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WOVOdat as a worldwide resource to improve eruption forecasts

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During periods of volcanic unrest, volcanologists need to interpret signs of unrest to be able to forecast whether an eruption is likely to occur. Some volcanic eruptions display signs of impending eruption such as seismic activity, surface deformation, or gas emissions; but not all will give signs and not all signs are necessarily followed by an eruption. Volcanoes behave differently. Precursory signs of an eruption are sometimes very short, less than an hour, but can be also weeks, months, or even years. Some volcanoes are regularly active and closely monitored, while other aren't. Often, the record of precursors to historical eruptions of a volcano isn't enough to allow a forecast of its future activity. Therefore, volcanologists must refer to monitoring data of unrest and eruptions at similar volcanoes.

WOVOdat is the World Organization of Volcano Observatories' Database of volcanic unrest – an international effort to develop common standards for compiling and storing data on volcanic unrests in a centralized database and freely web-accessible for reference during volcanic crises, comparative studies, and basic research on pre-eruption processes. WOVOdat will be to volcanology as an epidemiological database is to medicine.

We have up to now incorporated about 15% of worldwide unrest data into WOVOdat, covering more than 100 eruption episodes, which includes: volcanic background data, eruptive histories, monitoring data (seismic, deformation, gas, hydrology, thermal, fields, and meteorology), monitoring metadata, and supporting data such as reports, images, maps and videos. Nearly all data in WOVOdat are time-stamped and geo-referenced.

Along with creating a database on volcanic unrest, WOVOdat also developing web-tools to help users to query, visualize, and compare data, which further can be used for probabilistic eruption forecasting. Reference to WOVOdat will be especially helpful at volcanoes that have not erupted in historical or 'instrumental' time and thus for which no previous data exist.

The more data in WOVOdat, the more useful it will be. We actively solicit relevant data contributions from volcano observatories, other institutions, and individual researchers. Detailed information and documentation about the database and how to use it can be found at www.wovodat.org.