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End time |
| 11 | cn_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 12 | cn_utc | float | | | Yes | NULL | | | Difference from UTC |
| 13 | cn_desc | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Description |
| 14 | cn_ori | enum('D','O') | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 15 | cn_com | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | Comments |
| 16 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 17 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 18 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 19 | cn_loaddate | datetime | | | No | None | | | the date the data was entered (in UTC) |
| 20 | cn_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 21 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 22 | cb_ids | varchar(255) | <i>latin1_swe</i> <i>dish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cn_id | A | No | |
| CODE | BTREE | No | No | cn_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| TYPE | BTREE | No | No | cn_type | A | No | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

N.2. ms - Meteo station

This table stores information such as location, and descriptions for stations where meteorological data are collected.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|---------------|--------------------------|------------|------|---------------------|----------------|------|---|
| 1 | ms_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Meteorological station ID |
| 2 | ms_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Meteorological station code |
| 3 | cn_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Meteorology network ID |
| 4 | ms_name | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Meteorology station name |
| 5 | ms_lat | double | | | Yes | NULL | | ° | Latitude |
| 6 | ms_lon | double | | | Yes | NULL | | ° | Longitude |
| 7 | ms_elev | float | | | Yes | NULL | | m | Elevation |
| 8 | ms_perm | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of permanent instruments |
| 9 | ms_type | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Type of station (airport, local, regional, observatory, etc.) |
| 10 | ms_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 11 | ms_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 12 | ms_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End date |
| 13 | ms_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 14 | ms_utc | float | | | Yes | NULL | | | Difference from UTC |
| 15 | ms_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 16 | ms_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O=original from observatory |
| 17 | ms_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 18 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 19 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 20 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 21 | ms_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 22 | ms_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 23 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 24 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ms_id | A | No | |
| CODE | BTREE | No | No | ms_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| NETWORK | BTREE | No | No | cn_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cn_id | cn.cn_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

O.3. mi - Meteo instrument

This table stores information about each individual meteorological instrument. The instruments are either permanently or temporarily installed as part of a campaign.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|--------------|---------------|-------------------|------------|------|---------------------|----------------|------|--|
| 1 | mi_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Meteorological instrument identifier |
| 2 | mi_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Meteorological instrument code |
| 3 | ms_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Meteorological station identifier |
| 4 | mi_name | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | The name, model, and manufacturer of the meteorological instrument (recorder) |
| 5 | mi_type | varchar(50) | latin1_swedish_ci | | Yes | NULL | | | Type of the instrument (rain gauge, windvane, anemometer, barometer or air pressure sensor, thermometer, soil thermometer, etc.) |
| 6 | mi_units | varchar(50) | latin1_swedish_ci | | Yes | NULL | | | Measured units |
| 7 | mi_res | float | | | Yes | NULL | | | Measurement resolution/precision |
| 8 | mi_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start date |
| 9 | mi_stime_unc | datetime | | | Yes | NULL | | | Start date uncertainty |
| 10 | mi_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End date |
| 11 | mi_etime_unc | datetime | | | Yes | NULL | | | End date uncertainty |
| 12 | mi_desc | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Description |
| 13 | mi_ori | enum('D','O') | latin1_swedish_ci | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 14 | mi_com | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Comments |
| 15 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 16 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |

| | | | | | | | | | |
|----|--------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| 17 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 18 | mi_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 19 | mi_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 20 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 21 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|----------------|-------|--------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | mi_id | 1 | A | No | |
| OWNER 1 | BTREE | No | No | cc_id | | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | | A | Yes | |
| STATION | BTREE | No | No | ms_id | | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| ms_id | ms.ms_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

P. METEOROLOGICAL DATA

P.1. med - Meteo data

This table stores all of the meteo data including precipitation, wind speed, wind direction, air temperature, soil temperature, barometric pressure, and humidity. The data are collected either continuously or periodically as part of a campaign.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|----------------------|---|--------------------------|------------|------|---------|----------------|------|--|
| 1 | med_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Meteo data ID |
| 2 | med_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Meteo data code |
| 3 | ms_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Meteo station ID |
| 4 | mi_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Meteo instrument ID |
| 5 | med_time | datetime | | | Yes | NULL | | | Measurement time |
| 6 | med_time_unc | datetime | | | Yes | NULL | | | Measurement time uncertainty |
| 7 | med_temp | float | | | Yes | NULL | | °C | air temperature |
| 8 | med_stemp | float | | | Yes | NULL | | °C | soil temperature |
| 9 | med_bp | float | | | Yes | NULL | | mbar | Barometric pressure at the time of measurement |
| 10 | med_prec | float | | | Yes | NULL | | mm | measured precipitation (daily) |
| 11 | med_tprec | enum('R', 'FR', 'S', 'H', 'R-FR', 'R-S', 'R-H', 'FR-R', 'FR-S', 'FR-H', 'S-R', 'S-FR', 'S-H', 'H-R', 'H-FR', 'H-S') | | | Yes | NULL | | | Type of precipitation: R=Rain, FR=Freezing Rain, S=Snow, H=Hail, or any combination |
| 12 | med_hd | float | | | Yes | NULL | | % | humidity |
| 13 | med_wind | float | | | Yes | NULL | | m/s | Wind speed |
| 14 | med_wsmin | float | | | Yes | NULL | | m/s | Minimum wind speed |
| 15 | med_wsmax | float | | | Yes | NULL | | m/s | Maximum wind speed |
| 16 | med_wdir | varchar(30) | | | Yes | NULL | | | Wind direction |
| 17 | med_obs | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Observer (person reporting) |
| 18 | med_clc | float | | | Yes | NULL | | | Cloud coverage |
| 19 | med_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 20 | med_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 21 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 21 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 22 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 23 | med_load-date | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 24 | med_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 25 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 26 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|----------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | med_id | A | No | |
| CODE | BTREE | No | No | med_code | A | Yes | |

| | | | | | | | |
|---------|-------|----|----|--------|---|-----|--|
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ms_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| ms_id | ms.ms_id |
| mi_id | mi.mi_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

Q. INFERRED PROCESSES

This tables were created to store historical inferences about processes causing volcanic unrest, based mostly on published references. Each of the inferred process fields should express in a one-character flag (Y for yes, N for no, M for maybe, and U for unknown or no information).

Q.1. ip_hyd - Hydrothermal system interaction

This table stores information about magmatic interactions with the hydrothermal system.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-------------------------|--------------------------|--------------------------|------------|------|---------|----------------|------|---|
| 1 | ip_hyd_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Hydrothermal data ID |
| 2 | ip_hyd_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Hydrothermal data code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano ID |
| 4 | ip_hyd_time | datetime | | | Yes | NULL | | | The date and time the inference was made. |
| 5 | ip_hyd_time_unc | datetime | | | Yes | NULL | | | Inference time uncertainty |
| 6 | ip_hyd_start | datetime | | | Yes | NULL | | | Start time, the time at which the inferred process began |
| 7 | ip_hyd_start_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 8 | ip_hyd_end | datetime | | | Yes | NULL | | | End time, the time at which the inferred process ended |
| 9 | ip_hyd_end_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 10 | ip_hyd_gwater | enum('Y', 'N', 'M', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Convective heating of groundwater: Y=Yes, N=No, M=Maybe, U=Unknown |
| 11 | ip_hyd_ipor | enum('Y', 'N', 'M', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Destabilization of edifice by pore pressure increase: Y=Yes, N=No, M=Maybe, U=Unknown |
| 12 | ip_hyd_edef | enum('Y', 'N', 'M', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Elastic deformation induced by pore pressure change Y=Yes, N=No, M=Maybe, U=Unknown |
| 13 | ip_hyd_hfrac | enum('Y', 'N', 'M', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Hydrofracturing: Y=Yes, N=No, M=Maybe, U=Unknown |
| 14 | ip_hyd_btr-em | enum('Y', 'N', 'M', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Boiling induced tremor: Y=Yes, N=No, M=Maybe, U=Unknown |
| 15 | ip_hyd_ab-gas | enum('Y', 'N', 'M', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Absorption of soluble gases: Y=Yes, N=No, M=Maybe, U=Unknown |
| 16 | ip_hyd_species | enum('Y', 'N', 'M', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Change in equilibrium species: Y=Yes, N=No, M=Maybe, U=Unknown |
| 17 | ip_hyd_chim | enum('Y', 'N', 'M', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Boiling until dry chimneys are formed: Y=Yes, N=No, M=Maybe, U=Unknown |
| 18 | ip_hyd_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 19 | ip_hyd_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 20 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 21 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 22 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 23 | ip_hyd_load | datetime | | | Yes | NULL | | | the date the data was entered |

| | | | | | | | | | |
|----|------------------------|--------------|--------------------------|----------|-----|------|--|--|---|
| | date | | | | | | | | (in UTC) |
| 24 | ip_hyd_pub_date | datetime | | | Yes | NULL | | | the date the data become public |
| 25 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 26 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ip_hyd_id | A | No | |
| CODE | BTREE | No | No | ip_hyd_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

Q.2. ip_mag - Magma movement

This table stores information about processes related to the movement of magma.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-------------------------|--------------------------|--------------------------|------------|------|---------|----------------|------|--|
| 1 | ip_mag_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Magma movement ID |
| 2 | ip_mag_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Magma movement code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano ID |
| 4 | ip_mag_time | datetime | | | Yes | NULL | | | The date and time the inference was made. |
| 5 | ip_mag_time_unc | datetime | | | Yes | NULL | | | Inference time uncertainty |
| 6 | ip_mag_start | datetime | | | Yes | NULL | | | Start time, the time at which the inferred process began |
| 7 | ip_mag_start_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 8 | ip_mag_end | datetime | | | Yes | NULL | | | End time, the time at which the inferred process ended |
| 9 | ip_mag_end_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 10 | ip_mag_deep-supp | enum('Y', 'N', 'M', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | New or renewed supply of magma from depth: Y=Yes, N=No, M=Maybe, U=Unknown |
| 11 | ip_mag_asc | enum('Y', 'N', 'M', 'U') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Magma ascent, up from reservoir: Y=Yes, N=No, M=Maybe, U=Unknown |

| | | | | | | | | | |
|----|------------------------------|-----------------------------|-------------------------------|----------|-----|------|--|--|--|
| 12 | ip_mag_con- vb | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Magma conection/overtun in- duced from below by an intru- sion at the base: Y=Yes, N=No, M=Maybe, U=Unknown |
| 13 | ip_mag_conv a | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Magma convection/overtun in- duced from above, by settling of a dense crystal-rich mass: Y=Yes, N=No, M=Maybe, U=Unknown |
| 14 | ip_mag_mix | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Magma mixing: Y=Yes, N=No, M=Maybe, U=Unknown |
| 15 | ip_mag_dike | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Dike intrusion: Y=Yes, N=No, M=Maybe, U=Unknown |
| 16 | ip_mag_pipe | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Intrusion through a pipe-like cyl- indrical conduit: Y=Yes, N=No, M=Maybe, U=Unknown |
| 17 | ip_mag_sill | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Sill intrusion: Y=Yes, N=No, M=Maybe, U=Unknown |
| 18 | ip_mag_ori | enum('D', 'O') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | A flag for source of data. D=di- gitized, O= original from obser- vatory |
| 19 | ip_mag_com | varchar(255) | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Comments |
| 20 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 21 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 22 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 23 | ip_mag_load- date | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 24 | ip_mag_pub- date | datetime | | | Yes | NULL | | | the date the data become public |
| 25 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 26 | cb_ids | varchar(255) | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibli- ography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ip_mag_id | A | No | |
| CODE | BTREE | No | No | ip_mag_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

Q.3. ip_pres - Buildup of magma pressure

This table stores information about processes related to an increase in magmatic pressure.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-------------------|--------------------------|-------------------|------------|------|---------|----------------|------|---|
| 1 | ip_pres_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Magma pressure ID |
| 2 | ip_pres_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Magma pressure code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano ID |
| 4 | ip_pres_time | datetime | | | Yes | NULL | | | The date and time the inference was made. |
| 5 | ip_pres_time_unc | datetime | | | Yes | NULL | | | Inference time uncertainty |
| 6 | ip_pres_start | datetime | | | Yes | NULL | | | Start time, the time at which the inferred process began |
| 7 | ip_pres_start_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 8 | ip_pres_end | datetime | | | Yes | NULL | | | End time, the time at which the inferred process ended |
| 9 | ip_pres_end_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 10 | ip_pres_gas | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Gas-induced overpressure: Y=Yes, N=No, M=Maybe, U=Unknown |
| 11 | ip_pres_tec | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Magma or tectonically induced overpressure: Y=Yes, N=No, M=Maybe, U=Unknown |
| 12 | ip_pres_ori | enum('D', 'O') | latin1_swedish_ci | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 13 | ip_pres_com | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Comments |
| 14 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 15 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 16 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 17 | ip_pres_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 18 | ip_pres_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 19 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 20 | cb_ids | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|--------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ip_pres_id | A | No | |
| CODE | BTREE | No | No | ip_pres_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|-------|----------|
| vd_id | vd.vd_id |

| | |
|------------|----------|
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

Q.4. ip_sat - Volatile saturation

This table stores information about processes related to volatiles in the magma.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|------------------|--------------------------|-------------------|------------|------|---------|----------------|------|---|
| 1 | ip_sat_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Volatile saturation ID |
| 2 | ip_sat_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Volatile saturation code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano ID |
| 4 | ip_sat_time | datetime | | | Yes | NULL | | | The date and time the inference was made. |
| 5 | ip_sat_time_unc | datetime | | | Yes | NULL | | | Inference time uncertainty |
| 6 | ip_sat_start | datetime | | | Yes | NULL | | | Start time, the time at which the inferred process began |
| 7 | ip_sat_start_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 8 | ip_sat_end | datetime | | | Yes | NULL | | | End time, the time at which the inferred process ended |
| 9 | ip_sat_end_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 10 | ip_sat_co2 | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Magma became saturated with CO2 before an eruption and contributed to preeruption unrest: Y=Yes, N=No, M=Maybe, U=Unknown |
| 11 | ip_sat_h2o | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Magma became saturated with H2O before an eruption: Y=Yes, N=No, M=Maybe, U=Unknown |
| 12 | ip_sat_de-comp | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Volatile saturation by decompression: Y=Yes, N=No, M=Maybe, U=Unknown |
| 13 | ip_sat_dfo2 | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Volatile saturation by a change in f)2 Fugacity: Y=Yes, N=No, M=Maybe, U=Unknown |
| 14 | ip_sat_add | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Volatile saturation by volatile addition: Y=Yes, N=No, M=Maybe, U=Unknown |
| 15 | ip_sat_xtl | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Volatile saturation by Crystallization or second boiling: Y=Yes, N=No, M=Maybe, U=Unknown |
| 16 | ip_sat_ves | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Subsurface, preeruptive increases in vesiculation, thereby decreasing density. Y=Yes, N=No, M=Maybe, U=Unknown |
| 17 | ip_sat_deves | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Subsurface, preeruptive decrease in vesiculation, thereby increasing density: Y=Yes, N=No, M=Maybe, U=Unknown |
| 18 | ip_sat_de-gas | enum('Y', 'N', 'M', 'U') | latin1_swedish_ci | | Yes | NULL | | | Deep and near-surface degassing include gas explosion events: Y=Yes, N=No, M=Maybe, U=Unknown |

| | | | | | | | | | |
|----|-------------------------|---------------|--------------------------|----------|-----|------|--|--|---|
| 19 | ip_sat_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 20 | ip_sat_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 21 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 22 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 23 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 24 | ip_sat_load_date | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 25 | ip_sat_pub-date | datetime | | | Yes | NULL | | | the date the data became public |
| 26 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 27 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ip_sat_id | 0 | A | No | |
| CODE | BTREE | No | No | ip_sat_code | | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

Q.5. ip_tec - Regional tectonics interaction

This table stores information about processes related to regional tectonic events.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|-------------------------|--------------|--------------------------|------------|------|---------|----------------|------|--|
| 1 | ip_tec_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Regional tectonic ID |
| 2 | ip_tec_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Regional tectonic code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano ID |
| 4 | ip_tec_time | datetime | | | Yes | NULL | | | The date and time the inference was made. |
| 5 | ip_tec_time_unc | datetime | | | Yes | NULL | | | Inference time uncertainty |
| 6 | ip_tec_start | datetime | | | Yes | NULL | | | Start time, the time at which the inferred process began |
| 7 | ip_tec_start_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 8 | ip_tec_end | datetime | | | Yes | NULL | | | End time, the time at which the inferred process ended |
| 9 | ip_tec_end_ | datetime | | | Yes | NULL | | | End time uncertainty |

| | unc | | | | | | | | |
|----|------------------------------|--------------------------|-------------------------------|----------|-----|------|--|--|--|
| 10 | ip_tec_chan ge | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Tectonically induced changes in magma/hydrothermal system: Y=Yes, N=No, M=Maybe, U=Unknown |
| 11 | ip_tec_sstre ss | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Changes in static stress after large regional earthquake (include viscoelastic process): Y=Yes, N=No, M=Maybe, U=Unknown |
| 12 | ip_tec_dstr ain | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Dynamic strain, associated with passage of earthquake waves from distal source: Y=Yes, N=No, M=Maybe, U=Unknown |
| 13 | ip_tec_faулт | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Local fault shear or other deformation of the cone: Y=Yes, N=No, M=Maybe, U=Unknown |
| 14 | ip_tec_seq | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Slow earthquake, as recorded by GPS or strain: Y=Yes, N=No, M=Maybe, U=Unknown |
| 15 | ip_tec_pres s | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Pressurization of magma or hydrothermal reservoir located several km (include Distal VT earthquake): Y=Yes, N=No, M=Maybe, U=Unknown |
| 16 | ip_tec_de- press | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Depressurization of magma or hydrothermal reservoir located several km or more(include distal VT): Y=Yes, N=No, M=Maybe, U=Unknown |
| 17 | ip_tec_hp- press | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Increase hydrothermal pore pressures(lubrication) along faults beneath or near the volcano: Y=Yes, N=No, M=Maybe, U=Unknown |
| 18 | ip_tec_etide | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Earth-tide interaction with magma/hydrothermal systems: Y=Yes, N=No, M=Maybe, U=Unknown |
| 19 | ip_tec_atmp | enum('Y', 'N', 'M', 'U') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Interaction of the volcanic system with changes in atmospheric pressure, rainfall, wind, etc.: Y=Yes, N=No, M=Maybe, U=Unknown |
| 20 | ip_tec_ori | enum('D', 'O') | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 21 | ip_tec_com | char(255) | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | Comments |
| 22 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 23 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 24 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 25 | ip_tec_load- date | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 26 | ip_tec_pub- date | datetime | | | Yes | NULL | | | the date the data became public |
| 27 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 28 | cb_ids | varchar(255) | <i>latin1_sw edish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ip_tec_id | A | No | |
| CODE | BTREE | No | No | ip_tec_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

R. Common or Shared

The common or shared tables store data from within the Volcano > Network > Station > Instrument hierarchy that are used by almost all of the monitoring tables.

R.1. cc - Contact

This table provides all of the contact information for a person, observatory, or institution.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|--------------------|--------------|--------------------------|------------|------|---------|----------------|------|-------------------------------|
| 1 | cc_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Contact ID |
| 2 | cc_code | varchar(15) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Contact Code |
| 3 | cc_code2 | varchar(15) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Contact Code alias |
| 4 | cc_fname | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | First name |
| 5 | cc_lname | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Last name |
| 6 | cc_obs | varchar(150) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Observatory |
| 7 | cc_add1 | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Address 1 |
| 8 | cc_add2 | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Address 2 |
| 9 | cc_city | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | City |
| 10 | cc_state | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | State |
| 11 | cc_country | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Country |
| 12 | cc_post | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Postal code |
| 13 | cc_url | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Web address |
| 14 | cc_email | varchar(320) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Email |
| 15 | cc_phone | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Phone |
| 16 | cc_phone2 | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Phone 2 |
| 17 | cc_fax | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Fax |
| 18 | cc_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 19 | cc_loaddate | datetime | | | Yes | NULL | | | the date the data was entered |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|----------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cc_id | A | No | |
| CODE | BTREE | Yes | No | cc_code | A | Yes | |
| CODE2 | BTREE | Yes | No | cc_code2 | A | Yes | |

R.2. cb - Bibliographic

This table stores information about articles, papers, books, and web sites, with information that is related to the data in WOVOdat.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|-----------------|--------------|--------------------------|------------|------|---------|----------------|------|------------------|
| 1 | cb_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Bibliographic ID |
| 2 | cb_auth | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Authors/Editors |
| 3 | cb_year | year(4) | | | Yes | NULL | | | Publication year |
| 4 | cb_title | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Title |
| 5 | cb_journ | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Journal |
| 6 | cb_vol | varchar(20) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Volume |

| | | | | | | | | | |
|----|--------------------|--------------|--------------------------|----------|-----|------|--|--|--|
| 7 | cb_pub | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Publisher |
| 8 | cb_page | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Pages |
| 9 | cb_doi | varchar(20) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Digital Object Identifier |
| 10 | cb_isbn | varchar(13) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | International Standard Book Number |
| 11 | cb_url | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Info on the web |
| 12 | cb_labadr | varchar(320) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Email address of observatory |
| 13 | cb_keywords | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Keywords |
| 14 | cb_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 15 | cb_loaddate | datetime | | | Yes | NULL | | | the date the data was entered |
| 16 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|--------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cb_id | A | No | |

Links

| Field | Link to |
|------------|----------|
| cc_id_load | cc.cc_id |

R.3. co - Observation

This table provides storage for observations about volcanic activity.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|---------------------|--------------|--------------------------|------------|------|---------|----------------|------|---|
| 1 | co_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | Observation ID |
| 2 | co_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Observation Code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano ID |
| 4 | co_observe | text | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 5 | co_stime | datetime | | | Yes | NULL | | | Start time |
| 6 | co_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 7 | co_etime | datetime | | | Yes | NULL | | | End time |
| 8 | co_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 9 | co_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 10 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 11 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 12 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 13 | co_loaddate | datetime | | | Yes | NULL | | | the date the data was entered |
| 14 | co_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 15 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 16 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | co_id | A | No | |
| CODE | BTREE | No | No | co_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

R.4. cm - Image

This table stores images that support other WOVODat data.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|----------------------------------|---------------|--------------------------|------------|------|---------|----------------|------|---|
| 1 | cm_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Image ID |
| 2 | cm_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Image Code |
| 3 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano ID |
| 4 | cm_lat | double | | | Yes | NULL | | | Latitude |
| 5 | cm_lon | double | | | Yes | NULL | | | Longitude |
| 6 | cm_location | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Location |
| 7 | cm_descriptio n | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description (including the scale) |
| 8 | cm_format | varchar(10) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Image format |
| 9 | cm_date | datetime | | | Yes | NULL | | | Date |
| 10 | cm_date_unc | datetime | | | Yes | NULL | | | Date uncertainty |
| 11 | cm_image | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Link/path where the image store |
| 12 | cm_usage | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Usage of image (copyright) |
| 13 | cm_keywords | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Keywords (for searches) |
| 14 | cm_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D=digitized, O= original from observatory |
| 15 | cm_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 16 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 17 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 18 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 19 | cm_loaddate | datetime | | | Yes | NULL | | | the date the data was entered |
| 20 | cm_pubdate | datetime | | | Yes | NULL | | | the date the data become public |
| 21 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person |

| | | | | | | | | | |
|----|--------|--------------|-------------------|--|-----|------|--|--|---|
| | | | | | | | | | who entered the data |
| 22 | cb_ids | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cm_id | A | No | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| CODE | BTREE | No | No | cm_code | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| VOLCANO | BTREE | No | No | vd_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

R.5. md - Map

This table stores information about maps that cover areas where WOVOdat data is collected.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|--------------|--------------|-------------------|------------|------|---------|----------------|------|---|
| 1 | md_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Map ID |
| 2 | md_code | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Map Code |
| 3 | vd_id | mediumint(8) | | | Yes | NULL | | | Volcano ID |
| 4 | md_name | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Map Name |
| 5 | md_type | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Map Type (topo, DEM, etc.) |
| 6 | md_srtm | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Link to DEM stored on the WOVOdat server. |
| 7 | md_scale | varchar(30) | latin1_swedish_ci | | Yes | NULL | | | Scale of the map |
| 8 | md_contour | float | | | Yes | NULL | m | | Contour interval |
| 9 | md_date | date | | | Yes | NULL | | | Publication date |
| 10 | md_date_unc | date | | | Yes | NULL | | | Publication date uncertainty |
| 11 | md_proj | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Projection |
| 12 | mp_map_datum | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Datum |
| 13 | md_west | float | | | Yes | NULL | ° | | West bounding coordinate |
| 14 | md_east | float | | | Yes | NULL | ° | | East bounding coordinate |
| 15 | md_north | float | | | Yes | NULL | ° | | North bounding coordinate |
| 16 | md_south | float | | | Yes | NULL | ° | | South bounding coordinate |
| 17 | md_elev_max | float | | | Yes | NULL | m | | Maximum elevation |
| 18 | md_elev_min | float | | | Yes | NULL | m | | Minimum elevation |
| 19 | md_use | varchar(255) | latin1_swedish_ci | | Yes | NULL | | | Intended use of the map |

| | | | | | | | | | |
|----|------------------------|---------------|--------------------------|----------|-----|------|--|--|---|
| | | | <i>i</i> | | | | | | |
| 20 | md_restrictions | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Restrictions on the use |
| 21 | md_quality | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Quality of the map |
| 22 | md_image | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Link to image |
| 23 | md_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| 24 | md_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | A flag for source of data. D =digitized, O = original from observatory |
| 25 | md_com | char(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 26 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 27 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 28 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 29 | md_loaddate | datetime | | | Yes | NULL | | | the date the data was entered |
| 30 | md_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 31 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 32 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

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| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|----------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | med_id | A | No | |
| CODE | BTREE | No | No | med_code | A | Yes | |
| OWNER 1 | BTREE | No | No | cc_id | A | Yes | |
| OWNER 2 | BTREE | No | No | cc_id2 | A | Yes | |
| OWNER 3 | BTREE | No | No | cc_id3 | A | Yes | |
| STATION | BTREE | No | No | ms_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id2 | cc.cc_id |
| cc_id3 | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

R.6. cs - Satellite/Airplane

This table stores information about satellites and airplanes that are used for collecting data from above the surface of the earth.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|----------------|---------------|--------------------------|------------|------|---------|----------------|------|-------------------------|
| 1 | cs_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Satellite/airplane ID |
| 2 | cs_code | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Satellite/airplane code |
| 3 | cs_type | enum('S','A') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Type (A=Airplane, |

| | | | | | | | | | |
|----|---------------------|---------------|--------------------------|----------|-----|---------------------|--|--|---|
| | | | | | | | | | S=Satellite) |
| 4 | cs_name | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Satellite/airplane name |
| 5 | cs_stime | datetime | | | No | 0000-00-00 00:00:00 | | | Start time |
| 6 | cs_stime_unc | datetime | | | Yes | NULL | | | Start time uncertainty |
| 7 | cs_etime | datetime | | | No | 9999-12-31 23:59:59 | | | End time |
| 8 | cs_etime_unc | datetime | | | Yes | NULL | | | End time uncertainty |
| 9 | cs_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description |
| | | | | | | | | | A flag for source of data. D=digitized, O= original from observatory |
| 10 | cs_ori | enum('D','O') | <i>latin1_swedish_ci</i> | | Yes | NULL | | | |
| 11 | cs_com | char(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments |
| 12 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | First owner ID |
| 13 | cc_id2 | smallint(5) | | UNSIGNED | Yes | NULL | | | Second owner ID |
| 14 | cc_id3 | smallint(5) | | UNSIGNED | Yes | NULL | | | Third owner ID |
| 15 | cs_loaddate | datetime | | | Yes | NULL | | | the date the data was entered |
| 16 | cs_pubdate | datetime | | | Yes | NULL | | | the date the data became public |
| 17 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |
| 18 | cb_ids | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | List of cb_ids, link to bibliography table (cb), separated by a comma |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------|-------|--------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cb_id | 56 | A | No | |

