

Development of the JVDN system (volcano observation data sharing system)

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In the integrated program for next generation volcano research and human resource development, we are developing the JVDN system (Japan Volcanological Data Network system) to centralize and share data from research institutes, universities, and government agencies, as well as data acquired through the project online, with the aim of promoting data utilization and collaboration to contribute to the development of volcano research and disaster resilience. The JVDN system has been in operation since 2019, and has been registering data from various organizations and further improving its functions based on users' requests. You can access it from the WEB site, <https://jvdn.bosai.go.jp>. As of January 2023, data from 11 organizations have been registered, we will report the status of development, utilization, and future development of the JVDN system.

The main functions of the JVDN system are data display, download, and registration. The GIS screen can display observation station information, seismic source distribution, GNSS and tiltmeter vector maps, SAR interferograms, and ash fall survey results. Graphs can display baseline length changes between GNSS stations, tiltmeter data, average amplitudes of seismometers, and other data. In addition, photographic data and seismograph waveform images can be displayed. These image data and the raw data from which they are derived can be downloaded and used for research and other purposes. To download the data, you need to register as a user of the JVDN system and apply for the use of the data. In addition, data can be registered by applying to the NIED for data registration. There is also a group function to share data only among the parties involved in joint research. The system also has a page that displays not only historical data but also real-time data upon user request. For detailed information on how to use the system, please refer to the User's Guide provided on the JVDN system website.

The number of registered users of the JVDN system is gradually increasing, and as of January 2023, there are about 180 registered users. Some users download data from the JVDN system and use it for research and other purposes, and in 2020, the Cabinet Office established the "Ashfall Survey Data Sharing Scheme" to quickly share ashfall survey data among related organizations in the event of an eruption, in which it was decided that the JVDN system would be used for this purpose. In the case of the eruption of Mt. Aso in October 2021, the ashfall survey team established under the scheme used the JVDN system for rapid data sharing. This data is being used not only for research but also for disaster response.

We are continuing to register new data and improve the functions of the system in response to user requests. To further promote data utilization and collaboration, we propose a state transition diagram that expresses the transition of volcanic activity in terms of transitions in the state of volcanic activity. In line with this, we are considering upgrade of the JVDN system so that data can be handled comprehensively. In general, volcano disaster response by the Japan Meteorological Agency (JMA) and other organizations deals with multi-item data in a comprehensive manner, and the state of volcanic activity is considered in this context. On the other hand, in volcano research, data are not often handled comprehensively because the JVDN system has not existed until now, and research is conducted mainly using data from different fields. As a result, research necessary for volcano disaster response, such as how to classify the state of volcanic activity, changes in the state, and the different social impacts of each state, has not progressed. We believe that this upgrade will contribute to volcano disaster prevention as well as promote data utilization and collaboration across disciplines.

Keywords: Database, volcano observation, GIS, open data, interdisciplinary collaboration