

# Research collaboration, hazard modeling and dissemination in volcanology with Vhub

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## What is Vhub?

Vhub (online at [vhub.org](http://vhub.org)) is a cyberinfrastructure for collaboration in volcanology research, education, and outreach.

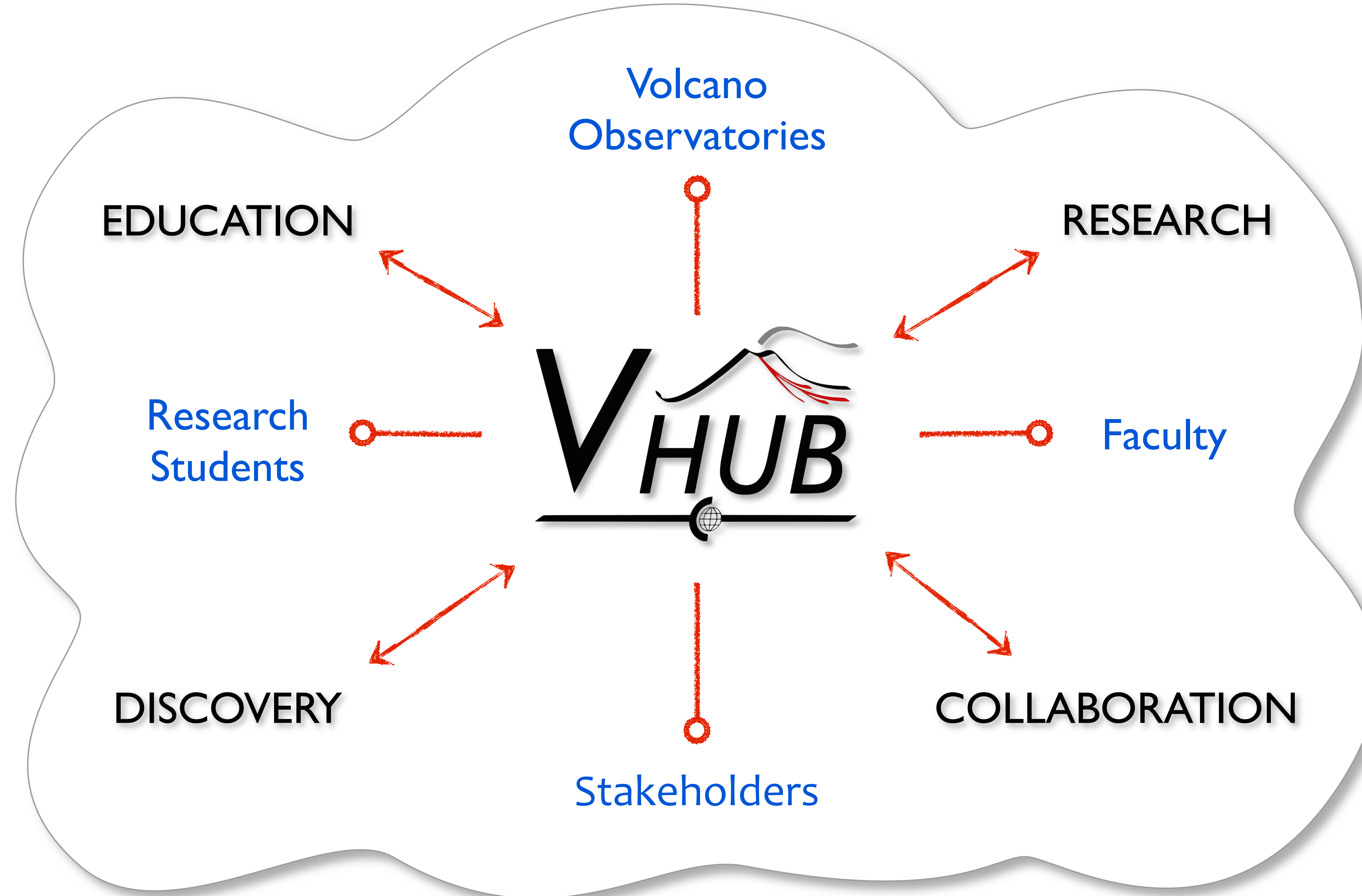
One of the core objectives of this project is to accelerate the transfer of research tools to organizations and stakeholders charged with volcano hazard and risk mitigation (such as observatories). Vhub offers a clearinghouse for computational models of volcanic processes and data analysis, documentation of those models, and capabilities for online collaborative groups focused on issues such as code development, configuration management, benchmarking, and validation. A subset of simulations is already available for online execution, eliminating the need to download and compile locally. In addition, Vhub is a platform for sharing presentations and other educational material in a variety of media formats, which are useful in teaching university-level volcanology. VHub also has wikis, blogs and group functions around specific topics to encourage collaboration and discussion.