Links

| Field | Link to |
|------------|----------|
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

R.7. st_eqt – Earthquake translation

The Earthquake Translation table (st_eqt, for Seismic Translation - Earthquake Types) allows users to translate an earthquake type defined by one observatory to the WOVOdat earthquake type. Some observatories refer to different earthquake types by the same name or similar earthquake types by different names.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|-------------------------|--------------|--------------------------|------------|------|---------|----------------|------|--|
| 1 | st_eqt_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Earthquake translation identifier |
| 2 | st_eqt_wovo | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | WOVOdat terminology |
| 3 | st_eqt_org | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Original terminology used by the observatory |
| 3 | st_eqt_name | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Earthquake name |
| 4 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Owner identifier |
| 5 | st_eqt_load-date | datetime | <i>latin1_swedish_ci</i> | | Yes | NULL | | | the date the data was entered (in UTC) |
| 6 | cc_id_load | smallint(5) | <i>latin1_swedish_ci</i> | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

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| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|------------------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | st_eqt_id | A | No | |
| USER TRANSLATION | BTREE | Yes | No | st_eqt_wovo | A | Yes | |
| | | | | cc_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cc_id | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

S. SYSTEM

S.1. jj_concon - User to user permissions

This table stores information about the permissions (upload, update, view their data or manage their account) given by a user to another.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|--------------------|--------------|-----------|------------|------|---------|----------------|------|--|
| 1 | jj_concon_id | mediumint(8) | | UNSIGNED | No | None | AUTO_INCREMENT | | User to user permission ID |
| 2 | cc_id | smallint(5) | | UNSIGNED | No | None | | | Granting user ID (granted) |
| 3 | cc_id_granted | smallint(5) | | UNSIGNED | No | None | | | Granted user ID |
| 4 | jj_concon_view | tinyint(1) | | | No | 0 | | | Permission to view unpublished data: 0=No, 1=Yes |
| 5 | jj_concon_upload | tinyint(1) | | | No | 0 | | | Permission to upload data: 0=No, 1=Yes |
| 6 | jj_concon_update | tinyint(1) | | | No | 0 | | | Permission to update data: 0=No, 1=Yes |
| 7 | jj_concon_admin | tinyint(1) | | | No | 0 | | | Permission to manage account: 0=No, 1=Yes |
| 8 | jj_concon_loaddate | datetime | | | Yes | NULL | | | the date the data was entered (in UTC) |
| 9 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|---------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | jj_concon_id | A | No | |
| GRANT | BTREE | Yes | No | cc_id | A | No | |
| | | | | cc_id_granted | A | No | |

Links

| Field | Link to |
|---------------|----------|
| cc_id | cc.cc_id |
| cc_id_granted | cc.cc_id |
| cc_id_load | cc.cc_id |
| cb_ids | cb.cb_id |

S.2. jj_imgx - Image junction

This table was created to link images to other known data.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|------------|--|-----------|------------|------|---------|----------------|------|---|
| 1 | jj_imgx_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Image junction ID |
| 2 | cm_id | smallint(5) | | UNSIGNED | No | None | | | Image ID |
| 3 | jj_idname | enum('cb', 'cc', 'ch', 'cm', 'cn', 'co', 'cp', 'cr', 'cr_tmp', 'cs', 'cu', 'dd_ang', 'dd_edm', 'dd_gps', 'dd_gpv', 'dd_lev', 'dd_sar', 'dd_srd', 'dd_str', 'dd_tlt', 'dd_tlv', 'di_gen', 'di_tlt', 'ds', 'ed', 'ed_for', 'ed_phs', 'ed_vid', 'fd_ele', 'fd_gra', 'fd_mag', 'fd_mgv', | | | Yes | NULL | | | The name of the other table of interest |

| | | | | | | | | |
|---|--------------------------|--|--|----------|-----|------|--|--|
| | | 'fi', 'fs', 'gd', 'gd_plu', 'gd_sol', 'gi', 'gs', 'hd', 'hi', 'hs', 'ip_hyd', 'ip_mag', 'ip_pres', 'ip_sat', 'ip_tec', 'jj_concon', 'jj_imgx', 'jj_volcon', 'jj_volnet', 'j_sarsat', 'md', 'sd_evn', 'sd_evs', 'sd_int', 'sd_ivl', 'sd_rsm', 'sd_sam', 'sd_ssm', 'sd_trm', 'sd_wav', 'si', 'si_cmp', 'sn', 'ss', 'st_eqt', 'td', 'td_img', 'td_pix', 'ti', 'ts', 'vd', 'vd_inf', 'vd_mag', 'vd_tec') | | | | | | |
| 4 | jj_x_id | mediumint(8) | | UNSIGNED | Yes | NULL | | Linking table ID |
| 5 | jj_imgx_load_date | datetime | | | Yes | NULL | | the date the data was entered |
| 6 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | jj_imgx_id | A | No | |
| LINK | BTREE | Yes | No | cm_id | A | No | |
| | | | | jj_idname | A | Yes | |
| | | | | jj_x_id | A | Yes | |

Links

| Field | Link to |
|------------|------------------------|
| cm_id | cm.cm_id |
| jj_x_id | jj_idname.jj_idname_id |
| cc_id_load | cc.cc_id |

S.3. jj_volcon - Volcano-contact junction

This table was created for the many-to-many relationship between the volcano and the observatories that monitor the volcano.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|---------------------------|--------------|-----------|------------|------|---------|----------------|------|--|
| 1 | jj_volcon_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Volcano-contact junction ID |
| 2 | vd_id | mediumint(8) | | UNSIGNED | No | None | | | Volcano ID |
| 3 | cc_id | smallint(5) | | | Yes | NULL | | | User/Owner ID |
| 4 | jj_volcon_loaddate | datetime | | UNSIGNED | Yes | NULL | | | the date the data was entered |
| 5 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|--------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | jj_volcon_id | A | No | |
| LINK | BTREE | Yes | No | vd_id | A | No | |
| | | | | cc_id | A | No | |
| | | | | | | | |

Links

| Field | Link to |
|------------|----------|
| vd_id | vd.vd_id |
| cc_id | cc.cc_id |
| cc_id_load | cc.cc_id |

S.4. jj_volnet - Volcano-network junction

This table was created for the many-to-many relationship between the volcano and the observatories that monitor the volcano.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|---------------------------|----------------|-------------------|------------|------|---------|----------------|------|--|
| 1 | jj_volnet_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Volcano-network junction ID |
| 2 | vd_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | Volcano ID |
| 3 | jj_net_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Network ID |
| 4 | jj_net_flag | enum('C', 'S') | latin1_swedish_ci | | Yes | NULL | | | Network type: C=Common, S=Seismic |
| 5 | jj_volnet_loaddate | datetime | | | Yes | NULL | | | the date the data was entered |
| 6 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------------|-------|--------|--------|--------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | jj_volnet_id | A | No | |
| LINK | BTREE | Yes | No | vd_id | A | Yes | |
| | | | | jj_net_id | A | Yes | |
| | | | | jj_net_flag | A | Yes | |
| jj_volnet_id | BTREE | No | No | jj_volnet_id | A | No | |
| jj_volnet_id_2 | BTREE | No | No | jj_volnet_id | A | No | |

Links

| Field | Link to |
|------------|----------------------------|
| vd_id | vd.vd_id |
| jj_net_id | jj_net_flag.jj_net_flag_id |
| cc_id_load | cc.cc_id |

S.5. j_sarsat - InSAR-satellite junction

This table was created for the many-to-many relationship between the satellite data and the InSAR data.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|--------------------------|--------------|-----------|------------|------|---------|----------------|------|--|
| 1 | j_sarsat_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | InSAR-satellite junction ID |
| 2 | dd_sar_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | InSAR image ID |
| 3 | cs_id | smallint(5) | | UNSIGNED | Yes | NULL | | | Satellite ID |
| 4 | j_sarsat_loaddate | datetime | | | Yes | NULL | | | the date the data was entered |
| 5 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | j_sarsat_id | A | No | |
| LINK | BTREE | Yes | No | dd_sar_id | A | Yes | |
| | | | | cs_id | A | Yes | |

Links

| Field | Link to |
|------------|------------------|
| dd_sar_id | dd_sar.dd_sar_id |
| cs_id | cs.cs_id |
| cc_id_load | cc.cc_id |

Database Administration:

S.6. cr - Registry

This table provides username and password information for people who registered to WOVOdat.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|-------------------|-------------|--------------------------|------------|------|---------|----------------|------|--------------------|
| 1 | cr_id | tinyint(3) | | UNSIGNED | No | None | AUTO_INCREMENT | | Registry ID |
| 2 | cc_id | smallint(5) | | UNSIGNED | Yes | NULL | | | User ID |
| 3 | cr_uname | varchar(30) | <i>latin1_swedish_ci</i> | | No | None | | | Username for login |
| 4 | cr_pwd | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Password for login |
| 5 | cr_regdate | datetime | | | Yes | NULL | | | Registration date |
| 6 | cr_update | datetime | | | Yes | NULL | | | Last update |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------|-------|--------|--------|----------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cr_id | A | No | |
| USERNAME | BTREE | Yes | No | cr_uname | A | No | |
| CONTACT | BTREE | Yes | No | cc_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cc_id_load | cc.cc_id |

S.7. cr_tmp - Temporary registry

This table stores information about users who wish to register to WOVOdat while waiting for them to confirm registration by clicking the link provided in a confirmation email.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|----|-----------------------|--------------|--------------------------|------------|------|---------|----------------|------|-----------------------------|
| 1 | cr_tmp_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Temporary registry ID |
| 2 | cr_tmp_time | datetime | | | No | None | | | Time when the registry made |
| 3 | cr_tmp_email | varchar(320) | <i>latin1_swedish_ci</i> | | No | None | | | Email |
| 4 | cr_tmp_fname | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | First name |
| 5 | cr_tmp_lname | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Last name |
| 6 | cr_tmp_obs | varchar(150) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Observatory |
| 7 | cr_tmp_add1 | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Address 1 |
| 8 | cr_tmp_add2 | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Address 2 |
| 9 | cr_tmp_city | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | City |
| 10 | cr_tmp_state | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | State/Province |
| 11 | cr_tmp_country | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Country |
| 12 | cr_tmp_post | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Postal code |
| 13 | cr_tmp_url | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Web address |

| | | | | | | | | | |
|----|----------------------|--------------|--------------------------|--|-----|-------------|--|--|----------|
| | | | <i>i</i> | | | | | | |
| 14 | cr_tmp_phone | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | Phone |
| 15 | cr_tmp_phone2 | varchar(50) | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | Phone 2 |
| 16 | cr_tmp_fax | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | Fax |
| 17 | cr_tmp_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | Comments |
| 18 | cr_tmp_uname | varchar(30) | <i>latin1_swedish_ci</i> | | No | <i>None</i> | | | Username |
| 19 | cr_tmp_pwd | varchar(60) | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | Password |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|----------|-------|--------|--------|--------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cr_tmp_id | A | No | |
| USERNAME | BTREE | Yes | No | cr_tmp_uname | A | No | |

S.8. cp - Permission

This table provides the access information for each registered user.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|-------------------|---|--------------------------|------------|------|-------------|----------------|------|--|
| | cp_id | tinyint(3) | | UNSIGNED | No | <i>None</i> | AUTO_INCREMENT | | Permission ID |
| 2 | cr_id | tinyint(3) | | UNSIGNED | Yes | <i>NULL</i> | | | Registry ID |
| 3 | cp_access | enum('0','1','2','3','4','5','6','7','8','9') | | | No | 9 | | | Access level: 0=Developer, 9=Minimum access |
| 4 | cp_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | Comments |
| 5 | cc_id_load | smallint(5) | | UNSIGNED | Yes | <i>NULL</i> | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|-----------------|-------|--------|--------|--------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cp_id | A | No | |
| REGISTERED USER | BTREE | Yes | No | cr_id | A | Yes | |

Links

| Field | Link to |
|------------|----------|
| cr_id | cr.cr_id |
| cc_id_load | cc.cc_id |

S.9. cu - Upload history

This table stores information about all uploads made to the database, including those which failed.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments |
|---|----------------|-------------------------------|--------------------------|------------|------|-------------|----------------|------|--|
| 1 | cu_id | mediumint(8) | | UNSIGNED | No | <i>None</i> | AUTO_INCREMENT | | Upload history ID |
| 2 | cu_file | varchar(255) | <i>latin1_swedish_ci</i> | | No | <i>None</i> | | | Original uploaded file name |
| 3 | cu_type | enum('P','PE','TBP','T','TE') | <i>latin1_swedish_ci</i> | | Yes | <i>NULL</i> | | | Type of upload: I=In database, N=Not in database (test), |

| | | | | | | | | | |
|---|--------------------|------------------|-------------------------------------|----------|-----|------|--|--|--|
| | | 'TBT', 'U', 'O') | | | | | | | U=Undone, T=Temporary (to be treated later), W=translated to WOVOML , F=Failed |
| 4 | cu_com | text | <i>latin1_swed</i> <i>ish_ci</i> | | Yes | NULL | | | Comments or error message |
| 5 | cu_loaddate | datetime | | | Yes | NULL | | | the date the data was entered |
| 6 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------|-------|--------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | cu_id | 19951 | A | No | |

Links

| Field | Link to |
|------------|----------|
| cc_id_load | cc.cc_id |

S.10. ch - Change

This table stores information about any changes that have been made in the database.

| # | Column | Type | Collation | Attributes | Null | Default | Extra | Unit | Comments | |
|---|--------------------|---|--------------------------|------------|------|---------|----------------|------|--|---|
| 1 | ch_id | smallint(5) | | UNSIGNED | No | None | AUTO_INCREMENT | | Change ID | |
| 2 | ch_linkname | enum('cb', 'cc', 'ch', 'cm', 'cn', 'co', 'cp', 'cr', 'cr_tmp', 'cs', 'cu', 'dd_ang', 'dd_edm', 'dd_gps', 'dd_gpv', 'dd_lev', 'dd_sar', 'dd_srd', 'dd_str', 'dd_tlt', 'dd_tlv', 'di_gen', 'di_tlt', 'ds', 'ed', 'ed_for', 'ed_phs', 'ed_vid', 'fd_ele', 'fd_gra', 'fd_mag', 'fd_mgv', 'fi', 'fs', 'gd', 'gd_plu', 'gd_sol', 'gi', 'gs', 'hd', 'hi', 'hs', 'ip_hyd', 'ip_mag', 'ip_pres', 'ip_sat', 'ip_tec', 'jj_concon', 'jj_imgx', 'jj_volcon', 'jj_volnet', 'j_sarsat', 'md', 'sd_evn', 'sd_evs', 'sd_int', 'sd_ivl', 'sd_rsm', 'sd_sam', 'sd_ssm', 'sd_trm', 'sd_wav', 'si', 'si_cmp', 'sn', 'ss', 'st_eqt', 'td', 'td_img', 'td_pix', 'ti', 'ts', 'vd', 'vd_inf', 'vd_mag', 'vd_tec') | | | | | | | | The name of the table where the change has been made. |
| 3 | ch_link_id | mediumint(8) | | UNSIGNED | Yes | NULL | | | The ID-number of the set of data where the change has been made. | |
| 4 | ch_atname | varchar(30) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Field/attribute name where the change has been made | |
| 5 | ch_desc | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Description | |
| 6 | ch_com | varchar(255) | <i>latin1_swedish_ci</i> | | Yes | NULL | | | Comments | |
| 7 | ch_loaddate | datetime | | | Yes | NULL | | | the date the data was entered | |
| 8 | cc_id_load | smallint(5) | | UNSIGNED | Yes | NULL | | | contact ID for the person who entered the data | |

Indexes

| Keyname | Type | Unique | Packed | Column | Collation | Null | Comment |
|---------|-------|--------|--------|--------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | ch_id | A | No | |

Links

| Field | Link to |
|------------|----------|
| cc_id_load | cc.cc_id |

NOTE

- 1.element of the table that highlighted by light-gray shade: filled automatically by the system when the data uploaded
- 2.element written in “**red**”: link to other table
- 3.Standard datetime format: **YYYY-MM-DD HH:MM:SS.SS** (in UTC)
- 4.Standard origin time format: **YYYY-MM-DD HH:MM:SS** (in UTC)

Appendix-1 WOVOdat XML-format

WOVOdat XML template

Class, attributes, and elements

```
<?xml version="1.0" encoding="UTF-8"?>
<wovoml owner1="..." owner2="..." owner3="..." pubDate="..." v="..." version="..." xmlns="http://www.wovodat.org"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wovodat.org wovoml_schema.xsd ">
    <Observations>...</Observations>
    <InferredProcesses>...</InferredProcesses>
    <Eruptions>...</Eruptions>
    <MonitoringSystems>...</MonitoringSystems>
    <Data>...</Data>
</wovoml>
```

Observations: This class contains information for observations about volcanic activity.

```
<?xml version="1.0" encoding="UTF-8"?>
<wovoml owner1="..." owner2="..." owner3="..." pubDate="..." v="..." version="..." xmlns="http://www.wovodat.org"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wovodat.org
wovoml_schema.xsd ">

<Observations owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <Observation code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        <description>description</description>
        <startTime>YYYY-MM-DD HH:MM:SS</startTime>
        <startTimeUnc>startTimeUnc</startTimeUnc>
        <endTime>endTime</endTime>
        <endTimeUnc>endTimeUnc</endTimeUnc>
    </Observation>
</Observations>
```

Inferred Processes: This class contains information about historical (in most cases, published) inferences about processes causing volcanic unrest.

```
<InferredProcesses owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <MagmaMovement code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="..." volcano="...">
        ...
    </MagmaMovement>
    <VolatileSat code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
    </VolatileSat>
    <MagmaPressure code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
    </MagmaPressure>
    <Hydrothermal code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
    </Hydrothermal>
    <RegionalTectonics code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="..." volcano="...">
        ...
    </RegionalTectonics>
</InferredProcesses>
```

Eruption: This class contains information about volcano eruption.

```
<Eruptions owner1="..." owner2="..." owner3="..." pubDate="..." v="..." volcano="...">
    <Eruption code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="..." volcano="...">
        ...
        <Video code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
        </Video>
        <Phase code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
            <Video code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
                ...
            </Video>
            <Forecast code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
                ...
            </Forecast>
        </Phase>
    </Eruption>
    <Phases eruption="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        <Phase code="..." eruption="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
            <Video code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
                ...
            </Video>
            <Forecast code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
                ...
            </Forecast>
        </Phase>
    </Phases>
    <Video code="..." eruption="..." owner1="..." owner2="..." owner3="..." phase="..." pubDate="..." v="..." volcano="...">
        ...
    </Video>
    <Forecast code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="..." volcano="...">
        ...
    </Forecast>
</Eruptions>
```

Monitoring system: This class contains information about all monitoring systems (network, stations, instruments, components) in a volcano.

```
<MonitoringSystems owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <Airplane code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <GasInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        </GasInstrument>
        <ThermalInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        </ThermalInstrument>
    </Airplane>

<DeformationNetwork code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <Volcanoes>
        <volcanoCode>volcanoCode</volcanoCode>
    </Volcanoes>
    <DeformationStation code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <DeformationInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        </DeformationInstrument>
        <TiltStrainInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        </TiltStrainInstrument>
    </DeformationStation>
</DeformationNetwork>
<DeformationStations network="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <DeformationStation code="..." network="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <DeformationInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        </DeformationInstrument>
        <TiltStrainInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        </TiltStrainInstrument>
    </DeformationStation>
</DeformationStations>
<DeformationInstruments owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
    <DeformationInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
    ...
    </DeformationInstrument>
    <TiltStrainInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    ...
    </TiltStrainInstrument>
</DeformationInstruments>
```

```

<GasNetwork code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <Volcanoes>
        <volcanoCode>volcanoCode</volcanoCode>
    </Volcanoes>
    <GasStation code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <GasInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
        </GasInstrument>
    </GasStation>
</GasNetwork>
<GasStations network="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <GasStation code="..." network="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <GasInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
        </GasInstrument>
    </GasStation>
</GasStations>
<GasInstruments airplane="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
    <GasInstrument airplane="..." code="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
        ...
    </GasInstrument>
</GasInstruments>

```

```

<FieldsNetwork code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <Volcanoes>
        <volcanoCode>volcanoCode</volcanoCode>
    </Volcanoes>
    <FieldsStation code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <FieldsInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
        </FieldsInstrument>
    </FieldsStation>
</FieldsNetwork>
<FieldsStations network="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <FieldsStation code="..." network="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <FieldsInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
        </FieldsInstrument>
    </FieldsStation>
</FieldsStations>
<FieldsInstruments owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
    <FieldsInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
        ...
    </FieldsInstrument>
</FieldsInstruments>

```

```

<ThermalNetwork code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <Volcanoes>
        <volcanoCode>volcanoCode</volcanoCode>
    </Volcanoes>
    <ThermalStation code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <ThermalInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
        </ThermalInstrument>
    </ThermalStation>
</ThermalNetwork>
<ThermalStations network="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <ThermalStation code="..." network="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <ThermalInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
        </ThermalInstrument>
    </ThermalStation>
</ThermalStations>
<ThermalInstruments airplane="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
    <ThermalInstrument airplane="..." code="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
        ...
    </ThermalInstrument>
</ThermalInstruments>

<SeismicNetwork code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <Volcanoes>
        <volcanoCode>volcanoCode</volcanoCode>
    </Volcanoes>
    <SeismicStation code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <SeismicInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
            <SeismicComponent code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
                ...
            </SeismicComponent>
        </SeismicInstrument>
    </SeismicStation>
</SeismicNetwork>
<SeismicStations network="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <SeismicStation code="..." network="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
        <SeismicInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
            <SeismicComponent code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
                ...
            </SeismicComponent>
        </SeismicInstrument>
    </SeismicStation>
</SeismicStations>
<SeismicInstruments owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
    <SeismicInstrument code="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
        ...
        <SeismicComponent code="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
            ...
        </SeismicComponent>
    </SeismicInstrument>
</SeismicInstruments>
<SeismicComponents instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <SeismicComponent code="..." instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
        ...
    </SeismicComponent>
</SeismicComponents>

</MonitoringSystems>

```

Data: This class contains information about all type of volcano monitoring data obtained/recoded by "Monitoring system".

```

<Data>
  <Deformation owner1="..." owner2="..." owner3="..." pubDate="..." v="...">
    <ElectronicTiltDataset instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
      <ElectronicTilt code="..." instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
        ...
      </ElectronicTilt>
    </ElectronicTiltDataset>
    <TiltVectorDataset instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
      <TiltVector code="..." instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
        ...
      </TiltVector>
    </TiltVectorDataset>
    <StrainDataset instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
      <Strain code="..." instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
        ...
      </Strain>
    </StrainDataset>
    <EDMDataset instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." targetStation="..." v="...">
      <EDM code="..." instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." targetStation="..." v="...">
        ...
      </EDM>
    </EDMDataset>
    <AngleDataset instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." targetStation1="..." targetStation2="..." v="...">
      <Angle code="..." instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." targetStation1="..." targetStation2="..." v="...">
        ...
      </Angle>
    </AngleDataset>
    <GPSSdataset instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." refStation1="..." refStation2="..." station="..." v="...">
      <GPS code="..." instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." refStation1="..." refStation2="..." station="..." v="...">
        ...
      </GPS>
    </GPSSdataset>
    <GPSVectorDataset instrument="..." owner1="..." owner2="..." owner3="..." pubDate="..." station="..." v="...">
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WOVOdat XML-format (version: July 2013)

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</wovoml>
```

Appendix-2 WOVOML 1.1.0 Schema

WOVOMl_schema.xsd (version: July 2013)

```
<?xml version="1.0" encoding="utf-8" ?>
<xss:schema xmlns:xss="http://www.w3.org/2001/XMLSchema" targetNamespace="http://www.wovodat.org" xmlns="http://www.wovodat.org"
elementFormDefault="qualified">

    <!-- ===== -->
    <!-- Comments on this XSD file -->
    <!-- ===== -->

    <xss:annotation>
        <xss:documentation xml:lang="en">
            WOVOML schema for uploading data to WOVOdat (www.wovodat.org).
            Version 1.1.0
            Last update: October 2012.
            For more information on how to use WOVOML, please refer to: www.wovodat.org/doc
        </xss:documentation>
    </xss:annotation>

    <!-- ===== -->
    <!-- Simple types -->
    <!-- ===== -->

    <!-- Decimal 2,2 -->
    <xss:simpleType name="decimal">
        <xss:restriction base="xss:decimal">
            <xss:minExclusive value="-0.991"/>
            <xss:maxExclusive value="0.991"/>
        </xss:restriction>
    </xss:simpleType>

    <!-- Double without NaN -Inf +Inf -->
    <xss:simpleType name="double">
        <xss:restriction base="xss:double">
            <xss:minExclusive value="-INF"/>
            <xss:maxExclusive value="INF"/>
        </xss:restriction>
    </xss:simpleType>

    <!-- Float without NaN -Inf +Inf -->
    <xss:simpleType name="float">
        <xss:restriction base="xss:float">
            <xss:minExclusive value="-INF"/>
            <xss:maxExclusive value="INF"/>
        </xss:restriction>
    </xss:simpleType>

    <!-- String 10 -->
    <xss:simpleType name="string10">
        <xss:restriction base="xss:string">
            <xss:whiteSpace value="collapse"/>
            <xss:maxLength value="10"/>
        </xss:restriction>
    </xss:simpleType>

    <!-- String 15 -->
    <xss:simpleType name="string15NE">
        <xss:restriction base="xss:string">
            <xss:whiteSpace value="collapse"/>
        </xss:restriction>
    </xss:simpleType>
```

```

        <xs:minLength value="1"/>
        <xsmaxLength value="15"/>
    </xs:restriction>
</xs:simpleType>

<!-- String 12 -->
<xs:simpleType name="string12">
    <xs:restriction base="xs:string">
        <xs:whiteSpace value="collapse"/>
        <xs:minLength value="12"/>
    </xs:restriction>
</xs:simpleType>

<!-- String 12 (non-empty) -->
<xs:simpleType name="string12NE">
    <xs:restriction base="xs:string">
        <xs:whiteSpace value="collapse"/>
        <xs:minLength value="1"/>
        <xs:maxLength value="12"/>
    </xs:restriction>
</xs:simpleType>

<!-- String 30 -->
<xs:simpleType name="string30">
    <xs:restriction base="xs:string">
        <xs:whiteSpace value="collapse"/>
        <xs:minLength value="30"/>
    </xs:restriction>
</xs:simpleType>

<!-- String 30 (non-empty) -->
<xs:simpleType name="string30NE">
    <xs:restriction base="xs:string">
        <xs:whiteSpace value="collapse"/>
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        <xs:maxLength value="30"/>
    </xs:restriction>
</xs:simpleType>

<!-- String 50 -->
<xs:simpleType name="string50">
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    </xs:restriction>
</xs:simpleType>

<!-- String 60 -->
<xs:simpleType name="string60">
    <xs:restriction base="xs:string">
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        <xs:maxLength value="60"/>
    </xs:restriction>
</xs:simpleType>

<!-- String 255 -->
<xs:simpleType name="string255">
    <xs:restriction base="xs:string">
        <xs:whiteSpace value="collapse"/>
        <xs:maxLength value="255"/>
    </xs:restriction>
</xs:simpleType>
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```

<!-- String 255 (non-empty) -->
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    <xs:maxLength value="255"/>
  </xs:restriction>
</xs:simpleType>

<!-- String 511 -->
<xs:simpleType name="string511">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:maxLength value="511"/>
  </xs:restriction>
</xs:simpleType>

<!-- Degrees 0-90 -->
<xs:simpleType name="deg0-90">
  <xs:restriction base="xs:double">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="90"/>
  </xs:restriction>
</xs:simpleType>

<!-- Degrees 0-360 -->
<xs:simpleType name="deg0-360">
  <xs:restriction base="xs:double">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="360"/>
  </xs:restriction>
</xs:simpleType>

<!-- Degrees -90 +90 -->
<xs:simpleType name="deg-90-90">
  <xs:restriction base="xs:double">
    <xs:minInclusive value="-90"/>
    <xs:maxInclusive value="90"/>
  </xs:restriction>
</xs:simpleType>

<!-- Degrees -180 +180 -->
<xs:simpleType name="deg-180-180">
  <xs:restriction base="xs:double">
    <xs:minInclusive value="-180"/>
    <xs:maxInclusive value="180"/>
  </xs:restriction>
</xs:simpleType>

<!-- Yes No enumeration -->
<xs:simpleType name="yesNoEnum">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:enumeration value="Y"/>
    <xs:enumeration value="N"/>
  </xs:restriction>
</xs:simpleType>

<!-- Success enumeration -->
<xs:simpleType name="successEnum">
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```

```

        <xs:enumeration value="N"/>
        <xs:enumeration value="P"/>
    </xs:restriction>
</xs:simpleType>


<xs:simpleType name="yesNoUnkEnum">
    <xs:restriction base="xs:string">
        <xs:whiteSpace value="collapse"/>
        <xs:enumeration value="Y"/>
        <xs:enumeration value="N"/>
        <xs:enumeration value="U"/>
    </xs:restriction>
</xs:simpleType>


<xs:simpleType name="yesNoMaybeUnkEnum">
    <xs:restriction base="xs:string">
        <xs:whiteSpace value="collapse"/>
        <xs:enumeration value="Y"/>
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        <xs:enumeration value="M"/>
        <xs:enumeration value="U"/>
    </xs:restriction>
</xs:simpleType>


<xs:simpleType name="permCampEnum">
    <xs:restriction base="xs:string">
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        <xs:enumeration value="C"/>
    </xs:restriction>
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<xs:simpleType name="contPeriodEnum">
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<xs:simpleType name="processedEnum">
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        <xs:whiteSpace value="collapse"/>
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        <xs:enumeration value="R"/>
    </xs:restriction>
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<xs:simpleType name="pressureMeasTypeEnum">
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        <xs:whiteSpace value="collapse"/>
        <xs:enumeration value="A"/>
        <xs:enumeration value="V"/>
    </xs:restriction>
</xs:simpleType>



```

```

<xs:simpleType name="pairStackedEnum">
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    <xs:enumeration value="U"/>
  </xs:restriction>
</xs:simpleType>

<!-- Picks determination enumeration -->
<xs:simpleType name="picksDeterminationEnum">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:enumeration value="A"/>
    <xs:enumeration value="H"/>
    <xs:enumeration value="R"/>
    <xs:enumeration value="U"/>
  </xs:restriction>
</xs:simpleType>

<!-- Qualitative depth enumeration -->
<xs:simpleType name="qualitativeDepthEnum">
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    <xs:enumeration value="I"/>
    <xs:enumeration value="S"/>
    <xs:enumeration value="U"/>
  </xs:restriction>
</xs:simpleType>

<!-- Data type enumeration -->
<xs:simpleType name="dataTypeEnum">
  <xs:restriction base="xs:string">
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    <xs:enumeration value="U"/>
  </xs:restriction>
</xs:simpleType>

<!-- Distance enumeration -->
<xs:simpleType name="distEnum">
  <xs:restriction base="xs:string">
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    <xs:enumeration value="I"/>
    <xs:enumeration value="P"/>
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  </xs:restriction>
</xs:simpleType>

<!-- Quality enumeration -->
<xs:simpleType name="qualityEnum">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:enumeration value="E"/>
    <xs:enumeration value="G"/>
    <xs:enumeration value="P"/>
    <xs:enumeration value="U"/>
  </xs:restriction>
</xs:simpleType>

```

```

<!-- DEM quality enumeration -->
<xs:simpleType name="DEMQualityEnum">
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    <xs:enumeration value="F"/>
    <xs:enumeration value="G"/>
    <xs:enumeration value="U"/>
  </xs:restriction>
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<!-- Start position enumeration -->
<xs:simpleType name="startPositionEnum">
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    <xs:whiteSpace value="collapse"/>
    <xs:enumeration value="BLC"/>
    <xs:enumeration value="TLC"/>
  </xs:restriction>
</xs:simpleType>

<!-- Limb enumeration -->
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    <xs:enumeration value="DES"/>
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<!-- Precipitation type enumeration -->
<xs:simpleType name="precipitationTypeEnum">
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    <xs:enumeration value="FR"/>
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    <xs:enumeration value="H-FR"/>
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<!-- Earthquake type enumeration -->
<xs:simpleType name="eqTypeEnum">
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<xs:enumeration value="VLP"/>
<xs:enumeration value="E"/>
<xs:enumeration value="U"/>
<xs:enumeration value="O"/>
<xs:enumeration value="X"/>
</xs:restriction>
</xs:simpleType>


<xs:simpleType name="trmTypeEnum">
<xs:restriction base="xs:string">
<xs:whiteSpace value="collapse"/>
<xs:enumeration value="G"/>
<xs:enumeration value="M"/>
<xs:enumeration value="H"/>
<xs:enumeration value="C"/>
</xs:restriction>
</xs:simpleType>


<xs:simpleType name="gasSpeciesEnum">
<xs:restriction base="xs:string">
<xs:whiteSpace value="collapse"/>
<xs:enumeration value="CO2"/>
<xs:enumeration value="SO2"/>
<xs:enumeration value="H2S"/>
<xs:enumeration value="HCl"/>
<xs:enumeration value="HF"/>
<xs:enumeration value="CH4"/>
<xs:enumeration value="H2"/>
<xs:enumeration value="CO"/>
<xs:enumeration value="3He4He"/>
<xs:enumeration value="d13C"/>
<xs:enumeration value="d34S"/>
<xs:enumeration value="d18O"/>
<xs:enumeration value="dD"/>
</xs:restriction>
</xs:simpleType>


<xs:simpleType name="wavefromdistanceEnum">
<xs:restriction base="xs:string">
<xs:whiteSpace value="collapse"/>
<xs:enumeration value="P"/>
<xs:enumeration value="I"/>
<xs:enumeration value="D"/>
<xs:enumeration value="U"/>
</xs:restriction>
</xs:simpleType>


<xs:simpleType name="plumeSpeciesEnum">
<xs:restriction base="xs:string">
<xs:whiteSpace value="collapse"/>
<xs:enumeration value="CO2"/>

```

```

<xs:enumeration value="SO2"/>
<xs:enumeration value="H2S"/>
<xs:enumeration value="HCl"/>
<xs:enumeration value="HF"/>
<xs:enumeration value="CO"/>
</xs:restriction>
</xs:simpleType>

<!-- Hydrologic species enumeration -->
<xs:simpleType name="hydroSpeciesEnum">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:enumeration value="SO4"/>
    <xs:enumeration value="H2S"/>
    <xs:enumeration value="Cl"/>
    <xs:enumeration value="F"/>
    <xs:enumeration value="HCO3"/>
    <xs:enumeration value="Mg"/>
    <xs:enumeration value="Fe"/>
    <xs:enumeration value="Ca"/>
    <xs:enumeration value="Na"/>
    <xs:enumeration value="K"/>
    <xs:enumeration value="3He4He"/>
    <xs:enumeration value="c3He4He"/>
    <xs:enumeration value="d13C"/>
    <xs:enumeration value="d34S"/>
    <xs:enumeration value="d18O"/>
    <xs:enumeration value="dD"/>
  </xs:restriction>
</xs:simpleType>

<!-- Original recalculated enumeration -->
<xs:simpleType name="oriRecalEnum">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:enumeration value="O"/>
    <xs:enumeration value="R"/>
  </xs:restriction>
</xs:simpleType>

<!-- Digitize Original enumeration -->
<xs:simpleType name="orgDigEnum">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:enumeration value="D"/>
    <xs:enumeration value="O"/>
  </xs:restriction>
</xs:simpleType>

<!-- General Deformation Instrument enumeration -->
<xs:simpleType name="diGenTypeEnum">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:enumeration value="Angle"/>
    <xs:enumeration value="CGPS"/>
    <xs:enumeration value="EDM"/>
    <xs:enumeration value="EDM_Reflector"/>
    <xs:enumeration value="GPS"/>
    <xs:enumeration value="Total_Station"/>
    <xs:enumeration value="OtherTypes"/>
  </xs:restriction>
</xs:simpleType>
```

```

<!-- Deformation Tilt/Strain instrument enumeration -->
<xs:simpleType name="diTltTypeEnum">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:enumeration value="Tilt"/>
    <xs:enumeration value="Strain"/>
  </xs:restriction>
</xs:simpleType>

<!-- Time -->
<xs:simpleType name="time">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:length value="8"/>
    <xs:pattern value="[0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="2[0-3]:[0-5][0-9]:[0-5][0-9]"/>
  </xs:restriction>
</xs:simpleType>

<!-- Date time (BC accepted) -->
<xs:simpleType name="dateTimeBC">
  <xs:restriction base="xs:string">
    <xs:whiteSpace value="collapse"/>
    <xs:pattern value="" />
    <xs:pattern value="([ ])*"/>
    <xs:pattern value="[0-9]{1}-0[0-9]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-0[0-9]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-0[0-9]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-1[0-2]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-1[0-2]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-1[0-2]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-0[0-9]-0[0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-0[0-9]-[1-2][0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-0[0-9]-3[0-1] 2[0-3]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-1[0-2]-0[0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-1[0-2]-[1-2][0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="[0-9]{1}-1[0-2]-3[0-1] 2[0-3]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-0[0-9]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-0[0-9]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-0[0-9]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-1[0-2]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-1[0-2]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-1[0-2]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-0[0-9]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-0[0-9]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-0[0-9]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-1[0-2]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-1[0-2]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{1}-1[0-2]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-0[0-9]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-0[0-9]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-0[0-9]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-1[0-2]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-1[0-2]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-1[0-2]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-0[0-9]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-0[0-9]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-0[0-9]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-1[0-2]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-1[0-2]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-1[0-2]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-0[0-9]-0[0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>
    <xs:pattern value="-[0-9]{2}-0[0-9]-[1-2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]"/>

```



```

<xs:pattern value="-[0-9]{5}-1[0-2]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" />
<xs:pattern value="-[0-9]{5}-0[0-9]-0[0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" />
<xs:pattern value="-[0-9]{5}-0[0-9]-1[2][0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" />
<xs:pattern value="-[0-9]{5}-0[0-9]-3[0-1] 2[0-3]:[0-5][0-9]:[0-5][0-9]" />
<xs:pattern value="-[0-9]{5}-1[0-2]-0[0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" />
<xs:pattern value="-[0-9]{5}-1[0-2]-1[2][0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" />
<xs:pattern value="-[0-9]{5}-1[0-2]-3[0-1] 2[0-3]:[0-5][0-9]:[0-5][0-9]" />
</xs:restriction>
</xs:simpleType>

<!-- Date time --&gt;
&lt;xs:simpleType name="dateTime"&gt;
  &lt;xs:restriction base="xs:string"&gt;
    &lt;xs:whiteSpace value="collapse"/&gt;
    &lt;xs:pattern value="[0-9]{4}-0[0-9]-0[2][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[0-9]-3[0-1]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-0[2][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-3[0-1]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-0[1-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-1[2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-0[1-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-1[2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-0[1-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-1[2][0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-3[0-1] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-0[1-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-1[2][0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-3[0-1] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;/xs:restriction&gt;
  &lt;/xs:simpleType&gt;

<!-- Date time (can be empty) --&gt;
&lt;xs:simpleType name="dateTimeEmpty"&gt;
  &lt;xs:restriction base="xs:string"&gt;
    &lt;xs:whiteSpace value="collapse"/&gt;
    &lt;xs:pattern value="" /&gt;
    &lt;xs:pattern value="([ ])*" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[0-9]-0[2][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[0-9]-3[0-1]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-0[2][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-3[0-1]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-0[1-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-1[2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-0[1-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-1[2][0-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-3[0-1] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-0[1-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-1[2][0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-3[0-1] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-0[1-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-1[2][0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;xs:pattern value="[0-9]{4}-1[0-2]-3[0-1] 2[0-3]:[0-5][0-9]:[0-5][0-9]" /&gt;
    &lt;/xs:restriction&gt;
  &lt;/xs:simpleType&gt;

<!-- Date time with microseconds --&gt;
&lt;xs:simpleType name="dateTimemsec"&gt;
  &lt;xs:restriction base="xs:string"&gt;
    &lt;xs:whiteSpace value="collapse"/&gt;
    &lt;xs:pattern value="[0-9]{4}-0[1-9]-0[1-9] [0-1][0-9]:[0-5][0-9]:[0-5][0-9]" /&gt;
</pre>

```



```

<xs:pattern value="[0-9]{4}-1[0-2]-[0-2][0-9] 2[0-3]:[0-5][0-9]:[0-5][0-9].([0-9])*/>
<xs:pattern value="[0-9]{4}-1[0-2]-3[0-1] 2[0-3]:[0-5][0-9]:[0-5][0-9].([0-9])*/>
</xs:restriction>
</xs:simpleType>

<!-- ===== -->
<!-- Attribute groups -->
<!-- ===== -->
<!-- Owners + publish date -->
<xs:attributeGroup name="OwnersPubDateGroup">
  <xs:attribute name="owner1" type="string15NE"/>
  <xs:attribute name="owner2" type="string15NE"/>
  <xs:attribute name="owner3" type="string15NE"/>
  <xs:attribute name="pubDate" type="dateTime"/>
  <xs:attribute name="v" type="xs:string"/>
</xs:attributeGroup>

<!-- ===== -->
<!-- Groups -->
<!-- ===== -->
<!-- Common network -->
<xs:group name="CommonNetworkGroup">
  <xs:sequence>
    <xs:element name="Volcanoes" type="VolcanoesType"/>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="area" type="float" minOccurs="0"/>
    <xs:element name="commonNetMap" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="diffUTC" type="float" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
      <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
</xs:group>

<!-- Latitude longitude group -->
<xs:group name="latLonGroup">
  <xs:sequence>
    <xs:element name="lat" type="deg-90-90"/>
    <xs:element name="lon" type="deg-180-180"/>
  </xs:sequence>
</xs:group>

<!-- Instrument latitude longitude group -->
<xs:group name="instLatLonGroup">
  <xs:sequence>
    <xs:element name="instLat" type="deg-90-90"/>
    <xs:element name="instLon" type="deg-180-180"/>
  </xs:sequence>
</xs:group>

<!-- Start latitude longitude group -->
<xs:group name="startLatLonGroup">
  <xs:sequence>
    <xs:element name="startLat" type="deg-90-90"/>
    <xs:element name="startLon" type="deg-180-180"/>
  </xs:sequence>
</xs:group>

```

```

<!-- Moment tensor -->
<xs:group name="momentTensorGroup">
  <xs:sequence>
    <xs:element name="momentTensorScale" type="float"/>
    <xs:element name="momentTensorXX" type="float"/>
    <xs:element name="momentTensorXY" type="float"/>
    <xs:element name="momentTensorXZ" type="float"/>
    <xs:element name="momentTensorYY" type="float"/>
    <xs:element name="momentTensorYZ" type="float"/>
    <xs:element name="momentTensorZZ" type="float"/>
  </xs:sequence>
</xs:group>

<!-- ===== -->
<!-- Complex types -->
<!-- ===== -->
<!-- wovoml (root) -->
<xs:complexType name="wovomlType">
  <xs:sequence>
    <!-- Observations -->
    <xs:element name="Observations" type="ObservationsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Inferred processes -->
    <xs:element name="InferredProcesses" type="InferredProcessesType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Eruptions -->
    <xs:element name="Eruptions" type="EruptionsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Monitoring systems -->
    <xs:element name="MonitoringSystems" type="MonitoringSystemsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Data -->
    <xs:element name="Data" type="DataType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="version" type="xs:string" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Observations -->
<xs:complexType name="ObservationsType">
  <xs:sequence>
    <!-- Observation -->
    <xs:element name="Observation" type="ObservationType" minOccurs="1" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="volcano" type="string12NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Observation -->
<xs:complexType name="ObservationType">
  <xs:sequence>
    <xs:element name="description" type="xs:string"/>
    <xs:element name="startTime" type="dateTime" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="volcano" type="string12NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Inferred processes -->
<xs:complexType name="InferredProcessesType">
  <xs:sequence>

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<!-- Magma movement -->
<xss:element name="MagmaMovement" type="MagmaMovementType" minOccurs="0" maxOccurs="unbounded"/>
<!-- Volatile saturation -->
<xss:element name="VolatileSat" type="VolatileSatType" minOccurs="0" maxOccurs="unbounded"/>
<!-- Magma pressure -->
<xss:element name="MagmaPressure" type="MagmaPressureType" minOccurs="0" maxOccurs="unbounded"/>
<!-- Hydrothermal -->
<xss:element name="Hydrothermal" type="HydrothermalType" minOccurs="0" maxOccurs="unbounded"/>
<!-- Regional tectonics -->
<xss:element name="RegionalTectonics" type="RegionalTectonicsType" minOccurs="0" maxOccurs="unbounded"/>
</xss:sequence>
<xss:attribute name="volcano" type="string12NE"/>
<xss:attributeGroup ref="OwnersPubDateGroup"/>
</xss:complexType>

<!-- Magma movement -->
<xss:complexType name="MagmaMovementType">
  <xss:sequence>
    <xss:element name="inferTime" type="dateTime" minOccurs="0"/>
    <xss:element name="inferTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xss:element name="startTime" type="dateTime" minOccurs="0"/>
    <xss:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xss:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xss:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xss:element name="deepSupp" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="ascent" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="convecBelow" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="convecAbove" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="magmaMix" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="dikeIntru" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="pipeIntru" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="sillIntru" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xss:element name="comments" type="string255" minOccurs="0"/>
  </xss:sequence>
  <xss:attribute name="code" type="string30NE" use="required"/>
  <xss:attribute name="volcano" type="string12NE"/>
  <xss:attributeGroup ref="OwnersPubDateGroup"/>
</xss:complexType>

<!-- Volatile saturation -->
<xss:complexType name="VolatileSatType">
  <xss:sequence>
    <xss:element name="inferTime" type="dateTime" minOccurs="0"/>
    <xss:element name="inferTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xss:element name="startTime" type="dateTime" minOccurs="0"/>
    <xss:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xss:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xss:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xss:element name="CO2Sat" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="H2OSat" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="decompress" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="fugacity" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="volatileAdd" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="crystalOr2ndBoil" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="vesicul" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="devesicul" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="degas" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xss:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xss:element name="comments" type="string255" minOccurs="0"/>
  </xss:sequence>
  <xss:attribute name="code" type="string30NE" use="required"/>
  <xss:attribute name="volcano" type="string12NE"/>

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<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="MagmaPressureType">
  <xs:sequence>
    <xs:element name="inferTime" type="dateTime" minOccurs="0"/>
    <xs:element name="inferTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="gasInduced" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="tectInduced" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="volcano" type="string12NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="HydrothermalType">
  <xs:sequence>
    <xs:element name="inferTime" type="dateTime" minOccurs="0"/>
    <xs:element name="inferTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="heatGwater" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="poreDestab" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="poreDeform" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="hydrofract" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="boilTremor" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="absorSolGas" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="speciesEqbChange" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="boilDryChimneys" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="volcano" type="string12NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="RegionalTectonicsType">
  <xs:sequence>
    <xs:element name="inferTime" type="dateTime" minOccurs="0"/>
    <xs:element name="inferTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="tectonicChanges" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="staticStress" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="dynamicStrain" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="localShear" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="slowEarthquake" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="distalPressure" type="yesNoMaybeUnkEnum" minOccurs="0"/>
    <xs:element name="distalDepression" type="yesNoMaybeUnkEnum" minOccurs="0"/>
  </xs:sequence>

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<xs:element name="hydrothermalLubrication" type="yesNoMaybeUnkEnum" minOccurs="0"/>
<xs:element name="earthTide" type="yesNoMaybeUnkEnum" minOccurs="0"/>
<xs:element name="atmosInfluence" type="yesNoMaybeUnkEnum" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="volcano" type="string12NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Eruptions -->
<xs:complexType name="EruptionsType">
  <xs:sequence>
    <!-- Eruption -->
    <xs:element name="Eruption" type="EruptionType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Phase alone -->
    <xs:element name="Phases" type="PhasesType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Video alone -->
    <xs:element name="Video" type="VideoAloneType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Forecast alone -->
    <xs:element name="Forecast" type="ForecastAloneType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="volcano" type="string12NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Eruption -->
<xs:complexType name="EruptionType">
  <xs:sequence>
    <!-- Eruption information -->
    <xs:element name="name" type="string60" minOccurs="0"/>
    <xs:element name="narrative" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTimeBC"/>
    <xs:element name="startTimeBC" type="xs:integer" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeBC" minOccurs="0"/>
    <xs:element name="endTimeBC" type="xs:integer" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="climaxTime" type="dateTimeBC" minOccurs="0"/>
    <xs:element name="climaxTimeBC" type="xs:integer" minOccurs="0"/>
    <xs:element name="climaxTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
    <!-- Video -->
    <xs:element name="Video" type="VideoType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Phase -->
    <xs:element name="Phase" type="PhaseType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="volcano" type="string12NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Phase -->
<xs:complexType name="PhaseType">
  <xs:sequence>
    <!-- Phase information -->
    <xs:element name="phaseNumber" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTimeBC"/>
    <xs:element name="startTimeBC" type="xs:integer" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeBC" minOccurs="0"/>
    <xs:element name="endTimeBC" type="xs:integer" minOccurs="0"/>
  </xs:sequence>

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<xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="vel" type="xs:integer" minOccurs="0"/>
<xs:element name="maxLavaExtru" type="float" minOccurs="0"/>
<xs:element name="maxExpMassDis" type="float" minOccurs="0"/>
<xs:element name="dre" type="float" minOccurs="0"/>
<xs:element name="magmaMix" type="yesNoUnkEnum" minOccurs="0"/>
<xs:element name="maxColHeight" type="float" minOccurs="0"/>
<xs:element name="colHeightDet" type="string255" minOccurs="0"/>
<xs:element name="minSiO2MatrixGlass" type="float" minOccurs="0"/>
<xs:element name="maxSiO2MatrixGlass" type="float" minOccurs="0"/>
<xs:element name="minSiO2WholeRock" type="float" minOccurs="0"/>
<xs:element name="maxSiO2WholeRock" type="float" minOccurs="0"/>
<xs:element name="totCrystal" type="float" minOccurs="0"/>
<xs:element name="phenoContent" type="float" minOccurs="0"/>
<xs:element name="phenoAssemb" type="string255" minOccurs="0"/>
<xs:element name="preEruptH2OContent" type="float" minOccurs="0"/>
<xs:element name="phenoMeltInclusion" type="string255" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- Video -->
<xs:element name="Video" type="VideoType" minOccurs="0" maxOccurs="unbounded"/>
<!-- Forecast -->
<xs:element name="Forecast" type="ForecastType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Phases -->
<xs:complexType name="PhasesType">
  <xs:sequence>
    <!-- Phase alone -->
    <xs:element name="Phase" type="PhaseAloneType" minOccurs="1" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="eruption" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Phase alone -->
<xs:complexType name="PhaseAloneType">
  <xs:sequence>
    <!-- Phase information -->
    <xs:element name="phaseNumber" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTimeBC"/>
    <xs:element name="startTimeBC" type="xs:integer" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeBC" minOccurs="0"/>
    <xs:element name="endTimeBC" type="xs:integer" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="vel" type="xs:integer" minOccurs="0"/>
    <xs:element name="maxLavaExtru" type="float" minOccurs="0"/>
    <xs:element name="maxExpMassDis" type="float" minOccurs="0"/>
    <xs:element name="dre" type="float" minOccurs="0"/>
    <xs:element name="magmaMix" type="yesNoUnkEnum" minOccurs="0"/>
    <xs:element name="maxColHeight" type="float" minOccurs="0"/>
    <xs:element name="colHeightDet" type="string255" minOccurs="0"/>
    <xs:element name="minSiO2MatrixGlass" type="float" minOccurs="0"/>
    <xs:element name="maxSiO2MatrixGlass" type="float" minOccurs="0"/>
    <xs:element name="minSiO2WholeRock" type="float" minOccurs="0"/>
    <xs:element name="maxSiO2WholeRock" type="float" minOccurs="0"/>
    <xs:element name="totCrystal" type="float" minOccurs="0"/>
    <xs:element name="phenoContent" type="float" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

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<xs:element name="phenoAssemb" type="string255" minOccurs="0"/>
<xs:element name="preEruptH2OContent" type="float" minOccurs="0"/>
<xs:element name="phenoMeltInclusion" type="string255" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- Video -->
<xs:element name="Video" type="VideoType" minOccurs="0" maxOccurs="unbounded"/>
<!-- Forecast -->
<xs:element name="Forecast" type="ForecastType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="eruption" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Video -->
<xs:complexType name="VideoType">
  <xs:sequence>
    <xs:element name="link" type="string255"/>
    <xs:element name="startTime" type="dateTime" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="length" type="time" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Video alone -->
<xs:complexType name="VideoAloneType">
  <xs:sequence>
    <xs:element name="link" type="string255"/>
    <xs:element name="startTime" type="dateTime" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="length" type="time" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="volcano" type="string12NE"/>
  <xs:attribute name="eruption" type="string30NE"/>
  <xs:attribute name="phase" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Forecast -->
<xs:complexType name="ForecastType">
  <xs:sequence>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="earliestStartTime" type="dateTime" minOccurs="0"/>
    <xs:element name="earliestStartTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="latestStartTime" type="dateTime" minOccurs="0"/>
    <xs:element name="latestStartTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="issueTime" type="dateTime"/>
    <xs:element name="issueTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="timeSuccess" type="successEnum" minOccurs="0"/>
    <xs:element name="magniSuccess" type="successEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

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<!-- Forecast alone -->
<xs:complexType name="ForecastAloneType">
  <xs:sequence>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="earliestStartTime" type="dateTime" minOccurs="0"/>
    <xs:element name="earliestStartTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="latestStartTime" type="dateTime" minOccurs="0"/>
    <xs:element name="latestStartTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="issueTime" type="dateTime"/>
    <xs:element name="issueTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="timeSuccess" type="successEnum" minOccurs="0"/>
    <xs:element name="magniSuccess" type="successEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="volcano" type="string12NE"/>
  <xs:attribute name="phase" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Monitoring systems -->
<xs:complexType name="MonitoringSystemsType">
  <xs:sequence>
    <!-- Airplane -->
    <xs:element name="Airplane" type="AirplaneType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Satellite -->
    <xs:element name="Satellite" type="SatelliteType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Deformation network -->
    <xs:element name="DeformationNetwork" type="DeformationNetworkType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Deformation stations -->
    <xs:element name="DeformationStations" type="DeformationStationsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Deformation instruments -->
    <xs:element name="DeformationInstruments" type="DeformationInstrumentsType" minOccurs="0" maxOccurs="unboun-
ded"/>
    <!-- Gas network -->
    <xs:element name="GasNetwork" type="GasNetworkType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Gas stations -->
    <xs:element name="GasStations" type="GasStationsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Gas instruments -->
    <xs:element name="GasInstruments" type="GasInstrumentsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Hydrologic network -->
    <xs:element name="HydrologicNetwork" type="HydrologicNetworkType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Hydrologic stations -->
    <xs:element name="HydrologicStations" type="HydrologicStationsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Hydrologic instruments -->
    <xs:element name="HydrologicInstruments" type="HydrologicInstrumentsType" minOccurs="0" maxOccurs="unboun-
ded"/>
    <!-- Fields network -->
    <xs:element name="FieldsNetwork" type="FieldsNetworkType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Fields stations -->
    <xs:element name="FieldsStations" type="FieldsStationsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Fields instruments -->
    <xs:element name="FieldsInstruments" type="FieldsInstrumentsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Thermal network -->
    <xs:element name="ThermalNetwork" type="ThermalNetworkType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Thermal stations -->
    <xs:element name="ThermalStations" type="ThermalStationsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Thermal instruments -->
    <xs:element name="ThermalInstruments" type="ThermalInstrumentsType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Meteo network -->
    <xs:element name="MeteoNetwork" type="MeteoNetworkType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Meteo stations -->
    <xs:element name="MeteoStations" type="MeteoStationsType" minOccurs="0" maxOccurs="unbounded"/>

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<!-- Meteo instruments -->
<xs:element name="MeteoInstruments" type="MeteoInstrumentsType" minOccurs="0" maxOccurs="unbounded"/>
<!-- Seismic network -->
<xs:element name="SeismicNetwork" type="SeismicNetworkType" minOccurs="0" maxOccurs="unbounded"/>
<!-- Seismic stations -->
<xs:element name="SeismicStations" type="SeismicStationsType" minOccurs="0" maxOccurs="unbounded"/>
<!-- Seismic instruments -->
<xs:element name="SeismicInstruments" type="SeismicInstrumentsType" minOccurs="0" maxOccurs="unbounded"/>
<!-- Seismic components -->
<xs:element name="SeismicComponents" type="SeismicComponentsType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Airplane -->
<xs:complexType name="AirplaneType">
  <xs:sequence>
    <xs:element name="name" type="string50" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
    <!-- Gas instrument -->
    <xs:element name="GasInstrument" type="GasInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Thermal instrument -->
    <xs:element name="ThermalInstrument" type="ThermalInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Satellite -->
<xs:complexType name="SatelliteType">
  <xs:sequence>
    <xs:element name="name" type="string50" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Deformation network -->
<xs:complexType name="DeformationNetworkType">
  <xs:sequence>
    <xs:group ref="CommonNetworkGroup"/>
    <!-- Deformation station -->
    <xs:element name="DeformationStation" type="DeformationStationType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

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<!-- Deformation station -->
<xss:complexType name="DeformationStationType">
  <xss:sequence>
    <xss:element name="name" type="string30" minOccurs="0"/>
    <xss:element name="permInst" type="string255" minOccurs="0"/>
    <xss:group ref="latLonGroup" minOccurs="0"/>
    <xss:element name="elev" type="float" minOccurs="0"/>
    <xss:element name="horizPrecision" type="float" minOccurs="0"/>
    <xss:element name="startTime" type="dateTime"/>
    <xss:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xss:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xss:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xss:element name="diffUTC" type="float" minOccurs="0"/>
    <xss:element name="refStation" type="yesNoEnum" minOccurs="0"/>
    <xss:element name="description" type="string255" minOccurs="0"/>
    <xss:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xss:element name="comments" type="string255" minOccurs="0"/>

    <!-- Deformation instrument -->
    <xss:element name="DeformationInstrument" type="DeformationInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
      <!-- Tilt/Instrument instrument -->
      <xss:element name="TiltStrainInstrument" type="TiltStrainInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
    </xss:sequence>
    <xss:attribute name="code" type="string30NE" use="required"/>
    <xss:attributeGroup ref="OwnersPubDateGroup"/>
  </xss:complexType>

  <!-- Deformation stations -->
  <xss:complexType name="DeformationStationsType">
    <xss:sequence>
      <!-- Deformation station -->
      <xss:element name="DeformationStation" type="DeformationStationAloneType" minOccurs="0" maxOccurs="unbounded"/>
    </xss:sequence>
    <xss:attribute name="network" type="string30NE"/>
    <xss:attributeGroup ref="OwnersPubDateGroup"/>
  </xss:complexType>

  <!-- Deformation station alone -->
  <xss:complexType name="DeformationStationAloneType">
    <xss:sequence>
      <xss:element name="name" type="string30" minOccurs="0"/>
      <xss:element name="permInst" type="string255" minOccurs="0"/>
      <xss:group ref="latLonGroup" minOccurs="0"/>
      <xss:element name="elev" type="float" minOccurs="0"/>
      <xss:element name="horizPrecision" type="float" minOccurs="0"/>
      <xss:element name="startTime" type="dateTime"/>
      <xss:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
      <xss:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
      <xss:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
      <xss:element name="diffUTC" type="float" minOccurs="0"/>
      <xss:element name="refStation" type="yesNoEnum" minOccurs="0"/>
      <xss:element name="description" type="string255" minOccurs="0"/>
      <xss:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
      <xss:element name="comments" type="string255" minOccurs="0"/>
      <!-- Deformation instrument -->
      <xss:element name="DeformationInstrument" type="DeformationInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
        <!-- Tilt/Instrument instrument -->
        <xss:element name="TiltStrainInstrument" type="TiltStrainInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
    </xss:sequence>
    <xss:attribute name="code" type="string30NE" use="required"/>
  </xss:complexType>

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<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Deformation instrument -->
<xs:complexType name="DeformationInstrumentType">
  <xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="diGenTypeEnum" />
    <xs:element name="units" type="string30" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="signalToNoise" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Tilt/Strain instrument -->
<xs:complexType name="TiltStrainInstrumentType">
  <xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="diTiltTypeEnum" />
    <xs:element name="depth" type="float" minOccurs="0"/>
    <xs:element name="units" type="string30" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="direction1" type="deg0-360" minOccurs="0"/>
    <xs:element name="direction2" type="deg0-360" minOccurs="0"/>
    <xs:element name="direction3" type="deg0-360" minOccurs="0"/>
    <xs:element name="direction4" type="deg0-360" minOccurs="0"/>
    <xs:element name="electroConv1" type="float" minOccurs="0"/>
    <xs:element name="electroConv2" type="float" minOccurs="0"/>
    <xs:element name="electroConv3" type="float" minOccurs="0"/>
    <xs:element name="electroConv4" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Deformation instruments -->
<xs:complexType name="DeformationInstrumentsType">
  <xs:sequence>
    <!-- Deformation instrument -->
    <xs:element name="DeformationInstrument" type="DeformationInstrumentAloneType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Tilt/Strain instrument -->
    <xs:element name="TiltStrainInstrument" type="TiltStrainInstrumentAloneType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

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<!-- Deformation instrument alone -->
<xs:complexType name="DeformationInstrumentAloneType">
  <xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="diGenTypeEnum" />
    <xs:element name="units" type="string30" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="signalToNoise" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Tilt/Strain instrument alone -->
<xs:complexType name="TiltStrainInstrumentAloneType">
  <xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="diTiltTypeEnum"/>
    <xs:element name="depth" type="float" minOccurs="0"/>
    <xs:element name="units" type="string30" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="direction1" type="deg0-360" minOccurs="0"/>
    <xs:element name="direction2" type="deg0-360" minOccurs="0"/>
    <xs:element name="direction3" type="deg0-360" minOccurs="0"/>
    <xs:element name="direction4" type="deg0-360" minOccurs="0"/>
    <xs:element name="electroConv1" type="float" minOccurs="0"/>
    <xs:element name="electroConv2" type="float" minOccurs="0"/>
    <xs:element name="electroConv3" type="float" minOccurs="0"/>
    <xs:element name="electroConv4" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gas network -->
<xs:complexType name="GasNetworkType">
  <xs:sequence>
    <xs:group ref="CommonNetworkGroup"/>
    <!-- Gas station -->
    <xs:element name="GasStation" type="GasStationType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gas station -->
<xs:complexType name="GasStationType">
  <xs:sequence>

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<xs:element name="name" type="string50" minOccurs="0"/>
<xs:group ref="latLonGroup" minOccurs="0"/>
<xs:element name="elev" type="float" minOccurs="0"/>
<xs:element name="permInst" type="string255" minOccurs="0"/>
<xs:element name="type" type="string255" minOccurs="0"/>
<xs:element name="diffUTC" type="float" minOccurs="0"/>
<xs:element name="startTime" type="dateTime"/>
<xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
<xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- Gas instrument -->
<xs:element name="GasInstrument" type="GasInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gas instrument -->
<xs:complexType name="GasInstrumentType">
  <xs:sequence>
    <xs:element name="type" type="string255" minOccurs="0"/>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="units" type="string50" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="signalToNoise" type="float" minOccurs="0"/>
    <xs:element name="calibration" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gas stations -->
<xs:complexType name="GasStationsType">
  <xs:sequence>
    <!-- Gas station -->
    <xs:element name="GasStation" type="GasStationAloneType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="network" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gas station alone -->
<xs:complexType name="GasStationAloneType">
  <xs:sequence>
    <xs:element name="name" type="string50" minOccurs="0"/>
    <xs:group ref="latLonGroup" minOccurs="0"/>
    <xs:element name="elev" type="float" minOccurs="0"/>
    <xs:element name="permInst" type="string255" minOccurs="0"/>
    <xs:element name="type" type="string255" minOccurs="0"/>
    <xs:element name="diffUTC" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
  </xs:sequence>

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<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- Gas instrument -->
<xs:element name="GasInstrument" type="GasInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gas instruments -->
<xs:complexType name="GasInstrumentsType">
<xs:sequence>
    <!-- Gas instrument -->
    <xs:element name="GasInstrument" type="GasInstrumentAloneType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="airplane" type="string30NE"/>
<xs:attribute name="satellite" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gas instrument alone -->
<xs:complexType name="GasInstrumentAloneType">
<xs:sequence>
    <xs:element name="type" type="string255" minOccurs="0"/>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="units" type="string50" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="signalToNoise" type="float" minOccurs="0"/>
    <xs:element name="calibration" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="airplane" type="string30NE"/>
<xs:attribute name="satellite" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Hydrologic network -->
<xs:complexType name="HydrologicNetworkType">
<xs:sequence>
    <xs:group ref="CommonNetworkGroup"/>
    <!-- Hydrologic station -->
    <xs:element name="HydrologicStation" type="HydrologicStationType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Hydrologic station -->
<xs:complexType name="HydrologicStationType">
<xs:sequence>
    <xs:group ref="latLonGroup" minOccurs="0"/>
    <xs:element name="elev" type="float" minOccurs="0"/>
    <xs:element name="permInst" type="string255" minOccurs="0"/>

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<xs:element name="name" type="string30" minOccurs="0"/>
<xs:element name="waterBodyType" type="string255" minOccurs="0"/>
<xs:element name="diffUTC" type="float" minOccurs="0"/>
<xs:element name="screenTop" type="float" minOccurs="0"/>
<xs:element name="screenBottom" type="float" minOccurs="0"/>
<xs:element name="wellDepth" type="double" minOccurs="0"/>
<xs:element name="startTime" type="dateTime"/>
<xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
<xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- Hydrologic instrument -->
<xs:element name="HydrologicInstrument" type="HydrologicInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Hydrologic instrument -->
<xs:complexType name="HydrologicInstrumentType">
<xs:sequence>
<xs:element name="name" type="string255" minOccurs="0"/>
<xs:element name="type" type="string50" minOccurs="0"/>
<xs:element name="pressureMeasType" type="pressureMeasTypeEnum" minOccurs="0"/>
<xs:element name="units" type="string50" minOccurs="0"/>
<xs:element name="resolution" type="float" minOccurs="0"/>
<xs:element name="startTime" type="dateTime"/>
<xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
<xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Hydrologic stations -->
<xs:complexType name="HydrologicStationsType">
<xs:sequence>
<!-- Hydrologic station alone -->
<xs:element name="HydrologicStation" type="HydrologicStationAloneType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Hydrologic station alone -->
<xs:complexType name="HydrologicStationAloneType">
<xs:sequence>
<xs:group ref="latLonGroup" minOccurs="0"/>
<xs:element name="elev" type="float" minOccurs="0"/>
<xs:element name="permlnst" type="string255" minOccurs="0"/>
<xs:element name="name" type="string30" minOccurs="0"/>
<xs:element name="waterBodyType" type="string255" minOccurs="0"/>
<xs:element name="diffUTC" type="float" minOccurs="0"/>
<xs:element name="screenTop" type="float" minOccurs="0"/>
<xs:element name="screenBottom" type="float" minOccurs="0"/>
<xs:element name="wellDepth" type="double" minOccurs="0"/>

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<xs:element name="startTime" type="dateTime"/>
<xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
<xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- Hydrologic instrument -->
<xs:element name="HydrologicInstrument" type="HydrologicInstrumentType" minOccurs="0" maxOc-
curs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Hydrologic instruments -->
<xs:complexType name="HydrologicInstrumentsType">
<xs:sequence>
<!-- Hydrologic instrument -->
<xs:element name="HydrologicInstrument" type="HydrologicInstrumentAloneType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Hydrologic instrument alone -->
<xs:complexType name="HydrologicInstrumentAloneType">
<xs:sequence>
<xs:element name="name" type="string255" minOccurs="0"/>
<xs:element name="type" type="string50" minOccurs="0"/>
<xs:element name="pressureMeasType" type="pressureMeasTypeEnum" minOccurs="0"/>
<xs:element name="units" type="string50" minOccurs="0"/>
<xs:element name="resolution" type="float" minOccurs="0"/>
<xs:element name="startTime" type="dateTime"/>
<xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
<xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Fields network -->
<xs:complexType name="FieldsNetworkType">
<xs:sequence>
<xs:group ref="CommonNetworkGroup"/>
<!-- Fields station -->
<xs:element name="FieldsStation" type="FieldsStationType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Fields station -->
<xs:complexType name="FieldsStationType">
<xs:sequence>
<xs:element name="name" type="string50" minOccurs="0"/>
<xs:group ref="latLonGroup" minOccurs="0"/>

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<xs:element name="elev" type="float" minOccurs="0"/>
<xs:element name="permInst" type="string255" minOccurs="0"/>
<xs:element name="diffUTC" type="float" minOccurs="0"/>
<xs:element name="startTime" type="dateTime"/>
<xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
<xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>

<!-- Fields instrument -->
<xs:element name="FieldsInstrument" type="FieldsInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Fields instrument -->
<xs:complexType name="FieldsInstrumentType">
  <xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="string255" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="units" type="string255" minOccurs="0"/>
    <xs:element name="sampleRate" type="float" minOccurs="0"/>
    <xs:element name="filterType" type="string255" minOccurs="0"/>
    <xs:element name="orientation" type="string255" minOccurs="0"/>
    <xs:element name="calculation" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Fields stations -->
<xs:complexType name="FieldsStationsType">
  <xs:sequence>
    <!-- Fields station alone -->
    <xs:element name="FieldsStation" type="FieldsStationAloneType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="network" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Fields station alone -->
<xs:complexType name="FieldsStationAloneType">
  <xs:sequence>
    <xs:element name="name" type="string50" minOccurs="0"/>
    <xs:group ref="latLonGroup" minOccurs="0"/>
    <xs:element name="elev" type="float" minOccurs="0"/>
    <xs:element name="permInst" type="string255" minOccurs="0"/>
    <xs:element name="diffUTC" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

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<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- Fields instrument -->
<xs:element name="FieldsInstrument" type="FieldsInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Fields instruments -->
<xs:complexType name="FieldsInstrumentsType">
<xs:sequence>
    <!-- Fields instrument alone -->
    <xs:element name="FieldsInstrument" type="FieldsInstrumentAloneType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Fields instrument alone -->
<xs:complexType name="FieldsInstrumentAloneType">
<xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="string255" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="units" type="string255" minOccurs="0"/>
    <xs:element name="sampleRate" type="float" minOccurs="0"/>
    <xs:element name="filterType" type="string255" minOccurs="0"/>
    <xs:element name="orientation" type="string255" minOccurs="0"/>
    <xs:element name="calculation" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Thermal network -->
<xs:complexType name="ThermalNetworkType">
<xs:sequence>
    <xs:group ref="CommonNetworkGroup"/>
    <!-- Thermal station -->
    <xs:element name="ThermalStation" type="ThermalStationType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Thermal station -->
<xs:complexType name="ThermalStationType">
<xs:sequence>
    <xs:element name="name" type="string30" minOccurs="0"/>
    <xs:element name="thermalFeatType" type="string255" minOccurs="0"/>
    <xs:element name="groundType" type="string255" minOccurs="0"/>
    <xs:group ref="latLonGroup" minOccurs="0"/>
    <xs:element name="elev" type="float" minOccurs="0"/>
    <xs:element name="permInst" type="string255" minOccurs="0"/>

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<xs:element name="diffUTC" type="float" minOccurs="0"/>
<xs:element name="startTime" type="dateTime"/>
<xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
<xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- Thermal instrument -->
<xs:element name="ThermalInstrument" type="ThermalInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Thermal stations -->
<xs:complexType name="ThermalStationsType">
<xs:sequence>
    <!-- Thermal station -->
    <xs:element name="ThermalStation" type="ThermalStationAloneType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Thermal station alone -->
<xs:complexType name="ThermalStationAloneType">
<xs:sequence>
    <xs:element name="name" type="string30" minOccurs="0"/>
    <xs:element name="thermalFeatType" type="string255" minOccurs="0"/>
    <xs:element name="groundType" type="string255" minOccurs="0"/>
    <xs:group ref="latLonGroup" minOccurs="0"/>
    <xs:element name="elev" type="float" minOccurs="0"/>
    <xs:element name="permInst" type="string255" minOccurs="0"/>
    <xs:element name="diffUTC" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
    <!-- Thermal instrument -->
    <xs:element name="ThermalInstrument" type="ThermalInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Thermal instrument -->
<xs:complexType name="ThermalInstrumentType">
<xs:sequence>
    <xs:element name="type" type="string255" minOccurs="0"/>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="units" type="string50" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="signalToNoise" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>

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        <xs:element name="comments" type="string255" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="code" type="string30NE" use="required"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Thermal instruments -->
<xs:complexType name="ThermalInstrumentsType">
    <xs:sequence>
        <!-- Thermal instrument -->
        <xs:element name="ThermalInstrument" type="ThermalInstrumentAloneType" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attribute name="airplane" type="string30NE"/>
    <xs:attribute name="satellite" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Thermal instrument alone -->
<xs:complexType name="ThermalInstrumentAloneType">
    <xs:sequence>
        <xs:element name="type" type="string255" minOccurs="0"/>
        <xs:element name="name" type="string255" minOccurs="0"/>
        <xs:element name="units" type="string50" minOccurs="0"/>
        <xs:element name="resolution" type="float" minOccurs="0"/>
        <xs:element name="signalToNoise" type="float" minOccurs="0"/>
        <xs:element name="startTime" type="dateTime"/>
        <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
        <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
        <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
        <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
        <xs:element name="comments" type="string255" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="code" type="string30NE" use="required"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attribute name="airplane" type="string30NE"/>
    <xs:attribute name="satellite" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Meteo network -->
<xs:complexType name="MeteoNetworkType">
    <xs:sequence>
        <xs:group ref="CommonNetworkGroup"/>
        <!-- Meteo station -->
        <xs:element name="MeteoStation" type="MeteoStationType" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="code" type="string30NE" use="required"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Meteo station -->
<xs:complexType name="MeteoStationType">
    <xs:sequence>
        <xs:element name="name" type="string30" minOccurs="0"/>
        <xs:group ref="latLonGroup" minOccurs="0"/>
        <xs:element name="elev" type="float" minOccurs="0"/>
        <xs:element name="permInst" type="string255" minOccurs="0"/>
        <xs:element name="waterBodyType" type="string255" minOccurs="0"/>
        <xs:element name="startTime" type="dateTime"/>
        <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
        <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
        <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    </xs:sequence>

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<xs:element name="diffUTC" type="float" minOccurs="0"/>
<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- Meteo instrument -->
<xs:element name="MeteoInstrument" type="MeteoInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Meteo instrument -->
<xs:complexType name="MeteoInstrumentType">
<xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="string50" minOccurs="0"/>
    <xs:element name="units" type="string50" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Meteo stations -->
<xs:complexType name="MeteoStationsType">
<xs:sequence>
    <!-- Meteo station alone -->
    <xs:element name="MeteoStation" type="MeteoStationAloneType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Meteo station alone -->
<xs:complexType name="MeteoStationAloneType">
<xs:sequence>
    <xs:element name="name" type="string30" minOccurs="0"/>
    <xs:group ref="latLonGroup" minOccurs="0"/>
    <xs:element name="elev" type="float" minOccurs="0"/>
    <xs:element name="permInst" type="string255" minOccurs="0"/>
    <xs:element name="waterBodyType" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="diffUTC" type="float" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
    <!-- Meteo instrument -->
    <xs:element name="MeteoInstrument" type="MeteoInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

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<!-- Meteo instruments -->
<xs:complexType name="MeteoInstrumentsType">
  <xs:sequence>
    <!-- Meteo instrument -->
    <xs:element name="MeteoInstrument" type="MeteoInstrumentAloneType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Meteo instrument alone -->
<xs:complexType name="MeteoInstrumentAloneType">
  <xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="string50" minOccurs="0"/>
    <xs:element name="units" type="string50" minOccurs="0"/>
    <xs:element name="resolution" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Seismic network -->
<xs:complexType name="SeismicNetworkType">
  <xs:sequence>
    <xs:element name="Volcanoes" type="VolcanoesType" minOccurs="0"/>
    <xs:element name="name" type="string30" minOccurs="0"/>
    <xs:element name="velocityModel" type="string511" minOccurs="0"/>
    <xs:element name="velocityModelDetail" type="string511" minOccurs="0"/>
    <xs:element name="zeroDepth" type="string255" minOccurs="0"/>
    <xs:element name="fixedDepth" type="yesNoUnkEnum" minOccurs="0"/>
    <xs:element name="fixedDepthDesc" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="numberOfSeismo" type="xs:integer" minOccurs="0"/>
    <xs:element name="numberOfBBSeismo" type="xs:integer" minOccurs="0"/>
    <xs:element name="numberOfSMPSeismo" type="xs:integer" minOccurs="0"/>
    <xs:element name="numberOfDigiSeismo" type="xs:integer" minOccurs="0"/>
    <xs:element name="numberOfAnaSeismo" type="xs:integer" minOccurs="0"/>
    <xs:element name="numberOf3CompSeismo" type="xs:integer" minOccurs="0"/>
    <xs:element name="numberOfMicro" type="xs:integer" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="diffUTC" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
    <!-- Seismic station -->
    <xs:element name="SeismicStation" type="SeismicStationType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

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<!-- Seismic station -->
<xs:complexType name="SeismicStationType">
  <xs:sequence>
    <xs:element name="name" type="string30" minOccurs="0"/>
    <xs:group ref="latLonGroup" minOccurs="0"/>
    <xs:element name="elev" type="float" minOccurs="0"/>
    <xs:element name="instDepth" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="diffUTC" type="float" minOccurs="0"/>
    <xs:element name="instType" type="string255" minOccurs="0"/>
    <xs:element name="systemGain" type="float" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>

    <!-- Seismic instrument -->
    <xs:element name="SeismicInstrument" type="SeismicInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Seismic stations -->
<xs:complexType name="SeismicStationsType">
  <xs:sequence>
    <!-- Seismic station alone -->
    <xs:element name="SeismicStation" type="SeismicStationAloneType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="network" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Seismic station alone -->
<xs:complexType name="SeismicStationAloneType">
  <xs:sequence>
    <xs:element name="name" type="string30" minOccurs="0"/>
    <xs:group ref="latLonGroup" minOccurs="0"/>
    <xs:element name="elev" type="float" minOccurs="0"/>
    <xs:element name="instDepth" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="diffUTC" type="float" minOccurs="0"/>
    <xs:element name="instType" type="string255" minOccurs="0"/>
    <xs:element name="systemGain" type="float" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
    <!-- Seismic instrument -->
    <xs:element name="SeismicInstrument" type="SeismicInstrumentType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="network" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Seismic instrument -->
<xs:complexType name="SeismicInstrumentType">
  <xs:sequence>

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<xs:element name="name" type="string255" minOccurs="0"/>
<xs:element name="type" type="string255" minOccurs="0"/>
<xs:element name="dynamicRange" type="string255" minOccurs="0"/>
<xs:element name="gain" type="float" minOccurs="0"/>
<xs:element name="filters" type="string255" minOccurs="0"/>
<xs:element name="numberOfComp" type="xs:integer" minOccurs="0"/>
<xs:element name="respOverview" type="string255" minOccurs="0"/>
<xs:element name="respFile" type="string255" minOccurs="0"/>
<xs:element name="startTime" type="dateTime"/>
<xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
<xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- Seismic component -->
<xs:element name="SeismicComponent" type="SeismicComponentType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Seismic instruments -->
<xs:complexType name="SeismicInstrumentsType">
  <xs:sequence>
    <!-- Seismic instrument alone -->
    <xs:element name="SeismicInstrument" type="SeismicInstrumentAloneType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Seismic instrument alone -->
<xs:complexType name="SeismicInstrumentAloneType">
  <xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="string255" minOccurs="0"/>
    <xs:element name="dynamicRange" type="string255" minOccurs="0"/>
    <xs:element name="gain" type="float" minOccurs="0"/>
    <xs:element name="filters" type="string255" minOccurs="0"/>
    <xs:element name="numberOfComp" type="xs:integer" minOccurs="0"/>
    <xs:element name="respOverview" type="string255" minOccurs="0"/>
    <xs:element name="respFile" type="string255" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
    <!-- Seismic component -->
    <xs:element name="SeismicComponent" type="SeismicComponentType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Seismic component -->
<xs:complexType name="SeismicComponentType">
  <xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="string255" minOccurs="0"/>
    <xs:element name="respDesc" type="string255" minOccurs="0"/>
    <xs:element name="seedBandCode" type="string30" minOccurs="0"/>
  
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<xs:element name="sampleRate" type="float" minOccurs="0"/>
<xs:element name="seedInstCode" type="string30" minOccurs="0"/>
<xs:element name="seedOrientCode" type="string30" minOccurs="0"/>
<xs:element name="sensitivity" type="string255" minOccurs="0"/>
<xs:element name="depth" type="float" minOccurs="0"/>
<xs:element name="startTime" type="dateTime"/>
<xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Seismic components -->
<xs:complexType name="SeismicComponentsType">
  <xs:sequence>
    <!-- Seismic component -->
    <xs:element name="SeismicComponent" type="SeismicComponentAloneType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Seismic component alone -->
<xs:complexType name="SeismicComponentAloneType">
  <xs:sequence>
    <xs:element name="name" type="string255" minOccurs="0"/>
    <xs:element name="type" type="string255" minOccurs="0"/>
    <xs:element name="respDesc" type="string255" minOccurs="0"/>
    <xs:element name="seedBandCode" type="string30" minOccurs="0"/>
    <xs:element name="sampleRate" type="float" minOccurs="0"/>
    <xs:element name="seedInstCode" type="string30" minOccurs="0"/>
    <xs:element name="seedOrientCode" type="string30" minOccurs="0"/>
    <xs:element name="sensitivity" type="string255" minOccurs="0"/>
    <xs:element name="depth" type="float" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Volcanoes list -->
<xs:complexType name="VolcanoesType">
  <xs:sequence>
    <xs:element name="volcanoCode" maxOccurs="unbounded">
      <xs:complexType>
        <xs:simpleContent>
          <xs:extension base="string30">
            <xs:attribute name="number" type="xs:integer"/>
          </xs:extension>
        </xs:simpleContent>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<!-- Volcano code -->
<xs:complexType name="VolcanoCodeType">

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```

<xs:sequence>
    <xs:element name="volcanoCode" type="string30" maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>

<!-- Data -->
<xs:complexType name="DataType">
    <xs:sequence>
        <!-- Deformation -->
        <xs:element name="Deformation" type="DeformationType" minOccurs="0"/>
        <!-- Gas -->
        <xs:element name="Gas" type="GasType" minOccurs="0"/>
        <!-- Hydrologic -->
        <xs:element name="Hydrologic" type="HydrologicType" minOccurs="0"/>
        <!-- Fields -->
        <xs:element name="Fields" type="FieldsType" minOccurs="0"/>
        <!-- Thermal -->
        <xs:element name="Thermal" type="ThermalType" minOccurs="0"/>
        <!-- Meteo -->
        <xs:element name="Meteo" type="MeteoType" minOccurs="0"/>
        <!-- Seismic -->
        <xs:element name="Seismic" type="SeismicType" minOccurs="0"/>
    </xs:sequence>
</xs:complexType>

<!-- Deformation -->
<xs:complexType name="DeformationType">
    <xs:sequence>
        <!-- Electronic tilt dataset -->
        <xs:element name="ElectronicTiltDataset" type="ElectronicTiltDatasetType" minOccurs="0" maxOccurs="unbounded"/>
        <!-- Tilt vector dataset -->
        <xs:element name="TiltVectorDataset" type="TiltVectorDatasetType" minOccurs="0" maxOccurs="unbounded"/>
        <!-- Strain dataset -->
        <xs:element name="StrainDataset" type="StrainDatasetType" minOccurs="0" maxOccurs="unbounded"/>
        <!-- EDM dataset -->
        <xs:element name="EDMDataset" type="EDMDatasetType" minOccurs="0" maxOccurs="unbounded"/>
        <!-- Angle dataset -->
        <xs:element name="AngleDataset" type="AngleDatasetType" minOccurs="0" maxOccurs="unbounded"/>
        <!-- GPS dataset -->
        <xs:element name="GPSDataset" type="GPSDatasetType" minOccurs="0" maxOccurs="unbounded"/>
        <!-- GPS vector dataset -->
        <xs:element name="GPSVectorDataset" type="GPSVectorDatasetType" minOccurs="0" maxOccurs="unbounded"/>
        <!-- Leveling dataset -->
        <xs:element name="LevelingDataset" type="LevelingDatasetType" minOccurs="0" maxOccurs="unbounded"/>
        <!-- InSAR image dataset -->
        <xs:element name="InSARImageDataset" type="InSARImageDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Electronic tilt dataset -->
<xs:complexType name="ElectronicTiltDatasetType">
    <xs:sequence>
        <!-- Electronic tilt -->
        <xs:element name="ElectronicTilt" type="ElectronicTiltType" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Electronic tilt -->
<xs:complexType name="ElectronicTiltType">

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```

<xs:sequence>
    <xs:element name="measTime" type="dateTimemsec"/>
    <xs:element name="measTimeCsec" type="decimal" minOccurs="0"/>
    <xs:element name="measTimeUnc" type="dateTimeUncmsec" minOccurs="0"/>
    <xs:element name="measTimeCsecUnc" type="decimal" minOccurs="0"/>
    <xs:element name="sampleRate" type="double" minOccurs="0"/>
    <xs:element name="tilt1" type="double" minOccurs="0"/>
    <xs:element name="tilt2" type="double" minOccurs="0"/>
    <xs:element name="tilt1Unc" type="double" minOccurs="0"/>
    <xs:element name="tilt2Unc" type="double" minOccurs="0"/>
    <xs:element name="processed" type="processedEnum" minOccurs="0"/>
    <xs:element name="temperature" type="double" minOccurs="0"/>
    <xs:element name="battery" type="double" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Tilt vector dataset -->
<xs:complexType name="TiltVectorDatasetType">
    <xs:sequence>
        <!-- Tilt vector -->
        <xs:element name="TiltVector" type="TiltVectorType" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Tilt vector -->
<xs:complexType name="TiltVectorType">
    <xs:sequence>
        <xs:element name="startTime" type="dateTime"/>
        <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
        <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
        <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
        <xs:element name="magnitude" type="float" minOccurs="0"/>
        <xs:element name="azimuth" type="deg0-360" minOccurs="0"/>
        <xs:element name="magnitudeUnc" type="float" minOccurs="0"/>
        <xs:element name="azimuthUnc" type="float" minOccurs="0"/>
        <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
        <xs:element name="comments" type="string255" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="code" type="string30NE" use="required"/>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Strain dataset -->
<xs:complexType name="StrainDatasetType">
    <xs:sequence>
        <!-- Strain -->
        <xs:element name="Strain" type="StrainType" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

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<!-- Strain -->
<xs:complexType name="StrainType">
  <xs:sequence>
    <xs:element name="measTime" type="dateTime"/>
    <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="component1" type="double" minOccurs="0"/>
    <xs:element name="component2" type="double" minOccurs="0"/>
    <xs:element name="component3" type="double" minOccurs="0"/>
    <xs:element name="component4" type="double" minOccurs="0"/>
    <xs:element name="component1Unc" type="double" minOccurs="0"/>
    <xs:element name="component2Unc" type="double" minOccurs="0"/>
    <xs:element name="component3Unc" type="double" minOccurs="0"/>
    <xs:element name="component4Unc" type="double" minOccurs="0"/>
    <xs:element name="volumetricStrain" type="double" minOccurs="0"/>
    <xs:element name="volumetricStrainUnc" type="double" minOccurs="0"/>
    <xs:element name="shearStrainAxis1" type="double" minOccurs="0"/>
    <xs:element name="azimuthAxis1" type="deg0-360" minOccurs="0"/>
    <xs:element name="shearStrainAxis2" type="double" minOccurs="0"/>
    <xs:element name="azimuthAxis2" type="deg0-360" minOccurs="0"/>
    <xs:element name="shearStrainAxis3" type="double" minOccurs="0"/>
    <xs:element name="azimuthAxis3" type="deg0-360" minOccurs="0"/>
    <xs:element name="shearStrainAxis1Unc" type="double" minOccurs="0"/>
    <xs:element name="shearStrainAxis2Unc" type="double" minOccurs="0"/>
    <xs:element name="shearStrainAxis3Unc" type="double" minOccurs="0"/>
    <xs:element name="maxPrincipalStrain" type="double" minOccurs="0"/>
    <xs:element name="maxPrincipalStrainUnc" type="double" minOccurs="0"/>
    <xs:element name="minPrincipalStrain" type="double" minOccurs="0"/>
    <xs:element name="minPrincipalStrainUnc" type="double" minOccurs="0"/>
    <xs:element name="maxPrincipalStrainDir" type="deg0-360" minOccurs="0"/>
    <xs:element name="maxPrincipalStrainDirUnc" type="float" minOccurs="0"/>
    <xs:element name="minPrincipalStrainDir" type="deg0-360" minOccurs="0"/>
    <xs:element name="minPrincipalStrainDirUnc" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- EDM dataset -->
<xs:complexType name="EDMDatasetType">
  <xs:sequence>
    <!-- EDM -->
    <xs:element name="EDM" type="EDMType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attribute name="targetStation" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- EDM -->
<xs:complexType name="EDMType">
  <xs:sequence>
    <xs:element name="measTime" type="dateTime"/>
    <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="lineLength" type="double" minOccurs="0"/>
    <xs:element name="constantErr" type="float" minOccurs="0"/>
    <xs:element name="scaleErr" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

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        <xs:element name="comments" type="string255" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="code" type="string30NE" use="required"/>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attribute name="targetStation" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Angle dataset -->
<xs:complexType name="AngleDatasetType">
    <xs:sequence>
        <!-- Angle -->
        <xs:element name="Angle" type="AngleType" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attribute name="targetStation1" type="string30NE"/>
    <xs:attribute name="targetStation2" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Angle -->
<xs:complexType name="AngleType">
    <xs:sequence>
        <xs:element name="measTime" type="dateTime"/>
        <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
        <xs:element name="hAngle1" type="deg0-360" minOccurs="0"/>
        <xs:element name="hAngle2" type="deg0-360" minOccurs="0"/>
        <xs:element name="vAngle1" type="deg-90-90" minOccurs="0"/>
        <xs:element name="vAngle2" type="deg-90-90" minOccurs="0"/>
        <xs:element name="hAngle1Unc" type="float" minOccurs="0"/>
        <xs:element name="hAngle2Unc" type="float" minOccurs="0"/>
        <xs:element name="vAngle1Unc" type="float" minOccurs="0"/>
        <xs:element name="vAngle2Unc" type="float" minOccurs="0"/>
        <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
        <xs:element name="comments" type="string255" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="code" type="string30NE" use="required"/>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attribute name="targetStation1" type="string30NE"/>
    <xs:attribute name="targetStation2" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- GPS dataset -->
<xs:complexType name="GPSSDatasetType">
    <xs:sequence>
        <!-- GPS -->
        <xs:element name="GPS" type="GPSType" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attribute name="refStation1" type="string30NE"/>
    <xs:attribute name="refStation2" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- GPS -->
<xs:complexType name="GPSType">
    <xs:sequence>
        <xs:element name="measTime" type="dateTime"/>

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<xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:group ref="latLonGroup" minOccurs="0"/>
<xs:element name="elev" type="double" minOccurs="0"/>
<xs:element name="N-SErr" type="double" minOccurs="0"/>
<xs:element name="E-WErr" type="double" minOccurs="0"/>
<xs:element name="verticalErr" type="float" minOccurs="0"/>
<xs:element name="software" type="string50" minOccurs="0"/>
<xs:element name="orbits" type="string255" minOccurs="0"/>
<xs:element name="duration" type="string255" minOccurs="0"/>
<xs:element name="quality" type="qualityEnum" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="refStation1" type="string30NE"/>
<xs:attribute name="refStation2" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="GPSVectorDatasetType">
<xs:sequence>
    <!-- GPS vector -->
    <xs:element name="GPSVector" type="GPSVectorType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="GPSVectorType">
<xs:sequence>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="magnitude" type="float" minOccurs="0"/>
    <xs:element name="azimuth" type="deg0-360" minOccurs="0"/>
    <xs:element name="inclination" type="deg0-90" minOccurs="0"/>
    <xs:element name="northDispl" type="float" minOccurs="0"/>
    <xs:element name="eastDispl" type="float" minOccurs="0"/>
    <xs:element name="vertDispl" type="float" minOccurs="0"/>
    <xs:element name="magnitudeErr" type="float" minOccurs="0"/>
    <xs:element name="northDisplErr" type="float" minOccurs="0"/>
    <xs:element name="eastDisplErr" type="float" minOccurs="0"/>
    <xs:element name="vertDisplErr" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="LevelingDatasetType">
<xs:sequence>
    <!-- Leveling -->
    <xs:element name="Leveling" type="LevelingType" maxOccurs="unbounded"/>

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</xs:sequence>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="refStation" type="string30NE"/>
<xs:attribute name="firstBMStation" type="string30NE"/>
<xs:attribute name="secondBMStation" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Leveling -->
<xs:complexType name="LevelingType">
  <xs:sequence>
    <xs:element name="order" type="xs:integer" minOccurs="0"/>
    <xs:element name="class" type="string30" minOccurs="0"/>
    <xs:element name="measTime" type="dateTime"/>
    <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="elevChange" type="float" minOccurs="0"/>
    <xs:element name="elevChangeUnc" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="refStation" type="string30NE"/>
  <xs:attribute name="firstBMStation" type="string30NE"/>
  <xs:attribute name="secondBMStation" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- InSAR image dataset -->
<xs:complexType name="InSARImageDatasetType">
  <xs:sequence>
    <!-- InSAR image -->
    <xs:element name="InSARImage" type="InSARImageType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="satellite" type="string30NE"/>
  <xs:attribute name="volcano" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- InSAR image -->
<xs:complexType name="InSARImageType">
  <xs:sequence>
    <xs:group ref="startLatLonGroup" minOccurs="0"/>
    <xs:element name="startPosition" type="startPositionEnum" minOccurs="0"/>
    <xs:element name="rowOrder" type="string30" minOccurs="0"/>
    <xs:element name="numbOfRows" type="xs:integer" minOccurs="0"/>
    <xs:element name="numbOfCols" type="xs:integer" minOccurs="0"/>
    <xs:element name="units" type="string30" minOccurs="0"/>
    <xs:element name="nullValue" type="string30" minOccurs="0"/>
    <xs:element name="location" type="string255" minOccurs="0"/>
    <xs:element name="pair" type="pairStackedEnum" minOccurs="0"/>
    <xs:element name="description" type="string255" minOccurs="0"/>
    <xs:element name="DEM" type="string50" minOccurs="0"/>
    <xs:element name="bytesOrder" type="string30" minOccurs="0"/>
    <xs:element name="img1Time" type="dateTime"/>
    <xs:element name="img1TimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="img2Time" type="dateTime"/>
    <xs:element name="img2TimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="metersPixelSize" type="float" minOccurs="0"/>
    <xs:element name="degreesPixelSize" type="float" minOccurs="0"/>
    <xs:element name="lookAngle" type="float" minOccurs="0"/>
    <xs:element name="limb" type="limbEnum" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

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<xs:element name="imagepath" type="string255" minOccurs="0"/>
<xs:element name="geotiff" type="string255" minOccurs="0"/>
<xs:element name="processMethod" type="string255" minOccurs="0"/>
<xs:element name="software" type="string255" minOccurs="0"/>
<xs:element name="DEMQuality" type="DEMQualityEnum" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
<!-- InSAR image pixels -->
<xs:element name="InSARPixels" type="InSARPixelsType" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="satellite" type="string30NE"/>
<xs:attribute name="volcano" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- InSAR pixels -->
<xs:complexType name="InSARPixelsType">
  <xs:sequence>
    <!-- InSAR image pixel -->
    <xs:element name="InSARPixel" type="InSARPixelType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<!-- InSAR pixel -->
<xs:complexType name="InSARPixelType">
  <xs:sequence>
    <xs:element name="rangeOfChange" type="float"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="number" type="xs:integer" use="required"/>
</xs:complexType>

<!-- Gas -->
<xs:complexType name="GasType">
  <xs:sequence>
    <!-- Gas sample dataset -->
    <xs:element name="GasSampleDataset" type="GasSampleDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Soil efflux dataset -->
    <xs:element name="SoilEffluxDataset" type="SoilEffluxDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Plume dataset -->
    <xs:element name="PlumeDataset" type="PlumeDatasetType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gas sample dataset -->
<xs:complexType name="GasSampleDatasetType">
  <xs:sequence>
    <!-- Gas sample -->
    <xs:element name="GasSample" type="GasSampleType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gas sample -->
<xs:complexType name="GasSampleType">
  <xs:sequence>
    <!-- Gas species -->
    <xs:element name="GasSpecies" type="GasSpeciesType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

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<xs:element name="measTime" type="dateTime"/>
<xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="temperature" type="float" minOccurs="0"/>
<xs:element name="atmosPress" type="float" minOccurs="0"/>
<xs:element name="emissionRate" type="float" minOccurs="0"/>
<xs:element name="environFactors" type="string255" minOccurs="0"/>
<xs:element name="sublimateMinerals" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="GasSpeciesType">
  <xs:sequence>
    <xs:element name="concentration" type="float" minOccurs="0"/>
    <xs:element name="concentrationUnc" type="float" minOccurs="0"/>
    <xs:element name="units" type="string30" minOccurs="0"/>
    <xs:element name="recalculated" type="oriRecalEnum" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="type" type="gasSpeciesEnum" use="required"/>
  <xs:attribute name="waterFree" type="yesNoEnum" use="required"/>
</xs:complexType>


<xs:complexType name="SoilEffluxDatasetType">
  <xs:sequence>
    <!-- Gas sample -->
    <xs:element name="SoilEfflux" type="SoilEffluxType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="SoilEffluxType">
  <xs:sequence>
    <xs:element name="measTime" type="dateTime"/>
    <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="species" type="string30" minOccurs="0"/>
    <xs:element name="totalFlux" type="float" minOccurs="0"/>
    <xs:element name="totalFluxUnc" type="float" minOccurs="0"/>
    <xs:element name="numberOfPoints" type="xs:integer" minOccurs="0"/>
    <xs:element name="area" type="float" minOccurs="0"/>
    <xs:element name="highestFlux" type="float" minOccurs="0"/>
    <xs:element name="highestTemp" type="float" minOccurs="0"/>
    <xs:element name="reportedUnits" type="string30" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="PlumeDatasetType">

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```

<xs:sequence>
    <!-- Plume -->
    <xs:element name="Plume" type="PlumeType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="volcano" type="string12NE"/>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="airplane" type="string30NE"/>
<xs:attribute name="satellite" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Plume -->
<xs:complexType name="PlumeType">
    <xs:sequence>
        <!-- Plume species -->
        <xs:element name="PlumeSpecies" type="PlumeSpeciesType" maxOccurs="unbounded"/>
        <xs:group ref="latLonGroup" minOccurs="0"/>
        <xs:element name="height" type="float" minOccurs="0"/>
        <xs:element name="heightDetermination" type="string255" minOccurs="0"/>
        <xs:element name="measTime" type="dateTime"/>
        <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
        <xs:element name="windSpeed" type="float" minOccurs="0"/>
        <xs:element name="minWindSpeed" type="float" minOccurs="0"/>
        <xs:element name="maxWindSpeed" type="float" minOccurs="0"/>
        <xs:element name="windDirection" type="string30" minOccurs="0"/>
        <xs:element name="weatherNotes" type="string255" minOccurs="0"/>
        <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
        <xs:element name="comments" type="string255" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="code" type="string30NE" use="required"/>
    <xs:attribute name="volcano" type="string12NE"/>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attribute name="airplane" type="string30NE"/>
    <xs:attribute name="satellite" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Plume species -->
<xs:complexType name="PlumeSpeciesType">
    <xs:sequence>
        <xs:element name="emissionRate" type="float" minOccurs="0"/>
        <xs:element name="emissionRateUnc" type="float" minOccurs="0"/>
        <xs:element name="units" type="string30" minOccurs="0"/>
        <xs:element name="recalculated" type="oriRecalEnum" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="type" type="plumeSpeciesEnum" use="required"/>
</xs:complexType>

<!-- Hydrologic -->
<xs:complexType name="HydrologicType">
    <xs:sequence>
        <!-- Hydrologic sample dataset -->
        <xs:element name="HydrologicSampleDataset" type="HydrologicSampleDatasetType" minOccurs="0" maxOccurs="un-
bounded"/>
    </xs:sequence>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Hydrologic sample dataset -->
<xs:complexType name="HydrologicSampleDatasetType">
    <xs:sequence>

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<!-- Hydrologic sample -->
<xs:element name="HydrologicSample" type="HydrologicSampleType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Hydrologic sample -->
<xs:complexType name="HydrologicSampleType">
<xs:sequence>
    <!-- Hydrologic species -->
    <xs:element name="HydrologicSpecies" type="HydrologicSpeciesType" maxOccurs="unbounded"/>
    <xs:element name="measTime" type="dateTime"/>
    <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="temperature" type="float" minOccurs="0"/>
    <xs:element name="elev" type="double" minOccurs="0"/>
    <xs:element name="depth" type="double" minOccurs="0"/>
    <xs:element name="waterLevelChange" type="double" minOccurs="0"/>
    <xs:element name="atmosPress" type="float" minOccurs="0"/>
    <xs:element name="springDischRate" type="double" minOccurs="0"/>
    <xs:element name="precipitation" type="float" minOccurs="0"/>
    <xs:element name="dailyPrecipitation" type="float" minOccurs="0"/>
    <xs:element name="precipitationType" type="precipitationTypeEnum" minOccurs="0"/>
    <xs:element name="pH" type="float" minOccurs="0"/>
    <xs:element name="pHUnc" type="float" minOccurs="0"/>
    <xs:element name="conductivity" type="float" minOccurs="0"/>
    <xs:element name="conductivityUnc" type="float" minOccurs="0"/>
    <xs:element name="airTemp" type="float" minOccurs="0"/>
    <xs:element name="totalDissolvedSolid" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Hydrologic species -->
<xs:complexType name="HydrologicSpeciesType">
<xs:sequence>
    <xs:element name="content" type="float" minOccurs="0"/>
    <xs:element name="contentUnc" type="float" minOccurs="0"/>
    <xs:element name="units" type="string30" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="type" type="hydroSpeciesEnum" use="required"/>
</xs:complexType>

<!-- Fields -->
<xs:complexType name="FieldsType">
<xs:sequence>
    <!-- Magnetic dataset -->
    <xs:element name="MagneticDataset" type="MagneticDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Magnetic vector dataset -->
    <xs:element name="MagneticVectorDataset" type="MagneticVectorDatasetType" minOccurs="0" maxOccurs="unboun-
ded"/>
    <!-- Electric dataset -->
    <xs:element name="ElectricDataset" type="ElectricDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Gravity dataset -->
    <xs:element name="GravityDataset" type="GravityDatasetType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>

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<!-- Magnetic dataset -->
<xs:complexType name="MagneticDatasetType">
  <xs:sequence>
    <!-- Magnetic -->
    <xs:element name="Magnetic" type="MagneticType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attribute name="refStation" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Magnetic -->
<xs:complexType name="MagneticType">
  <xs:sequence>
    <xs:element name="measTime" type="dateTime"/>
    <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="F" type="double" minOccurs="0"/>
    <xs:element name="X" type="double" minOccurs="0"/>
    <xs:element name="Y" type="double" minOccurs="0"/>
    <xs:element name="Z" type="double" minOccurs="0"/>
    <xs:element name="FUnc" type="float" minOccurs="0"/>
    <xs:element name="XUnc" type="float" minOccurs="0"/>
    <xs:element name="YUnc" type="float" minOccurs="0"/>
    <xs:element name="ZUnc" type="float" minOccurs="0"/>
    <xs:element name="highPass" type="float" minOccurs="0"/>
    <xs:element name="lowPass" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attribute name="refStation" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Magnetic vector dataset -->
<xs:complexType name="MagneticVectorDatasetType">
  <xs:sequence>
    <!-- Magnetic vector -->
    <xs:element name="MagneticVector" type="MagneticVectorType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Magnetic vector -->
<xs:complexType name="MagneticVectorType">
  <xs:sequence>
    <xs:element name="measTime" type="dateTime"/>
    <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="declination" type="deg0-360" minOccurs="0"/>
    <xs:element name="inclination" type="deg0-90" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

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</xs:complexType>

<!-- Electric dataset -->
<xs:complexType name="ElectricDatasetType">
  <xs:sequence>
    <!-- Electric -->
    <xs:element name="Electric" type="ElectricType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="refStation1" type="string30NE"/>
  <xs:attribute name="refStation2" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Electric -->
<xs:complexType name="ElectricType">
  <xs:sequence>
    <xs:element name="measTime" type="dateTime"/>
    <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="field" type="float" minOccurs="0"/>
    <xs:element name="fieldUnc" type="float" minOccurs="0"/>
    <xs:element name="direction" type="deg0-360" minOccurs="0"/>
    <xs:element name="highPass" type="float" minOccurs="0"/>
    <xs:element name="lowPass" type="float" minOccurs="0"/>
    <xs:element name="selfPotential" type="float" minOccurs="0"/>
    <xs:element name="selfPotentialUnc" type="float" minOccurs="0"/>
    <xs:element name="apparentResistivity" type="float" minOccurs="0"/>
    <xs:element name="apparentResistivityUnc" type="float" minOccurs="0"/>
    <xs:element name="directResistivity" type="float" minOccurs="0"/>
    <xs:element name="directResistivityUnc" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="refStation1" type="string30NE"/>
  <xs:attribute name="refStation2" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gravity dataset -->
<xs:complexType name="GravityDatasetType">
  <xs:sequence>
    <!-- Gravity -->
    <xs:element name="Gravity" type="GravityType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="refStation1" type="string30NE"/>
  <xs:attribute name="refStation2" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Gravity -->
<xs:complexType name="GravityType">
  <xs:sequence>
    <xs:element name="measTime" type="dateTime"/>
    <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="fieldStrength" type="double" minOccurs="0"/>
    <xs:element name="fieldStrengthUnc" type="double" minOccurs="0"/>
    <xs:element name="assocVertDispl" type="string255" minOccurs="0"/>
    <xs:element name="assocGWaterLevel" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

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</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="refStation" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Thermal -->
<xs:complexType name="ThermalType">
  <xs:sequence>
    <!-- Ground-based dataset -->
    <xs:element name="Ground-basedDataset" type="GroundBasedDatasetType" minOccurs="0" maxOccurs="unbounded"/>
      <!-- Thermal image dataset -->
      <xs:element name="ThermalImageDataset" type="ThermalImageDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>

  <!-- Ground-based dataset -->
  <xs:complexType name="GroundBasedDatasetType">
    <xs:sequence>
      <!-- Ground-based -->
      <xs:element name="Ground-based" type="GroundBasedType" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
  </xs:complexType>

  <!-- Ground-based -->
  <xs:complexType name="GroundBasedType">
    <xs:sequence>
      <xs:element name="measType" type="string255" minOccurs="0"/>
      <xs:element name="measTime" type="dateTime"/>
      <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
      <xs:element name="measDepth" type="float" minOccurs="0"/>
      <xs:element name="distance" type="float" minOccurs="0"/>
      <xs:element name="recalculated" type="oriRecalEnum" minOccurs="0"/>
      <xs:element name="temperature" type="float" minOccurs="0"/>
      <xs:element name="temperatureUnc" type="float" minOccurs="0"/>
      <xs:element name="area" type="float" minOccurs="0"/>
      <xs:element name="heatFlux" type="float" minOccurs="0"/>
      <xs:element name="heatFluxUnc" type="float" minOccurs="0"/>
      <xs:element name="bgGeothermGradient" type="float" minOccurs="0"/>
      <xs:element name="conductivity" type="float" minOccurs="0"/>
      <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
      <xs:element name="comments" type="string255" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="code" type="string30NE" use="required"/>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
  </xs:complexType>

  <!-- Thermal image dataset -->
  <xs:complexType name="ThermalImageDatasetType">
    <xs:sequence>
      <!-- Thermal image -->
      <xs:element name="ThermalImage" type="ThermalImageType" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="volcano" type="string12NE"/>
  </xs:complexType>

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<xs:attribute name="instrument" type="string30NE"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="airplane" type="string30NE"/>
<xs:attribute name="satellite" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Thermal image -->
<xs:complexType name="ThermalImageType">
    <xs:sequence>
        <xs:element name="instPlatform" type="string255" minOccurs="0"/>
        <xs:element name="instAlt" type="float" minOccurs="0"/>
        <xs:group ref="instLatLonGroup" minOccurs="0"/>
        <xs:element name="datum" type="string30" minOccurs="0"/>
        <xs:element name="description" type="string255" minOccurs="0"/>
        <xs:element name="time" type="dateTime"/>
        <xs:element name="timeUnc" type="dateTimeUnc" minOccurs="0"/>
        <xs:element name="bandName" type="string255" minOccurs="0"/>
        <xs:element name="highBandWavelength" type="float" minOccurs="0"/>
        <xs:element name="lowBandWavelength" type="float" minOccurs="0"/>
        <xs:element name="imagepath" type="string255" minOccurs="0"/>
        <xs:element name="pixelSize" type="float" minOccurs="0"/>
        <xs:element name="maxRadiance" type="float" minOccurs="0"/>
        <xs:element name="maxRelativeRadiance" type="float" minOccurs="0"/>
        <xs:element name="hottestPixelTemp" type="float" minOccurs="0"/>
        <xs:element name="totRadiance" type="float" minOccurs="0"/>
        <xs:element name="maxHeatFlux" type="float" minOccurs="0"/>
        <xs:element name="nominalTempRes" type="float" minOccurs="0"/>
        <xs:element name="atmosCorrection" type="string255" minOccurs="0"/>
        <xs:element name="thermCorrection" type="string255" minOccurs="0"/>
        <xs:element name="orthorecProc" type="string255" minOccurs="0"/>
        <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
        <xs:element name="comments" type="string255" minOccurs="0"/>
        <!-- Thermal image pixels -->
        <xs:element name="ThermalPixels" type="ThermalPixelsType" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="code" type="string30NE" use="required"/>
    <xs:attribute name="volcano" type="string12NE"/>
    <xs:attribute name="instrument" type="string30NE"/>
    <xs:attribute name="station" type="string30NE"/>
    <xs:attribute name="satellite" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Thermal pixels -->
<xs:complexType name="ThermalPixelsType">
    <xs:sequence>
        <!-- Thermal image pixel -->
        <xs:element name="ThermalPixel" type="ThermalPixelType" maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>

<!-- Thermal pixel -->
<xs:complexType name="ThermalPixelType">
    <xs:sequence>
        <xs:element name="elev" type="float" minOccurs="0"/>
        <xs:group ref="latLonGroup"/>
        <xs:element name="radiance" type="float" minOccurs="0"/>
        <xs:element name="heatFlux" type="float" minOccurs="0"/>
        <xs:element name="temperature" type="float" minOccurs="0"/>
        <xs:element name="comments" type="string255" minOccurs="0"/>
    </xs:sequence>
</xs:complexType>

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<!-- Meteo -->
<xs:complexType name="MeteoType">
  <xs:sequence>
    <!-- Meteo dataset -->
    <xs:element name="MeteoDataset" type="MeteoDatasetType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Meteo dataset -->
<xs:complexType name="MeteoDatasetType">
  <xs:sequence>
    <!-- Meteo -->
    <xs:element name="MeteoData" type="MeteoDataType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Meteo -->
<xs:complexType name="MeteoDataType">
  <xs:sequence>
    <xs:element name="measTime" type="dateTime"/>
    <xs:element name="measTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="airTemp" type="float" minOccurs="0"/>
    <xs:element name="soilTemp" type="float" minOccurs="0"/>
    <xs:element name="baroPress" type="float" minOccurs="0"/>
    <xs:element name="dailyPrecipitation" type="float" minOccurs="0"/>
    <xs:element name="precipitationType" type="precipitationTypeEnum" minOccurs="0"/>
    <xs:element name="humidity" type="float" minOccurs="0"/>
    <xs:element name="windSpeed" type="float" minOccurs="0"/>
    <xs:element name="minWindSpeed" type="float" minOccurs="0"/>
    <xs:element name="maxWindSpeed" type="float" minOccurs="0"/>
    <xs:element name="windDirection" type="string30" minOccurs="0"/>
    <xs:element name="cloudCoverage" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="instrument" type="string30NE"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Seismic -->
<xs:complexType name="SeismicType">
  <xs:sequence>
    <!-- Network event dataset -->
    <xs:element name="NetworkEventDataset" type="NetworkEventDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Single station event dataset -->
    <xs:element name="SingleStationEventDataset" type="SingleStationEventDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Intensity dataset -->
    <xs:element name="IntensityDataset" type="IntensityDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Tremor dataset -->
    <xs:element name="TremorDataset" type="TremorDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- Interval dataset -->
    <xs:element name="IntervalDataset" type="IntervalDatasetType" minOccurs="0" maxOccurs="unbounded"/>
    <!-- RSAM-SSAM dataset -->
  </xs:sequence>

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<xs:element name="RSAM-SSAMDataset" type="RSAM-SSAMDatasetType" minOccurs="0" maxOc-
curs="unbounded"/>
    <!-- WAVEFORM dataset -->
    <xs:element name="WaveformDataset" type="WaveformDatasetType" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>

<!-- Network event dataset -->
<xs:complexType name="NetworkEventDatasetType">
    <xs:sequence>
        <!-- Network event -->
        <xs:element name="NetworkEvent" type="NetworkEventType" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="network" type="string30NE"/>
    <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Network event -->
<xs:complexType name="NetworkEventType">
    <xs:sequence>
        <xs:element name="seismoArchive" type="string255" minOccurs="0"/>
        <xs:element name="originTime" type="dateTimemsec"/>
        <xs:element name="originTimeCsec" type="decimal" minOccurs="0"/>
        <xs:element name="originTimeUnc" type="dateTimeUncmsec" minOccurs="0"/>
        <xs:element name="originTimeCsecUnc" type="decimal" minOccurs="0"/>
        <xs:element name="duration" type="float" minOccurs="0"/>
        <xs:element name="durationUnc" type="float" minOccurs="0"/>
        <xs:element name="locaTechnique" type="string255" minOccurs="0"/>
        <xs:element name="picksDetermination" type="picksDeterminationEnum" minOccurs="0"/>
        <xs:group ref="latLonGroup" minOccurs="0"/>
        <xs:element name="depth" type="float" minOccurs="0"/>
        <xs:element name="fixedDepth" type="yesNoUnkEnum" minOccurs="0"/>
        <xs:element name="numberOfStations" type="xs:integer" minOccurs="0"/>
        <xs:element name="numberOfPhases" type="xs:integer" minOccurs="0"/>
        <xs:element name="largestAzimuthGap" type="deg0-360" minOccurs="0"/>
        <xs:element name="distClosestStation" type="float" minOccurs="0"/>
        <xs:element name="travelTimeRMS" type="float" minOccurs="0"/>
        <xs:element name="horizLocaErr" type="float" minOccurs="0"/>
        <xs:element name="maxLonErr" type="xs:float" minOccurs="0"/>
        <xs:element name="maxLatErr" type="xs:float" minOccurs="0"/>
        <xs:element name="depthErr" type="float" minOccurs="0"/>
        <xs:element name="locaQuality" type="string255" minOccurs="0"/>
        <xs:element name="primMagnitude" type="float" minOccurs="0"/>
        <xs:element name="primMagnitudeType" type="string30" minOccurs="0"/>
        <xs:element name="secMagnitude" type="float" minOccurs="0"/>
        <xs:element name="secMagnitudeType" type="string30" minOccurs="0"/>
        <xs:element name="earthquakeType" type="eqTypeEnum" minOccurs="0"/>
        <xs:group ref="momentTensorGroup" minOccurs="0"/>
        <xs:element name="strike1" type="deg0-360" minOccurs="0"/>
        <xs:element name="strike1Unc" type="float" minOccurs="0"/>
        <xs:element name="dip1" type="deg0-90" minOccurs="0"/>
        <xs:element name="dip1Unc" type="float" minOccurs="0"/>
        <xs:element name="rake1" type="deg-180-180" minOccurs="0"/>
        <xs:element name="rake1Unc" type="float" minOccurs="0"/>
        <xs:element name="strike2" type="deg0-360" minOccurs="0"/>
        <xs:element name="strike2Unc" type="float" minOccurs="0"/>
        <xs:element name="dip2" type="deg0-90" minOccurs="0"/>
        <xs:element name="dip2Unc" type="float" minOccurs="0"/>
        <xs:element name="rake2" type="deg-180-180" minOccurs="0"/>
        <xs:element name="rake2Unc" type="float" minOccurs="0"/>
        <xs:element name="focalPlaneSol" type="string255" minOccurs="0"/>
        <xs:element name="sampleRate" type="float" minOccurs="0"/>
        <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    </xs:sequence>
</xs:complexType>

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<xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Single station event dataset -->
<xs:complexType name="SingleStationEventDatasetType">
  <xs:sequence>
    <!-- Single station event -->
    <xs:element name="SingleStationEvent" type="SingleStationEventType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Single station event -->
<xs:complexType name="SingleStationEventType">
  <xs:sequence>
    <xs:element name="startTime" type="dateTimemsec"/>
    <xs:element name="startTimeCsec" type="decimal" minOccurs="0"/>
    <xs:element name="startTimeUnc" type="dateTimeUncmsec" minOccurs="0"/>
    <xs:element name="startTimeCsecUnc" type="decimal" minOccurs="0"/>
    <xs:element name="picksDetermination" type="picksDeterminationEnum" minOccurs="0"/>
    <xs:element name="SPLInterval" type="float" minOccurs="0"/>
    <xs:element name="duration" type="float" minOccurs="0"/>
    <xs:element name="durationUnc" type="float" minOccurs="0"/>
    <xs:element name="distActiveVent" type="float" minOccurs="0"/>
    <xs:element name="maxAmplitude" type="float" minOccurs="0"/>
    <xs:element name="sampleRate" type="float" minOccurs="0"/>
    <xs:element name="earthquakeType" type="eqTypeEnum" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="code" type="string30NE" use="required"/>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Intensity dataset -->
<xs:complexType name="IntensityDatasetType">
  <xs:sequence>
    <!-- Intensity -->
    <xs:element name="Intensity" type="IntensityType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="volcano" type="string12NE"/>
  <xs:attribute name="networkEvent" type="string30NE"/>
  <xs:attribute name="singleStationEvent" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Intensity -->
<xs:complexType name="IntensityType">
  <xs:sequence>
    <xs:element name="time" type="dateTime"/>
    <xs:element name="timeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="city" type="string30" minOccurs="0"/>
    <xs:element name="maxDistance" type="float" minOccurs="0"/>
    <xs:element name="maxReported" type="float" minOccurs="0"/>
    <xs:element name="distMaxReported" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

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```

</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="volcano" type="string12NE"/>
<xs:attribute name="networkEvent" type="string30NE"/>
<xs:attribute name="singleStationEvent" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Tremor dataset -->
<xs:complexType name="TremorDatasetType">
<xs:sequence>
    <!-- Tremor -->
    <xs:element name="Tremor" type="TremorType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Tremor -->
<xs:complexType name="TremorType">
<xs:sequence>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="durationPerDay" type="float" minOccurs="0"/>
    <xs:element name="durationPerDayUnc" type="float" minOccurs="0"/>
    <xs:element name="type" type="trmTypeEnum" minOccurs="0"/>
    <xs:element name="qualitativeDepth" type="qualitativeDepthEnum" minOccurs="0"/>
    <xs:element name="dominantFreq" type="float" minOccurs="0"/>
    <xs:element name="secondDominantFreq" type="float" minOccurs="0"/>
    <xs:element name="maxAmplitude" type="float" minOccurs="0"/>
    <xs:element name="backgroundNoise" type="float" minOccurs="0"/>
    <xs:element name="reducedDisp" type="float" minOccurs="0"/>
    <xs:element name="reducedDispUnc" type="float" minOccurs="0"/>
    <xs:element name="visibleActivity" type="string255" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Interval dataset -->
<xs:complexType name="IntervalDatasetType">
<xs:sequence>
    <!-- Interval -->
    <xs:element name="Interval" type="IntervalType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Interval -->
<xs:complexType name="IntervalType">
<xs:sequence>
    <xs:element name="earthquakeType" type="eqTypeEnum" minOccurs="0"/>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>

```

```

<xs:element name="endTime" type="dateTimeEmpty" minOccurs="0"/>
<xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="hDistSummit" type="float" minOccurs="0"/>
<xs:element name="meanDepth" type="float" minOccurs="0"/>
<xs:element name="verticalDisp" type="float" minOccurs="0"/>
<xs:element name="hypocenterHMigr" type="float" minOccurs="0"/>
<xs:element name="hypocenterVMigr" type="float" minOccurs="0"/>
<xs:element name="temporalPattern" type="string30" minOccurs="0"/>
<xs:element name="dataType" type="dataTypeEnum" minOccurs="0"/>
<xs:element name="picksDetermination" type="picksDeterminationEnum" minOccurs="0"/>
<xs:element name="feltEqCntStartTime" type="dateTime" minOccurs="0"/>
<xs:element name="feltEqCntStartTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="feltEqCntEndTime" type="dateTime" minOccurs="0"/>
<xs:element name="feltEqCntEndTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="numbOfRecEq" type="xs:integer" minOccurs="0"/>
<xs:element name="numbOfFeltEq" type="xs:integer" minOccurs="0"/>
<xs:element name="energyMeasStartTime" type="dateTime" minOccurs="0"/>
<xs:element name="energyMeasStartTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="energyMeasEndTime" type="dateTime" minOccurs="0"/>
<xs:element name="energyMeasEndTimeUnc" type="dateTimeUnc" minOccurs="0"/>
<xs:element name="energyRelease" type="float" minOccurs="0"/>
<xs:element name="minFrequency" type="float" minOccurs="0"/>
<xs:element name="maxFrequency" type="float" minOccurs="0"/>
<xs:element name="minAmplitude" type="float" minOccurs="0"/>
<xs:element name="maxAmplitude" type="float" minOccurs="0"/>
<xs:element name="description" type="string255" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="network" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="RSAM-SSAMDatasetType">
<xs:sequence>
    <!-- RSAM-SSAM -->
    <xs:element name="RSAM-SSAM" type="RSAM-SSAMType" maxOccurs="unbounded"/>
</xs:sequence>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>


<xs:complexType name="RSAM-SSAMType">
<xs:sequence>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="endTime" type="dateTime"/>
    <xs:element name="endTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="cntlInterval" type="float"/>
    <xs:element name="cntlIntervalUnc" type="float" minOccurs="0"/>
    <xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
    <xs:element name="RSAM" type="RSAMType" minOccurs="0"/>
    <xs:element name="SSAM" type="SSAMType" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

```

```

<!-- RSAM -->
<xs:complexType name="RSAMType">
  <xs:sequence>
    <!-- RSAM data -->
    <xs:element name="RSAMData" type="RSAMDataType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<!-- RSAM data -->
<xs:complexType name="RSAMDataType">
  <xs:sequence>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="cnt" type="float"/>
    <xs:element name="calibration" type="float" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

<!-- SSAM -->
<xs:complexType name="SSAMType">
  <xs:sequence>
    <!-- SSAM data -->
    <xs:element name="SSAMData" type="SSAMDataType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<!-- SSAM data -->
<xs:complexType name="SSAMDataType">
  <xs:sequence>
    <xs:element name="startTime" type="dateTime"/>
    <xs:element name="startTimeUnc" type="dateTimeUnc" minOccurs="0"/>
    <xs:element name="lowFreq" type="float"/>
    <xs:element name="highFreq" type="float"/>
    <xs:element name="cnt" type="float"/>
    <xs:element name="calibration" type="float" minOccurs="0"/>
    <xs:element name="comments" type="string255" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

<!-- Waveform dataset -->
<xs:complexType name="WaveformDatasetType">
  <xs:sequence>
    <!-- Waveform -->
    <xs:element name="Waveform" type="WaveformType" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="station" type="string30NE"/>
  <xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- Waveform -->
<xs:complexType name="WaveformType">
  <xs:sequence>
    <xs:element name="archive" type="string30" minOccurs="0"/>
    <xs:element name="link" type="string30" minOccurs="0"/>
    <xs:element name="distSummit" type="wavefromdistanceEnum" minOccurs="0"/>
    <xs:element name="image" type="string30" minOccurs="0"/>
    <xs:element name="information" type="string30" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

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```

<xs:element name="description" type="string30" minOccurs="0"/>
<xs:element name="orgDigitize" type="orgDigEnum" minOccurs="0"/>
<xs:element name="comments" type="string255" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="code" type="string30NE" use="required"/>
<xs:attribute name="station" type="string30NE"/>
<xs:attribute name="networkEvent" type="string30NE"/>
<xs:attribute name="singleStationEvent" type="string30NE"/>
<xs:attribute name="tremor" type="string30NE"/>
<xs:attributeGroup ref="OwnersPubDateGroup"/>
</xs:complexType>

<!-- ===== -->
<!-- Root element -->
<!-- ===== -->
<xs:element name="wovoml" type="wovomlType"/>

</xs:schema>

```

Appendix-3 MySQL Field Type

MySQL Field Types

MySQL supports a number of column types, which may be grouped into three categories: numeric types, date and time types, and string (character) types. This section first gives an overview of the types available. Please refer to the MySQL manuals for more details.

| Type | Use for | Size |
|--------------------------------|--|--|
| TINYINT | A very small integer | The signed range is -128 to 127. The unsigned range is 0 to 255. |
| SMALLINT | A small integer | The signed range is -32768 to 32767. The unsigned range is 0 to 65535 |
| MEDIUMINT | A medium-size integer | The signed range is -8388608 to 8388607. The unsigned range is 0 to 16777215 |
| INT or INTEGER | A normal-size integer | The signed range is -2147483648 to 2147483647. The unsigned range is 0 to 4294967295 |
| BIGINT | A large integer | The signed range is -9223372036854775808 to 9223372036854775807. The unsigned range is 0 to 18446744073709551615 |
| FLOAT | A small (single-precision) floating-point number. Cannot be unsigned | Ranges are -3.402823466E+38 to -1.175494351E-38, 0 and 1.175494351E-38 to 3.402823466E+38. If the number of Decimals is not set or <= 24 it is a single-precision floating point number |
| DOUBLE, DOUBLE PRECISION, REAL | A normal-size (double-precision) floating-point number. Cannot be unsigned | Ranges are -1.7976931348623157E+308 to -2.2250738585072014E-308, 0 and 2.2250738585072014E-308 to 1.7976931348623157E+308. If the number of Decimals is not set or 25 <= Decimals <= 53 stands for a double-precision floating point number |
| DECIMAL, NUMERIC | An unpacked floating-point number. Cannot be unsigned | Behaves like a CHAR column: "unpacked" means the number is stored as a string, using one character for each digit of the value. The decimal point, and, for negative numbers, the '-' sign is not counted in Length. If Decimals is 0, values will have no decimal point or fractional part. The maximum range of DECIMAL values is the same as for DOUBLE, but the actual range for a given DECIMAL column may be constrained by the choice of Length and Decimals. If Decimals is left out it's set to 0. If Length is left out it's set to 10. Note that in MySQL 3.22 the Length includes the sign and the decimal point |
| DATE | A date | The supported range is '1000-01-01' to '9999-12-31'. MySQL displays DATE values in 'YYYY-MM-DD' format |
| DATETIME | A date and time combination | The supported range is '1000-01-01 00:00:00' to '9999-12-31 23:59:59'. MySQL displays DATETIME values in 'YYYY-MM-DD HH:MM:SS' format |
| TIMESTAMP | A timestamp | The range is '1970-01-01 00:00:00' to sometime in the year 2037. MySQL displays TIMESTAMP values in YYYYMMDDHHMMSS, YYMMDDHHMMSS, YYYYMMDD or YYMMDD format, depending on whether M is 14 (or missing), 12, 8 or 6, but allows you to assign values to TIMESTAMP columns using either strings or numbers. A TIMESTAMP column is useful for recording the date and time of an INSERT or UPDATE operation because it is automatically set to the date and time of the most recent operation if you don't give it a value yourself |
| TIME | A time | The range is '-838:59:59' to '838:59:59'. MySQL displays TIME values in 'HH:MM:SS' format, but allows you to assign values to TIME columns using either strings or numbers |

| | | |
|-------------------------------|---|---|
| YEAR | A year in 2- or 4- digit formats (default is 4-digit) | The allowable values are 1901 to 2155, and 0000 in the 4 year format and 1970-2069 if you use the 2 digit format (70-69). MySQL displays YEAR values in YYYY format, but allows you to assign values to YEAR columns using either strings or numbers. (The YEAR type is new in MySQL 3.22.) |
| CHAR | A fixed-length string that is always right-padded with spaces to the specified length when stored | The range of Length is 1 to 255 characters. Trailing spaces are removed when the value is retrieved. CHAR values are sorted and compared in case-insensitive fashion according to the default character set unless the BINARY keyword is given |
| VARCHAR | A variable-length string. Note: Trailing spaces are removed when the value is stored (this differs from the ANSI SQL specification) | The range of Length is 1 to 255 characters. VARCHAR values are sorted and compared in case-insensitive fashion unless the BINARY keyword is given |
| TINYBLOB, TINY-TEXT | | A BLOB or TEXT column with a maximum length of 255 ($2^8 - 1$) characters |
| BLOB, TEXT | | A BLOB or TEXT column with a maximum length of 65535 ($2^{16} - 1$) characters |
| MEDIUMBLOB, MEDIUMTEXT | | A BLOB or TEXT column with a maximum length of 16777215 ($2^{24} - 1$) characters |
| LONGBLOB, LONGTEXT | | A BLOB or TEXT column with a maximum length of 4294967295 ($2^{32} - 1$) characters |
| ENUM | An enumeration | A string object that can have only one value, chosen from the list of values 'value1', 'value2', ..., or NULL. An ENUM can have a maximum of 65535 distinct values. |
| SET | A set | A string object that can have zero or more values, each of which must be chosen from the list of values 'value1', 'value2', ... A SET can have a maximum of 64 members |

Appendix-4 Earthquake information

Earthquake Classification

There are 7 types of earthquake for WOVOdat (sd_evn_eqtype):

1. VT : volcano-tectonics
2. H : hybrid
3. LF : low frequency
4. VLF : very-low frequency
5. E : eruption quake
6. V : generic volcanic quake without any further classification
7. R : regional tectonic earthquake
8. Q : query blasts
9. U : unknown origin
10. O : Other, non-volcanic origin
11. X : Undefined

Description of the 8 types of earthquake classifications occurring in and at surrounding volcanoes:

1. VT-type

VT-type is used for volcanic earthquake that results from faulting failure mechanism. It is similar to regional seismic event except that it happens inside or underneath volcanic body. Many observatories might use different terminology, such as high-frequency event (HF). In the former time A-Type of Minakami's classification is more widely used. As this type of event is generated by faulting process, when the source-receiver distance is quite far (more than 2 km from Minakami's term), P and S phases could be clearly distinguished in seismogram. With a modern instrument, digital seismic record could identify VT-type that might be at a closer distance. Thus it is possible to identify VT-type of closer source. Faulting process generates a high frequency signal of more than 5 Hz. Thus, a term of "HF- event" is usually used in place of VT-type.

2. H-type

H-type is used to name Hybrid seismic event. It is an events containing a combination of high and low frequency. B-Type from Minakami is based on that there is no clear S arrival, which could be similar to shallow VT (shallow VT). However it could be also related to a dome growth. Event-accompanying dome growth is in a form of Hybrid (St. Helens) (= or MP (Merapi)). Hybrid events usually consist of HF part (first onset) and LF part (coda) (Redoubt, Monserrat), whereas LHF is another hybrid with inverse order (LF first then HF).

3. LF-type

Low frequency event is related to the volcanic process inside volcano. Fluid and gas play role in creating such an event. Its frequency is about 0.5-5 Hz. There is no indication of P-S distinction because it is not from faulting mechanism.

4. VLP

Installation of broadband seismograph in many volcanoes could have revealed the presence of VLP events. Its signal period ranges from 2 to 30 second. (in Hachijo island T=20s; Erebus T=8-20s; Stromboli T=2-30s). Some recent studies conclude that VLP is related to a movement of a gas slug inside volcano conduit. (O'Brien and Bean, GRL 35, 2008)

5. E (for Explosion)

Explosion event is seismic signal that accompany eruption process.

6. T (for Tremor)

Tremor is a continuous seismic signal with a duration from several minutes to days. Many volcanoes produce tremor with only single dominant frequency (monochromatic tremor), or tremor with two or harmonic peaks (harmonic tremor). Some tremors, from record observation have wider frequency content (non-harmonic tremor).

Earthquake swarm with dense event population, commonly happen prior to eruption, (=short interval between events) could produce non-harmonic tremor, or a “dense- events” tremor

7. R

R-type, or regional type uses for tectonic earthquakes occurring close to the volcano. For individual volcanic cone, the term “close” refers to distance of less than 30 km (?) from the volcano edifice. For a volcanic zone, such as Campi Flegrei and Auckland volcanic zones, it refers to distance of 30 km (?) from the outer boundary of the zone. Storing data about tectonic earthquakes near volcano in the WOVOdat is important as in several cases that volcanic activity could be affected or re-awakened by tectonic earthquakes.

8. Q-type

Quarry blast occurring on volcanic region

R and Q is non-volcanic earthquake, however it may have a relation to volcanic activity or occurred in volcanic area. V is used when the type is not specified.

To store more detail classification, earthquake subtypes are added.

| Earthquake general classification | Type of earthquake | Subtype of earthquake |
|-----------------------------------|--------------------------------|--|
| Regional Tectonic | Regional Tectonic (R) | |
| Query blast | Query blast (Q) | |
| Volcanic | General volcanic (V) | |
| | Volcano tectonic (VT) | General or non specified (VT) Deep (VT_D) Shallow (VT_S) |
| | Hybrid (H) | General or non specified (H) High- then follow by low frequency (H_HLF) Low- then follow by high frequency (H_LHF) |
| | Low frequency (LF) | Long period (LF_LP) Tornillo 0.7-8Hz 0.5-5min (LF_T) Intermediate low frequency (LF_ILF) |
| | Very long period (VLP) | |
| | Explosion (E) | |
| | Unknown origin (U) | |
| | Other, non volcanic origin (O) | |
| | Undefined (X) | |

sd_evn_eqtype => 'R','Q','V','VT','VT_D','VT_S','H','H_HLF','H_LHF','LF','LF_LP','LF_T','LF_ILF','VLP','E','U','O','X'

| Earthquake general classification | Type of tremor | Subtype of tremor |
|-----------------------------------|----------------|--|
| Volcanic | Tremor (T) | General or non specified (T) Harmonic (H) Monochromatic (M) Close-events tremor (C) |

sd_trm_type => 'T','H','M','C'

Magnitude Types

The identifying factor for the magnitudes is the magnitude type, sd_evn_pmag_type and sd_evn_smag_type. The magnitude types are limited to the following:

- **duration (Md)**

The duration magnitude is based on the duration of shaking as measured by the time decay of the amplitude of the seismogram. This magnitude (also known as coda magnitude) is often used to compute magnitude from seismograms with "clipped" waveforms due to limited dynamic recording range of analog instrumentation.

- **local (ML)**

The local magnitude (ML) is the original magnitude relationship defined by Richter and Gutenberg for local earthquakes and is based on the maximum amplitude of a seismogram recorded on a Wood-Anderson torsion seismograph (appropriate adjustments are made for modern instrumentation).

- **surface wave (Ms)**

The surface wave magnitude (Ms) is used for distant earthquakes based on the amplitude of Rayleigh surface waves measured at a period near 20 sec.

- **moment (Mw)**

The moment magnitude (Mw) is based on the moment of the earthquake, which is equal to the rigidity of the earth times the average amount of slip on the fault times the amount of fault area that slipped.

- **body (Mb)**

The body magnitude (Mb) is based on the amplitude of P body-waves and is most appropriate for deep-focus earthquakes.

Appendix-5 Submit Data

Submit data: conversion and upload (version: July 2013)

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;
- [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):

Volcano:

Type of Data to convert:

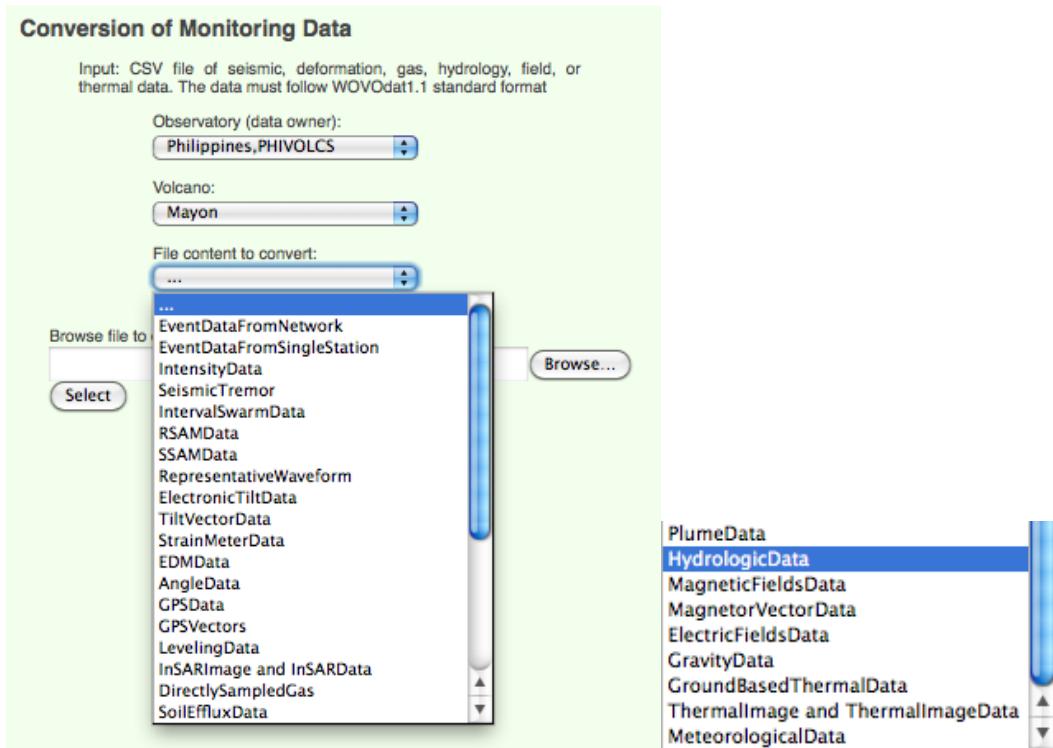
...

...

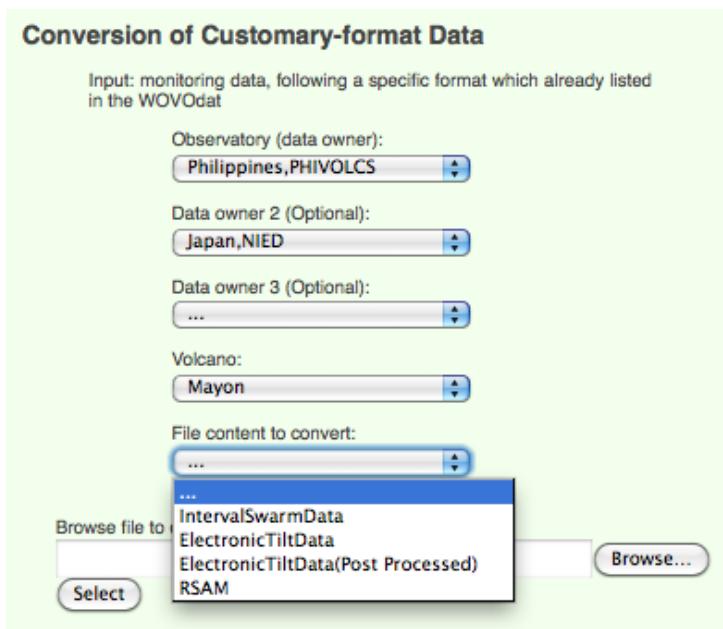
SeismicNetwork
SeismicStation
SeismicInstrument
SeismicComponent
DeformationNetwork
DeformationStation
DeformationInstrument_General
DeformationInstrument_Tilt/Strain
GasNetwork
GasStation
GasInstrument
HydrologicNetwork
HydrologicStation
HydrologicInstrument
ThermalNetwork
ThermalStation
ThermalInstrument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

FieldsInstrument
MeteorologicalNetwork
MeteorologicalStation
MeteorologicalInstrument
Airplane
Satellite

(b) Monitoring data



(c) Customary format data



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 Proce

Station:
KWBT

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

Browse Radial

Browse Tangential or 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*)

Observatory (data owner):
Philippines,PHIVOLCS

Volcano:
Parker

Type of Data to convert:
SeismicComponent

Network:
Parker Seismic Network

Station:
Parker_west

Instrument:
Guralp CMG-40T

Browse file to convert:
/Users/eoschristina/Desktop/PHIVOLCS_2012/Submit_data

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:

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.



Data stored in the database.

Showing rows 1020 - 1022 (1,023 total). Query took 0.0009 sec.

SELECT *
FROM `si`
LIMIT 1020, 30

Page number: 35

Show: 30 row(s) starting from row # 0 in horizontal mode and repeat headers after 100 cells

Sort by key: None

+ Options

| si_id | si_code | ss_id | si_name | si_type | si_range | si_gain | si_filter | si_ncomp | si_resp | si_resp_file | si_stime | si_etime | si_stime_unc | si_etime_unc | si_com | cc_id | cc_id2 | cc_id3 | si_loaddate | si_pubdate | px_id | px_ids |
|-------|----------|-------|----------------|---------|-----------------|----------|---------------------|----------|-------------------------------------|--------------|---------------------|----------|---------------------|--------------|----------|-------|--------|--------|---------------------|---------------------|-------|--------|
| 1569 | VPMGW_BB | 3308 | Gurupi CMG-4CT | NULL | nominal 13dB | 5.80e+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 | 2012-02-01 07:54:46 | 2010-10-10 04:00:00 | 199 | NULL |
| 1570 | VPRST_SP | 3308 | L4-3816 | NULL | NULL | 6.82e+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 |
| 1571 | VPHSE_SP | 3307 | L4-3816 | NULL | NULL | 6.82e+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 |

Check All / Uncheck All With selected: Change Delete Export

Page number: 15

Show: 30 row(s) starting from row # 0 in horizontal mode and repeat headers after 100 cells

Query results operations

Print view Print view (with full texts) Export Display chart Create view

Submiting 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:

*Publication year (YYYY):

 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:

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⇒ 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: | <input type="text"/> Select Volcano |
| Inference time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Inference time uncertainty: | <input type="text"/> |
| *Start Time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Start Time Uncertainty: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| End Time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| End Time Uncertainty: | <input type="text"/> 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: | <input type="text"/> Select Observer. |
| Second Institution/Observatory: | <input type="text"/> Select Institution/Obs. |
| Third Institution/Observatory: | <input type="text"/> Select Institution/Obs. |
| Publish Date: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Bibliographic: (Hold down the Ctrl to select multiple options) | |
| <input type="text"/> Select bibliographic BGVN (2002) Bruno, N., Caltabiano, T., Grasso, M.F., Porto, M., Romano, R. (1994) SO ₂ flux frc Bruno, N., Caltabiano, T., Romano, R. (1999) SO ₂ emissions at Mt . Etna with pa | |

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⇒ Magma movement

Upload form for Magma Movement Information. Table : ip_mag

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

| | |
|---|---|
| *Unique Code: | <input type="text"/> |
| *Volcano Name: | <input type="text"/> Select Volcano |
| Inference time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Inference time uncertainty: | <input type="text"/> |
| *Start Time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Start Time Uncertainty: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| End Time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| End Time Uncertainty: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| *Supply of magma from depth: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Magma ascent, up from reservoir : | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Magma convection induced from below by an intrusion at the base: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Magma convection induced from above, by settling of a dense crystal-rich mass: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Magma mixing: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Dike intrusion: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Intrusion through a pipe-like cylindrical conduit: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Sill intrusion: | <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: | <input type="text"/> Select Observer. |
| Second Institution/Observatory: | <input type="text"/> Select Institution/Obs. |
| Third Institution/Observatory: | <input type="text"/> Select Institution/Obs. |
| Publish Date: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Bibliographic: (Hold down the Ctrl to select multiple options) | |
| <input type="text"/> Select bibliographic BGVN (2002) Bruno, N., Caltabiano, T., Grasso, M.F., Porto, M., Romano, R. (1994) SO ₂ flux frc Bruno, N., Caltabiano, T., Romano, R. (1999) SO ₂ emissions at Mt . Etna with pa | |

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⇒ Buildup of magma pressure

Upload form for Buildup of magma pressure Information. Table : ip_pres

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

| | |
|--|---|
| *Unique Code: | <input type="text"/> |
| *Volcano Name: | <input type="text"/> Select Volcano |
| Inference time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Inference time uncertainty: | <input type="text"/> |
| *Start Time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Start Time Uncertainty: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| End Time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| End Time Uncertainty: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| *Gas-induced overpressure: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Tectonic overpressure: | <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: | <input type="text"/> Select Observer. |
| Second Institution/Observatory: | <input type="text"/> Select Institution/Obs. |
| Third Institution/Observatory: | <input type="text"/> Select Institution/Obs. |
| Publish Date: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Bibliographic: (Hold down the Ctrl to select multiple options) | <input type="text"/> Select bibliographic BGVN (2002) Bruno, N., Caltabiano, T., Grasso, M.F., Porto, M., Romano, R. (1994) SO ₂ flux fro Bruno, N., Caltabiano, T., Romano, R. (1999) SO ₂ emissions at Mt . Etna with pa |

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⇒ Volatile saturation

Upload form for Volatile saturation Information. Table : ip_sat

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

| | |
|---|---|
| *Unique Code: | <input type="text"/> |
| *Volcano Name: | <input type="text"/> Select Volcano |
| Inference time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Inference time uncertainty: | <input type="text"/> |
| *Start Time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Start Time Uncertainty: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| End Time: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| End Time Uncertainty: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| *Magma became saturated with CO ₂ before an eruption and contributed to preeruption unrest: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Magma became saturated with H ₂ O before an eruption and contributed to preeruption unrest: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Volatile saturation by decompression : | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Volatile saturation by change in fO ₂ : | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Volatile addition: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Volatile saturation by crystallization or second boiling : | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Subsurface, preeruptive increases in vesiculation, thereby decreasing density: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Subsurface, preeruptive decreases in vesiculation, thereby increasing density: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Deep and near-surface degassing including gas explosion events : | <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: | <input type="text"/> Select Observer. |
| Second Institution/Observatory: | <input type="text"/> Select Institution/Obs. |
| Third Institution/Observatory: | <input type="text"/> Select Institution/Obs. |
| Publish Date: | <input type="text"/> YYYY-MM-DD HH:MM:SS |
| Bibliographic: (Hold down the Ctrl to select multiple options) | <input type="text"/> Select bibliographic BGVN (2002) Bruno, N., Caltabiano, T., Grasso, M.F., Porto, M., Romano, R. (1994) SO ₂ flux fro Bruno, N., Caltabiano, T., Romano, R. (1999) SO ₂ emissions at Mt . Etna with pa |

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⇒ Regional tectonics interaction

Upload form for Regional tectonics interaction Information. Table : ip_tec

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

| | |
|--|---|
| *Unique Code: | <input type="text"/> |
| *Volcano Name: | <input type="text"/> |
| Inference time: | <input type="text"/> |
| Inference time uncertainty: | <input type="text"/> |
| *Start Time: | <input type="text"/> |
| Start Time Uncertainty: | <input type="text"/> |
| End Time: | <input type="text"/> |
| End Time Uncertainty: | <input type="text"/> |
| *Tectonically induced changes in magma/hydrothermal system: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Changes induced by changes in static stress after large regional earthquakes: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Changes induced by dynamic strain, associated with passage of earthquake waves from distal sources : | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Changes induced by local fault shear or other deformation of the cone: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Changes induced by slow earthquake, as recorded in a GPS or other strain network : | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Changes induced by pressurization of magma or hydrothermal reservoir located several kilometers or more from the apparent center of unrest: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Changes induced by depressurization of magma or hydrothermal reservoir located several kilometers or more from the apparent center of unrest: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Changes induced by increased hydrothermal pore pressures ("lubrication") along faults beneath or near the volcano : | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Earth tide interaction with magma/hydrothermal systems: | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe <input checked="" type="radio"/> Unknown |
| *Interaction of the volcanic system with changes in atmospheric pressure, rainfall, wind, etc.: | <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: | <input type="text"/> |
| Second Institution/Observatory: | <input type="text"/> |
| Third Institution/Observatory: | <input type="text"/> |
| Publish Date: | <input type="text"/> |

Bibliographic: (Hold down the Ctrl to select multiple options)

Select bibliographic
 BCVN (2002)
 Bruno, N., Caltrabiano, T., Grasso, M.F., Porto, M., Romano, R. (1994) SO₂ flux fro
 Bruno, N., Caltrabiano, T., Romano, R. (1999) SO₂ emissions at Mt . Etna with par

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⇒ Volcano

Upload form for Volcano Data. Table : vd

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

| | |
|---------------------------------|----------------------|
| *Volcano CAVW: | <input type="text"/> |
| *Volcano Name: | <input type="text"/> |
| Volcano Second Name: | <input type="text"/> |
| Volcano Time Zone: | <input type="text"/> |
| vd_mcont: | <input type="text"/> |
| Comment: | <input type="text"/> |
| *Institution/Observatory: | <input type="text"/> |
| Second Institution/Observatory: | <input type="text"/> |
| Third Institution/Observatory: | <input type="text"/> |
| Fourth Institution/Observatory: | <input type="text"/> |
| Fifth Institution/Observatory: | <input type="text"/> |
| Publish Date: | <input type="text"/> |

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⇒ Volcano Information

Upload form for Volcano Information. Table : vd_inf

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

| | |
|--------------------------------|-------------------------|
| *Volcano Name: | Select Volcano |
| *Volcano Info CAVW: | <input type="text"/> |
| *Volcano Status: | Select Volcano Status |
| Description: | <input type="text"/> |
| *Summit Latitude: | <input type="text"/> |
| *Summit Longitude: | <input type="text"/> |
| *Summit Elevation: | <input type="text"/> |
| *Volcano Type: | Select Volcano Type |
| Geographic Location: | <input type="text"/> |
| *Dominant Rock Type: | Select Rock Type |
| Volume Of Edifice: | <input type="text"/> |
| Number Of Calderas: | <input type="text"/> |
| Diameter Of Largest Caldera: | <input type="text"/> |
| Latitude Of Youngest Caldera: | <input type="text"/> |
| Longitude Of Youngest Caldera: | <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 |
| Comment: | <input type="text"/> |
| *Institution/Observatory: | Select Institution/Obs. |
| Publish Date: | YYYY-MM-DD HH:MM::SS |

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⇒ Magma Chamber

Upload form for Volcano Magma Chamber Information. Table : vd_mag

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

| | |
|--|-------------------------|
| *Volcano Name: | Select Volcano |
| Diameter of low velocity zone: | <input type="text"/> |
| Volume of low velocity zone: | <input type="text"/> |
| Depth to top of low velocity zone: | <input type="text"/> |
| Volume of largest eruption: | <input type="text"/> |
| Dominant rock type: | <input type="text"/> |
| Outlier rock type: | <input type="text"/> |
| Second outlier rock type: | <input type="text"/> |
| Third outlier rock type: | <input type="text"/> |
| Minimum SiO ₂ content of whole rocks erupted: | <input type="text"/> |
| Maximum SiO ₂ content of whole rocks erupted: | <input type="text"/> |
| Comment: | <input type="text"/> |
| *Institution/Observatory: | Select Institution/Obs. |
| Publish Date: | YYYY-MM-DD HH:MM:SS |

Bibliographic: (Hold down the Ctrl to select multiple options)

Select bibliographic
BGVN (2002)
Bruno, N., Caltabiano, T., Grasso, M.F., Porto, M., Romano, R. (1994) SO₂ flux fro
Bruno, N., Caltabiano, T., Romano, R. (1999) SO₂ emissions at Mt. Etna with pa

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⇒ Tectonic Settings

Upload form for Volcano Tectonic setting Information. Table : vd_tec

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

| | |
|-----------------------------|-------------------------|
| *Volcano Name: | Select Volcano |
| Description: | <input type="text"/> |
| Rate of strike-slip: | <input type="text"/> |
| Rate of extension: | <input type="text"/> |
| Rate of convergence: | <input type="text"/> |
| Travel rate across hotspot: | <input type="text"/> |
| Comment: | <input type="text"/> |
| *Institution/Observatory: | Select Institution/Obs. |
| Publish Date: | YYYY-MM-DD HH:MM:SS |

Bibliographic: (Hold down the Ctrl key to select multiple options)

Select bibliographic
BGVN (2002)
Bruno, N., Caltabiano, T., Grasso, M.F., Porto, M., Romano, R. (1994) SO₂ flux fro ▲
Bruno, N., Caltabiano, T., Romano, R. (1999) SO₂ emissions at Mt . Etna with pa ▼

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⇒ Observation about volcanic activity

Upload form for Volcano Activity Information. Table : co

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

| | |
|---------------------------------|-------------------------|
| *Unique Code: | <input type="text"/> |
| *Volcano Name: | Select Volcano |
| Description: | <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 |
| Comment: | <input type="text"/> |
| *Observer: | 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
BGVN (2002)
Bruno, N., Caltabiano, T., Grasso, M.F., Porto, M., Romano, R. (1994) SO₂ flux fro ▲
Bruno, N., Caltabiano, T., Romano, R. (1999) SO₂ emissions at Mt . Etna with pa ▼

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⇒ Observatory contact

Upload form for Observatory Contact Information. Table : cc

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

| | |
|------------------------|----------------------|
| *Observatory Code: | <input type="text"/> |
| Observatory Code 2: | <input type="text"/> |
| *Observatory Name: | <input type="text"/> |
| *observatory Address: | <input type="text"/> |
| observatory Address 2: | <input type="text"/> |
| *City: | <input type="text"/> |
| *State: | <input type="text"/> |
| *Country: | <input type="text"/> |
| *Postal code: | <input type="text"/> |
| *Web address (URL): | <input type="text"/> |
| *Email: | <input type="text"/> |
| *Contact Number: | <input type="text"/> |
| Contact Number 2: | <input type="text"/> |
| Fax: | <input type="text"/> |
| Comments: | <input type="text"/> |

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Appendix-6 WOVOdat standalone package

Installing WOVOdat Structure on own system (version: July 2013)

WOVOdat scripts are also available for countries those willing to start developing their own database for managing volcano monitoring data. This also to familiarize users/observatories with the WOVOdat data formats.

We provide a ready installable MySQL database template (WOVOdat database), which follow schematic structure and format of WOVOdat, designated for each individual volcano observatory.

An interactive tool for user to submit data is also provided ([WOVOdat tool](#)). The data will be converted from common WOVOdat CSV format into WOVOdat XML common formats (WOVOml), uploaded and store in the database system.

Detail information about installation is explained in the [README](#) file.

Package downloadable through:

http://www.wovodat.org/installing/download_installable.php

The screenshot shows the WOVOdat homepage with a red header. The header includes the WOVOdat logo, the text "WOVOdat A Database of Volcanic Unrest", and logos for the Earth Observatory of Singapore and the Smithsonian National Museum of Natural History. Below the header is a navigation bar with links: Home, Documentation, Volcano, SubmitData, Contact, and Partners. On the right side of the header, there are user login details: "cwidiwijayan..." and "Logout". The main content area has a green background. It features a heading "Installing WOVOdat Structure on own system" followed by descriptive text about the availability of WOVOdat scripts for developing local databases. It also mentions the WOVOdat tool for data submission and conversion. At the bottom of this section, it says "Detail information about installation is explained in the [README](#) file." To the right, there is a light green sidebar titled "Downloadable Packages" with a list of items:

- WOVOdat database template:
Please select observatory before downloading the database.
Select Observatory:
- Download WOVOdat Database: [WOVODAT Database package](#)
- Download WOVOdat UI Tool: [WOVOdat tool](#).

Setting Up The Computer for WOVOdat

And Installing WOVOdat database (*last updated: October 16, 2012*)

Getting Started

The WOVOdat is a Linux base SQL of volcanic unrest database. In this tutorial we will describe an example on how to install WOVOdat database into a localhost on an Ubuntu base system.

Note: To be able to install WOVOdat packages, the user should be sys-admin or have sys-admin privileges.

Prerequisite:

Computer running Ubuntu operating system. The latest Ubuntu can be obtained from <http://www.ubuntu.com>.

The following packages are required:

- Apache2
- Mysql
- Php5
- Php-pear
- Php-db
- Phpmyadmin – The GUI tool to handle the administration of mysql
- GMT

The following packages are optional:

- Openssh-server
- Filezilla --GUI tool to transfer file(s) between computers
- Image Magick

The above packages can be downloaded and installed from the Ubuntu online repository using the Ubuntu apt-get tool or Synaptic Package Manager.

Installation

- **Install Apache2**

```
% sudo apt-get install apache2  
% echo "ServerName localhost" | sudo tee  
/etc/apache2/conf.d/fqdn
```

Check the Apache2 installation

- Using web browser go to the URL <http://localhost>, if you see “It works!”, this proves that the Apache works.

- **Install php5**

```
% sudo apt-get install php5  
% sudo apt-get install libapache2-mod-php5  
  
% echo "<?php phpinfo(); ?>" | sudo tee  
/var/www/test.php
```

Check the PHP 5 installation

- Restart apache2:
[% sudo /etc/init.d/apache2 restart]
- Go to the URL <http://localhost/test.php>, if you can see the description of PHP5 configuration, it proves that PHP5 installation is successful.

- **Install mysql**

```
% sudo apt-get install mysql-server mysql-client mysql-common
```

Check the mysql installation

- From the terminal:
[% mysql -u root -p]

If it prompts you for the password to login, it means that MySQL is successfully installed.

- **Install phpmyadmin**

```
% sudo apt-get install phpmyadmin  
% sudo /etc/init.d/apache2 restart
```

Check the phpmyadmin installation

- Go to the URL <http://localhost/phpmyadmin>, if you can see the phpmyadmin login page, it proves that the phpmyadmin works fine. The user will need to provide the root login of mysql to log into phpmyadmin. Once logged in, the user can create the phpmyadmin user account(s).
(Note: path will be different if you are installing on virtual machine)

If you do not see the phpmyadmin login page, do the following steps and go to the URL <http://localhost/phpmyadmin> again.

```
%sudo ln -s /etc/phpmyadmin/apache.conf  
/etc/apache2/conf.d/phpmyadmin.conf  
  
% sudo /etc/init.d/apache2 restart
```

- **Install php-pear**

```
% sudo apt-get install php-pear
```

- **Install php-db**

```
% sudo apt-get install php-db
```

- **Install openssh-server**

```
% sudo apt-get install openssh-server
```

- **Install filezilla**

```
% sudo apt-get install filezilla
```

- **Install netCDF**

- Download netCDF from
http://www.unidata.ucar.edu/downloads/netcdf/netcdf-4_1_3/index.jsp
- Uncompress the downloaded file at /home/usrName directory. The **/home/usrName/netcdf-4.1.3** will be created after uncompressing the netcdf-4.1.3.tar.gz.

```
% tar -zvxf netcdf-4.1.3.tar.gz
```

- Compile and install netCDF. By default, netCDF is installed in /usr/local and it is recommended.

```
% cd /home/username/netcdf-4.1.3  
% sudo apt-get install make  
% sudo ./configure --enable-netcdf-4  
% sudo make check install
```

- **Install GMT**

- Go to the link <http://gmt.soest.hawaii.edu/> and click on the “Download” link that is on left side menu. After that, click on “INSTALL_FORM” is in the middle of the page. Find the “install_gmt.sh” file and download it to your favor directory.
- Go into that the directory where GMT is downloaded. Execute the following command and accept the given default option.

```
% chmod 755 ./install_gmt.sh  
% sudo ./install_gmt.sh
```

Note:

- **DO NOT** install netCDF through install_gmt.sh because the netCDF installed by install_gmt.sh is pretty old version and we have already installed the netCDF-4.1.3 which is the newer version.
- The **install_gmt.sh** must be executed as super user. In order for the GMT works with WOVOdat, the GMT tool should be installed in **/usr/lib/gmt/bin**

- **Refer to the sample installation below**

```
% sudo ./install_gmt.sh  
=====>>> Interactive installation of GMT <<<<<  
  
We first need a questions and answer session to determine how and where GMT is to be installed. Then, when all parameters have been assembled, we will run the installation (unless you chose -n when starting this script).  
  
This script will install the latest version of GMT 4.5.8.  
  
==> Enter make utility to use [make]: make  
  
If you are behind a firewall you will need to use a passive ftp session. Only if you have some very old ftp client, you may have to resort to active ftp (which involves the server connecting back to the client).  
  
==> Do you want passive ftp transmission (y/n) [y]: y  
==> Have you installed netcdf (version 3.6 or later)? (y/n) [y]: y  
==> Enter directory with netcdf lib and include [/usr/local]: /usr/local  
  
GMT4 offers experimental and optional support for other grid formats and plotting of geotiffs via GDAL. To use this option you must already have the GDAL library and include files installed.  
  
==> Use experimental GDAL grid input in GMT4 (y/n) [y]: n  
==> Install GMT version 4.5.8? (y/n) [y]: y  
==> Install GSHHS version 2.2.0? (y/n) [y]: y  
==> Get the GMT version 4.5.8 archive (38 Mb) via ftp? (y/n) [y]: y  
==> Get the GSHHS version 2.2.0 archive (45 Mb) via ftp? (y/n) [y]: y
```

We offer 9 different ftp sites. Choose the one nearest you in order to minimize net traffic and transmission times. The sites are:

1. SOEST, U of Hawaii [GMT Home], Honolulu, Hawaii, USA
2. NOAA, Lab for Satellite Altimetry, Silver Spring, Maryland, USA
3. IRIS, Incorporated Research Institutions for Seismology, Seattle, Washington, USA
4. IAG-USP, Dept of Geophysics, U. of Sao Paulo, BRAZIL
5. Dept of Geosciences, U of Oslo, NORWAY
6. Goodie Domain Service, Vienna U of Techology, AUSTRIA
7. Tokai U, Shimizu, JAPAN
8. School of Geosciences, U of Sydney, AUSTRALIA
9. TENET, Tertiary Education & Research Networks of South Africa, SOUTH AFRICA

==> Enter your choice [1]: 7

You selected site number 7:

7. Tokai U, Shimizu, JAPAN

This anonymous ftp server ftp.scc.u-tokai.ac.jp only accepts connections from computers on the Internet that are registered in the Domain Name System (DNS). If you encounter a problem connecting because your computer is not registered, please either use a different computer that is registered or see your computer systems administrator (or your site DNS coordinator) to register your computer.

GMT can use two different algorithms for Delauney triangulation.

Shewchuk [1996]: Modern and very fast, copyrighted.

Watson [1982] : Older and slower, public domain.

Because of the copyright, GMT uses Watson's routine by default.
However, most will want to use the optional Shewchuk routine.

==> Use optional Shewchuk's triangulation routine (y/n)? [y]: y

The installation will install all GMT components in several subdirectories under one root directory. On most Unix systems this root directory will be something like /usr/local or /sw, under which the installation will add bin, lib, share, etc. Below you are asked to select the location of each of the subdirectories.

==> Directory for GMT4 executables? [/home/wovodat/GMT4.5.8/bin]:
/usr/lib/gmt/bin

==> Directory for GMT4 linkable libraries? [/usr/lib/gmt/lib]: **/usr/lib/gmt/lib**

==> Directory for GMT4 include files? [/usr/lib/gmt/include]:
/usr/lib/gmt/include

==> Directory for GMT4 data resources? [/usr/lib/gmt/share]:
/usr/lib/gmt/share

Unix man pages are usually stored in /usr/man/manX, where X is the relevant man section. Below, you will be asked for the /usr/man part; the /manX will be appended automatically, so do not answer /usr/man/man1.

==> Directory for GMT4 man pages? [/usr/lib/gmt/man]: **/usr/lib/gmt/man**

==> Directory for GMT4 doc pages? [/usr/lib/gmt/share/doc/gmt]:
/usr/lib/gmt/share/doc/gmt

At run-time GMT4 will look in the directory /usr/lib/gmt/share to find configuration and data files. That directory may appear with a different name to remote users if a different mount point or a symbolic link is set. GMT4 can use the environment variable \$GMT_SHAREDIR to point to the right place. If users see a different location for the shared data files, specify it here. (It will be used only to remind you at the end of the installation to set the environment variable \$GMT_SHAREDIR).

==> Enter value of GMT_SHAREDIR selection [/usr/lib/gmt/share]:
/usr/lib/gmt/share

The answer to the following question will modify the GMT4 defaults. (You can always change your mind by editing share/gmt.conf)

==> Do you prefer SI or US default values for GMT4 (s/u) [s]: s

The answer to the following question will modify the GMT4 defaults. (You can always change your mind later by using gmtset)

PostScript (PS) files may contain commands to set paper size, pick a specific paper tray, or ask for manual feed. Encapsulated PS files (EPS) are not intended for printers (but will print ok) and can be included in other documents. Both formats will preview on most viewers (out-of-date Sun pageview is an exception).

==> Do you prefer PS or EPS as default PostScript output (p/e) [p]: p

Building the GMT4 libraries as shared instead of static will reduce executable sizes considerably. GMT supports shared libraries under Linux, Mac OS X, SunOS, Solaris, IRIX, HPUX, and FreeBSD. Under other systems you may have to manually configure macros and determine what specific options to use with ld.

==> Try to make and use shared libraries? (y/n) [n]: n

If you have more than one C compiler you need to specify which, otherwise just hit return to use the default compiler.

==> Enter name of C compiler (include path if not in search path):

GMT4 can be built as 32-bit or 64-bit. We do not recommend to explicitly choose 32-bit or 64-bit, as the netCDF install is not set up to honor either of these settings. The default is to compile without sending any 32-bit or 64-bit options to the compiler, which generally create 32-bit versions on older systems, and 64-bit versions on newer systems, like OS X Snow Leopard.

==> Explicitly select 32- or 64-bit executables? (y/n) [n]: n
==> Produce universal executables (OS X)? (y/n) [n]: n

GMT4 passes information about previous GMT commands onto later GMT4 commands via a hidden file (.gmtcommands). To avoid that this file is updated by more than one program at the same time (e.g., when connecting two or more GMT4 programs with pipes) we

use POSIX advisory file locking on the file. Apparently, some versions of the Network File System (NFS) have not implemented file locking properly. We know this is the case with Linux pre-2.4 kernels when mounting NFS disks from a Unix server. If this is your case you should turn file locking OFF.

```
==> Use POSIX Advisory File Locking in GMT4 (y/n) [n]: n  
==> Want to test GMT4 by running the 30 examples? (y/n) [y]: y  
==> Delete all tar files after install? (y/n) [n]: n  
==> Enter name of the parameter file that will now be created  
[GMT4param.txt]: GMT4param.txt  
Session parameters written to file GMT4param.txt  
==> Hit return to start the install:
```

- After GMT installation, add the following entries into `/root/.bashrc` if the entries have not been set.

```
export  
PATH=/usr/lib/gmt/bin:/usr/lib/gmt/lib:/usr/lib/gmt/include:/usr/lib:$PATH  
export GMTHOME=/usr/lib/gmt  
export GMTPATH=/usr/lib/gmt/bin  
export MANPATH=/usr/lib/gmt/man:/usr/share/man:$MANPATH
```

Check GMT installation

- From the terminal:

```
% source .bashrc  
  
%man psxy
```

If GMT is successfully installed , it shows a manual page.

Install WOVOdat Tool

- Download [WOVODAT User Interface Tool](#) (wovodat_Tool.tar) from http://wovodat.org/installing/download_installable.php and save it under the directory: /home. This tar file includes:
 - Subdirectory-paths to organize and store script and data files.
 - PHP and HTML scripts for web-based user interface; include WOVOdat **Documentation**, **Visualization** and **Submit Data** with all scripts to convert WOVOdat CSV format into WOVOdat XML format, and upload WOVOdat XML to store the data into the database.

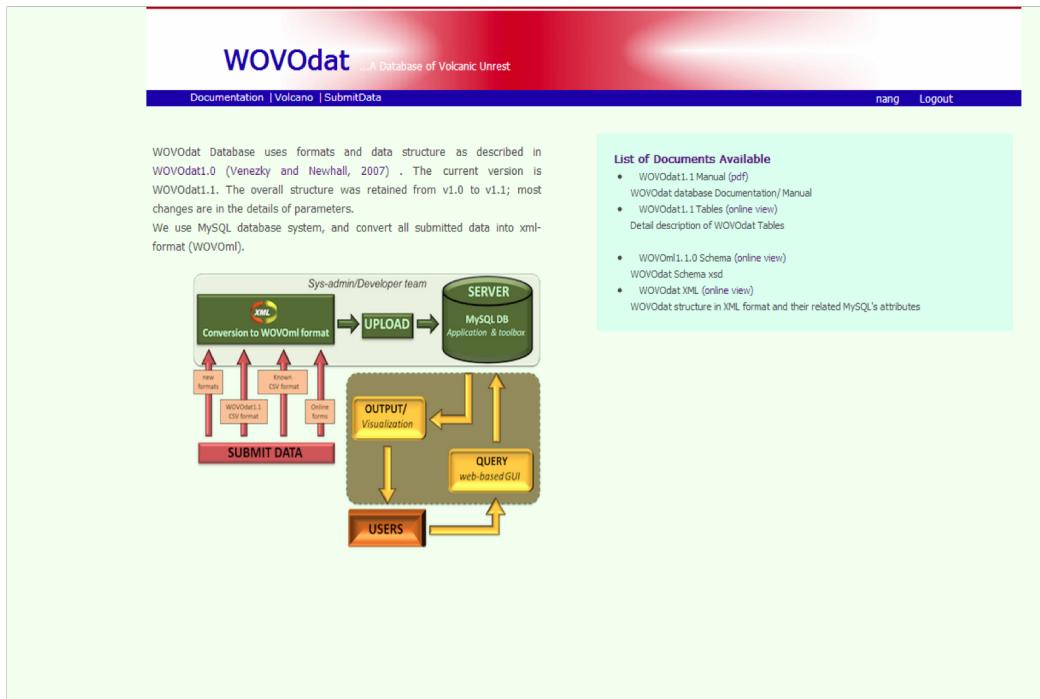


Figure 1. WOVOdat **Documentation** webpage

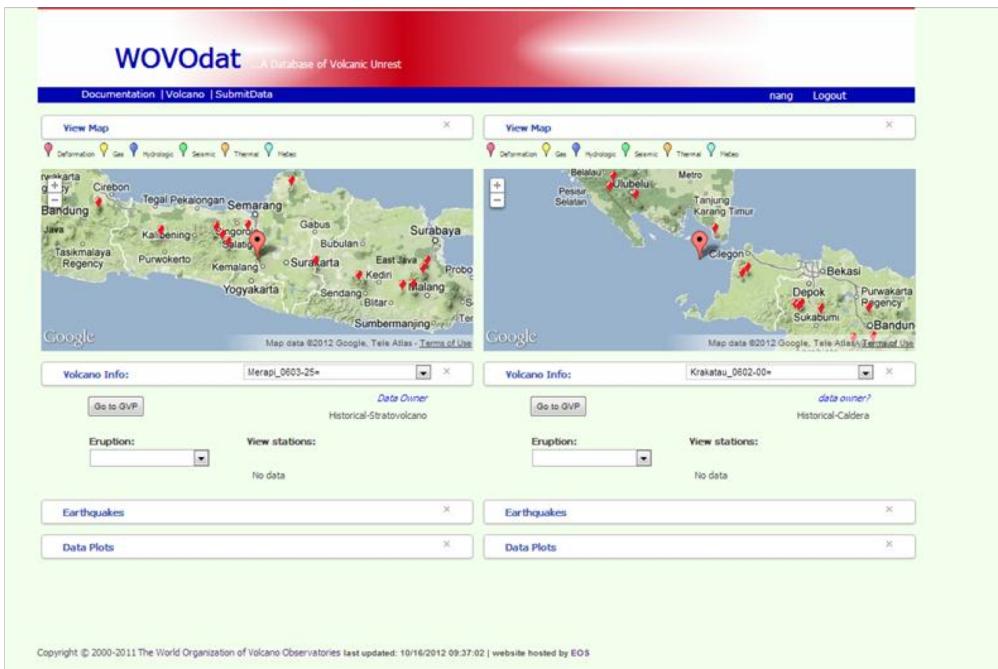


Figure 2. WOVOdat **Visualization** webpage

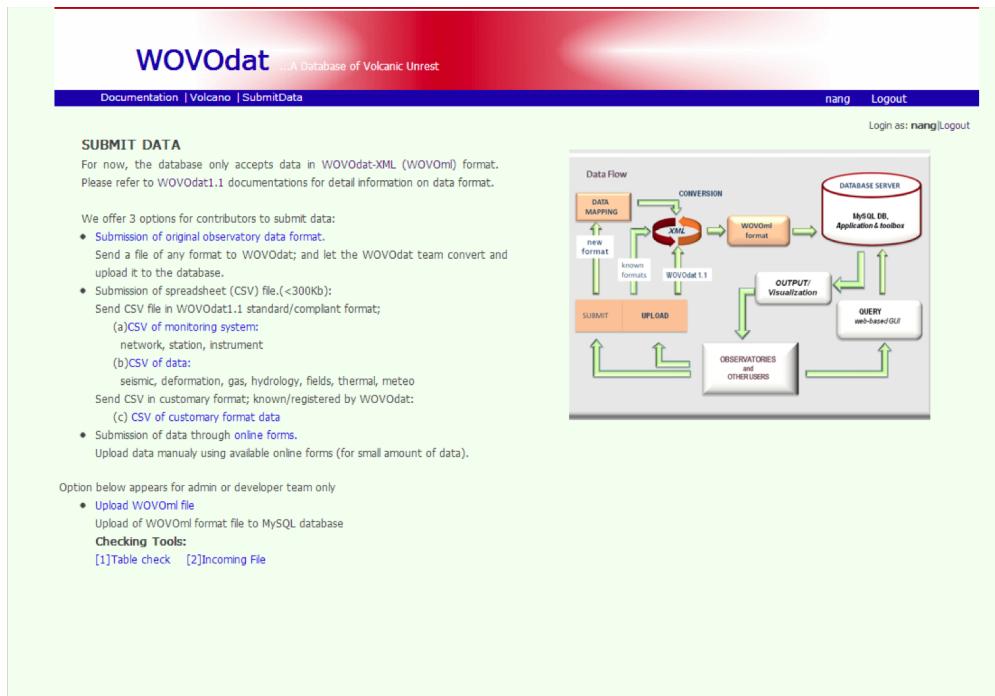


Figure 3. WOVOdat **Submit Data** webpage

- Uncompress the tar file under directory: /home. The whole package of scripts will therefore store under: /home/wovodat

Install WOVODat Database

- ① Download WOVODat database template (wovodat.sql) file from http://wovodat.org/installing/download_installable.php and save it into your favorite directory.
- ② Use web browser to go to this link <http://localhost/phpmyadmin> to import a database and create a new account.
- ③ Log in page will appear in the web browser, as shown in Figure 3. Type in MySQL username and password.
- ④ Press on ‘Go’ button to log in.

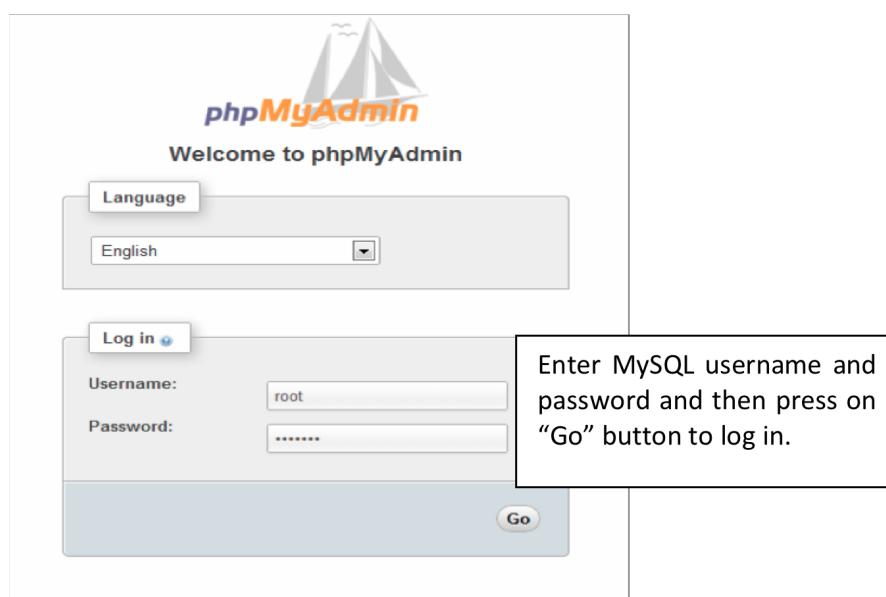


Figure 3. phpMyAdmin login page

Creating the new database and the new account using phpmyadmin

| | |
|------------------------|-------------------|
| Default Database Name: | wovodatdb Default |
| Username: | wovodatuser |
| Default Password: | wovodatpassword |

Note: if you want to change default database name, username and password, edit the following files:

- /home/wovodat/public_html/WOVOdat/PEAR/php/MYDB.php
- /home/wovodat/public_html/WOVOdat//PEAR/php/include/db_connect.php
- /home/wovodat/public_html/WOVOdat/PEAR/php/include/db_connect_view.php

How to import wovodat database (see Figure 4)

- ① Click on “Import” button that is at the top right frame to import “wovodat.sql” file.
- ② Click on “Browse” button to locate and choose “wovodat.sql” file from your computer and select ‘utf8’ for the character set.
- ③ Click on “Go” button to import it.
- ④ Now “wovodatdb” database has been installed on your system.

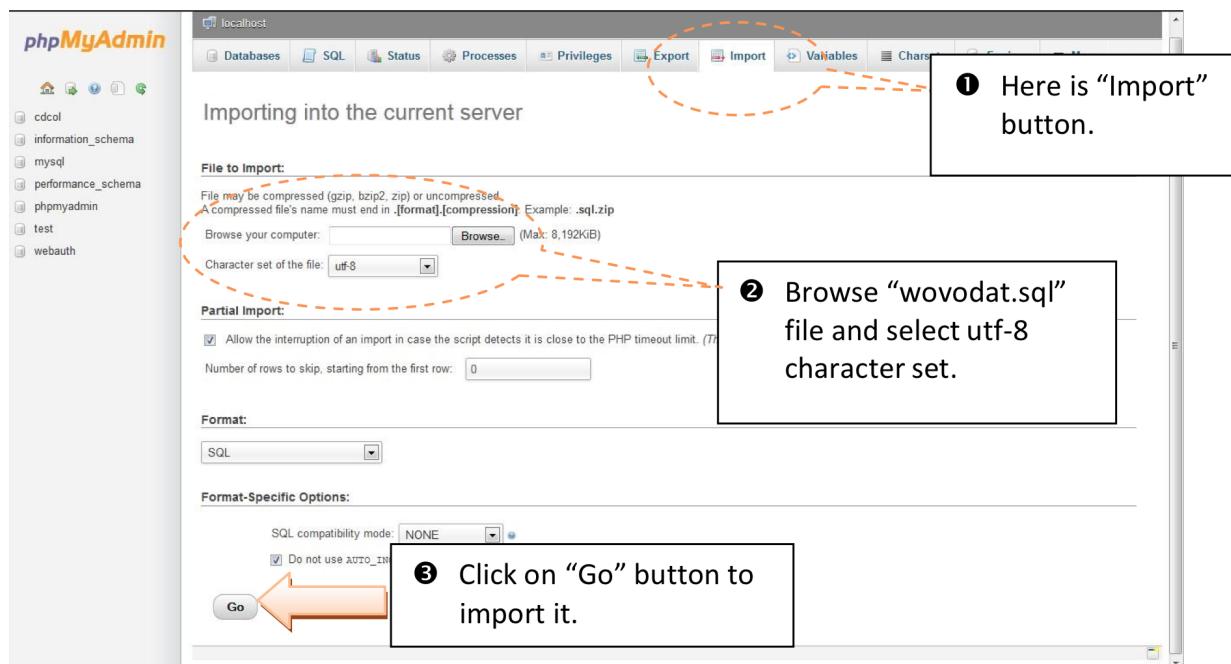


Figure 4. Importing a database into the current server using phpMyAdmin GUI

How to create a new account

Setting up new user account (see Figure 5)

- ① Click on Privileges menu that is at the left hand side panel.
- ② Click on “Add a new User” link near bottom left of Privileges page.

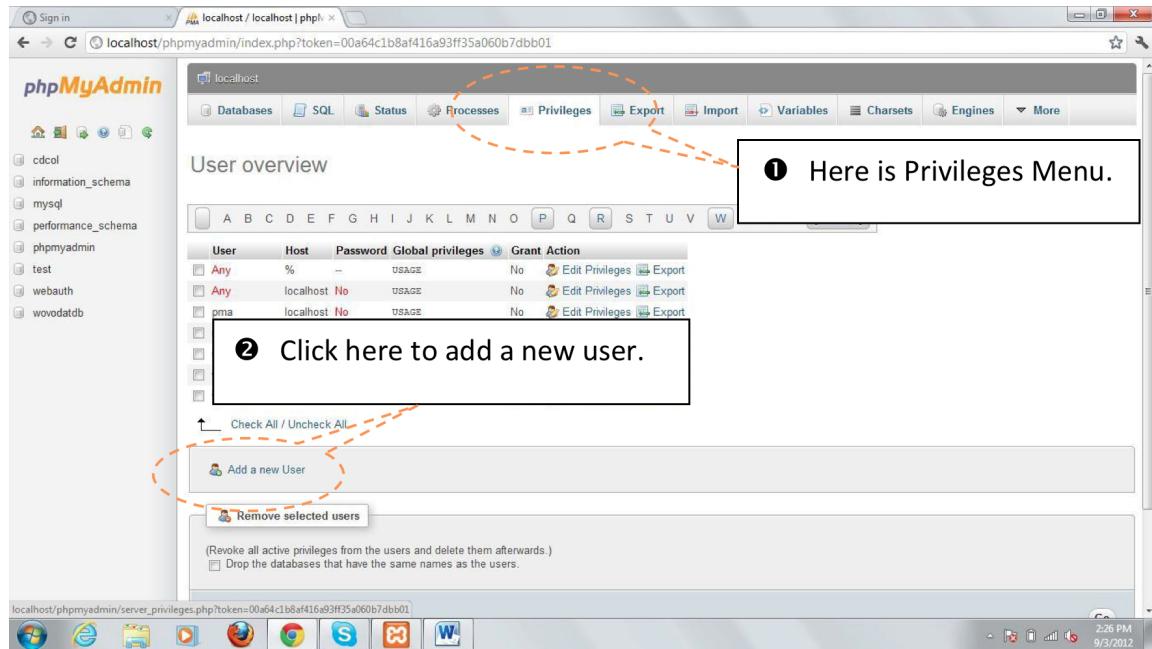


Figure 5. Create new account using phpMyAdmin GUI

Create login information and setting up privilege (see Figure 6)

- ③ Choose the field category from the left hand side drop down box and then move the cursor to the right hand side and type fill in the fields.
- ④ Click on ‘none’ radio button under “Database for user” section.
- ⑤ Click on “Check All” beside Global Privileges to give all permissions for the “wovodatuser”.
- ⑥ There is no change under “Resource Limits” section.
- ⑦ The last step is to click on “Create user” button to create the “wovodatuser” user account.

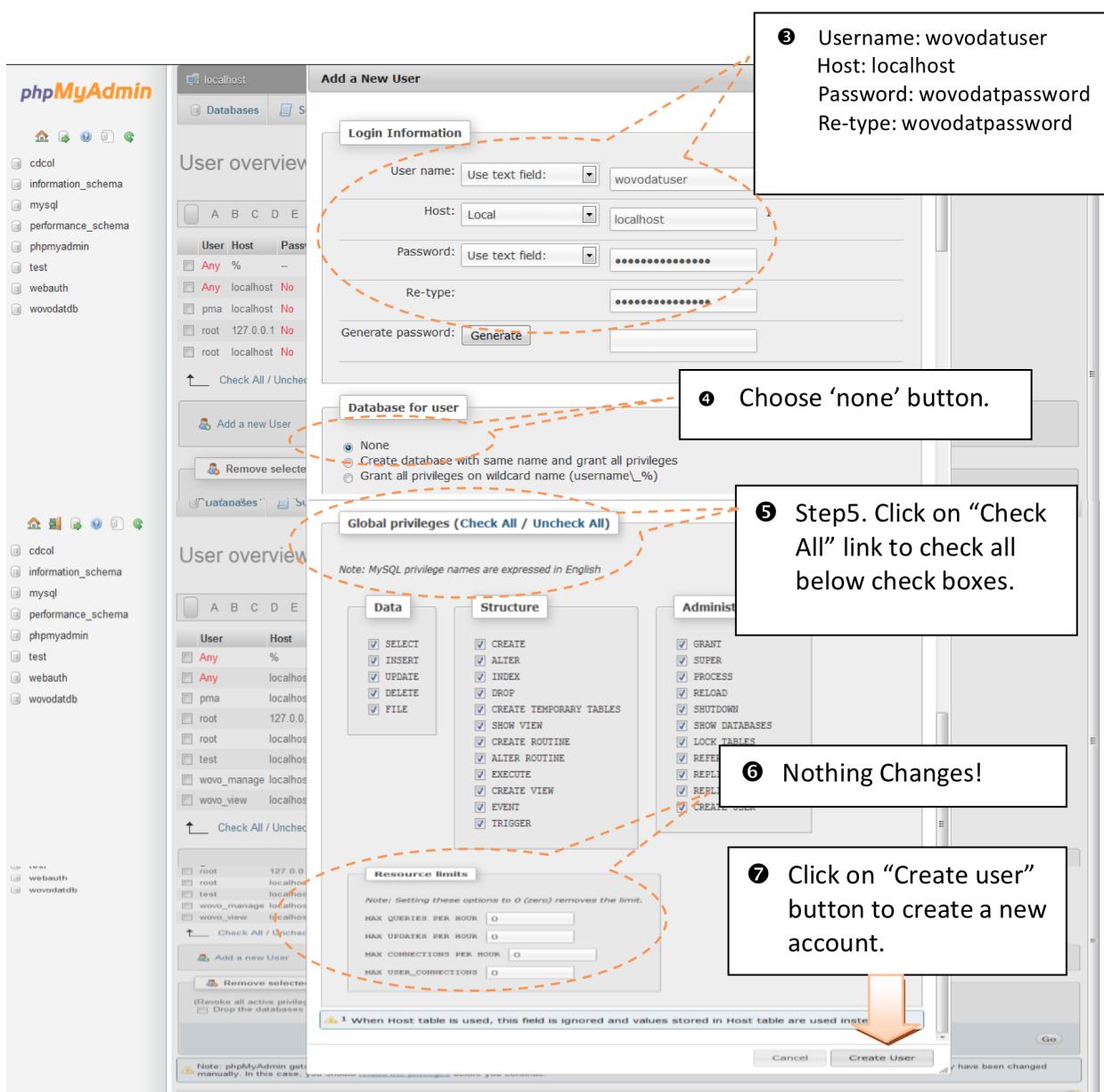


Figure 6. Create login information and setting up privilege using phpMyAdmin GUI

Configuration

After finish with the installation, the next step is to configure Apache2 and PHP5 for the WOVOdat website and the database.

- Configure the default site to **/home/wovodat/public_html/WOVOdat/**
Edit *default* file using *vi* or other editor:

```
% sudo vi /etc/apache2/sites-available/default
⇒ Replace the path /var/www with
/home/wovodat/public_html/WOVOdat/
```

- Refer to the sample default file below:

```
<VirtualHost *:80>
    ServerAdmin webmaster@localhost
    DocumentRoot /home/wovodat/public_html/WOVOdat
    <Directory />
        Options FollowSymLinks
        AllowOverride None
    </Directory>

    <Directory /home/wovodat/public_html/WOVOdat>
        Options Indexes FollowSymLinks MultiViews
        AllowOverride None
        Order allow,deny
        allow from all
    </Directory>

    <Directory /home/wovodat/public_html/WOVOdat/output>
        Options Indexes FollowSymLinks MultiViews
        AllowOverride None
        Order allow,deny
        allow from all
    </Directory>

    ScriptAlias /cgi-bin/ /usr/lib/cgi-bin/
    <Directory "/usr/lib/cgi-bin">
        AllowOverride None
        Options +ExecCGI -MultiViews +SymLinksIfOwnerMatch
        Order allow,deny
        Allow from all
    </Directory>

    ErrorLog /var/log/apache2/error.log

    # Possible values include: debug, info, notice, warn, error, crit,
    # alert, emerg.
    LogLevel warn

    CustomLog /var/log/apache2/access.log combined

    Alias /doc/ "/usr/share/doc/"
    <Directory "/usr/share/doc/">
        Options Indexes MultiViews FollowSymLinks
        AllowOverride None
        Order deny,allow
        Deny from all
        Allow from 127.0.0.0/255.0.0.0 ::1/128
    </Directory>
</VirtualHost>
```

- Change the mode of the “/home/wovodat/”

```
% sudo chmod 755 /home/wovodat -R
```

- Change the owner of the /home/wovodat/incoming to “www-data”.

```
% sudo chown -R www-data:root /home/wovodat/incoming  
/home/wovodat/region /home/wovodat/public_html/WOVOdat/output  
  
% sudo chown www-data:root /home/wovodat/login_history.txt
```

- Edit the *php.ini* to include /home/wovodat/PEAR

```
% sudo vi /etc/php5/apache2filter/php.ini  
⇒ Modify the include path entry as following:  
include_path = ".:/home/wovodat/PEAR:/usr/share/php"
```

- Restart Apache2

```
% sudo /etc/init.d/apache2 restart
```

- Using the web-browser and type in “<http://localhost>”. The website should appear in your web browser.

*For any inquiries and comments please contact WOVOdat developer team:
http://www.wovodat.org/populate/contact_us_form.php*