Examples of the current Vhub capabilities include:

- (1) tephra dispersion and block-and-ash flow models;
- (2) shared educational materials;
- (3) online collaborative environment for different types of research, including field-based studies and plume dispersal modeling;
- (4) workshops and courses.

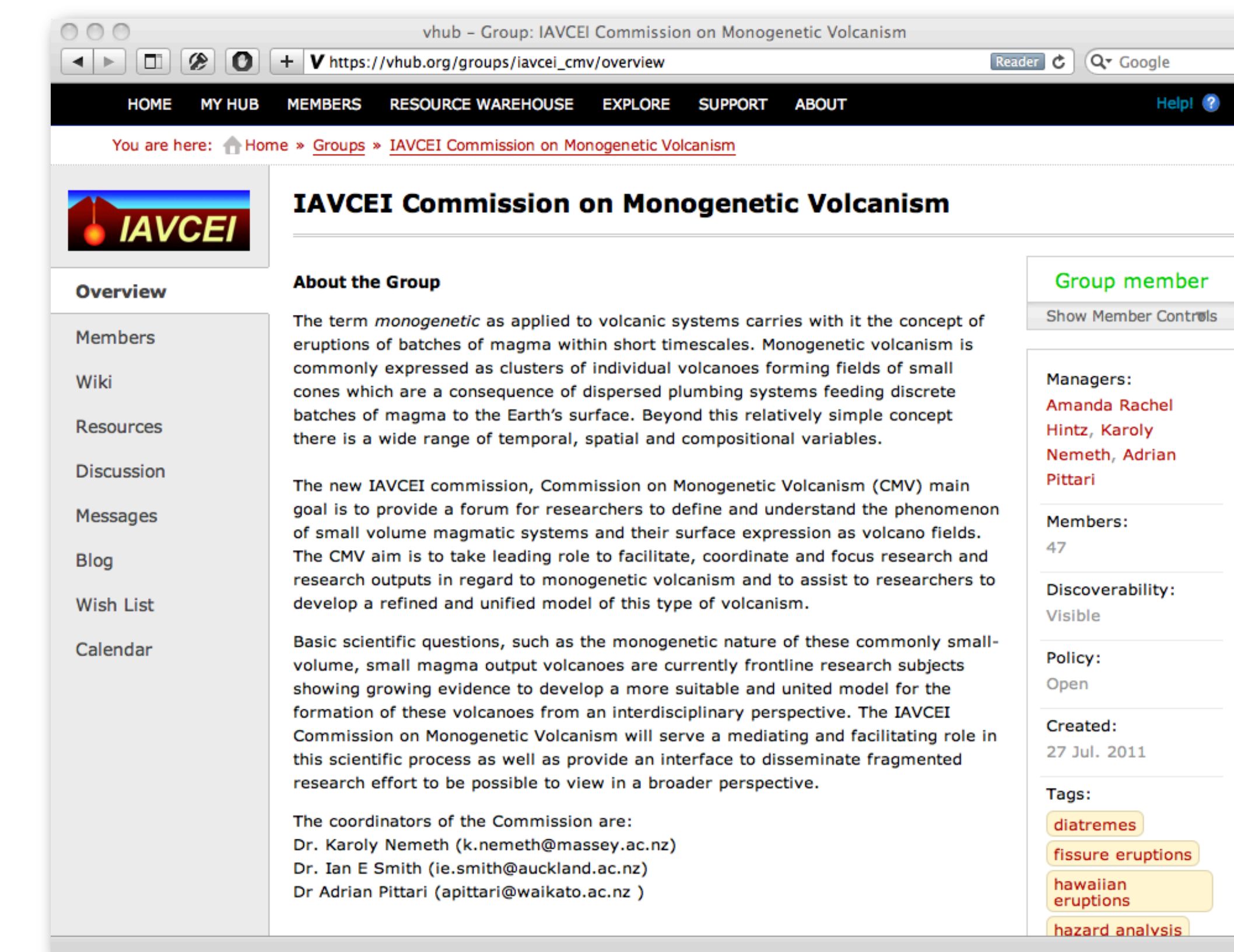
Future goals include implementation of middleware to allow access to data and databases that are stored and maintained at various institutions around the world.

All of these capabilities can be exercised with a **user-defined level of privacy**, ranging from completely private (only shared and visible to specified people) to completely public.



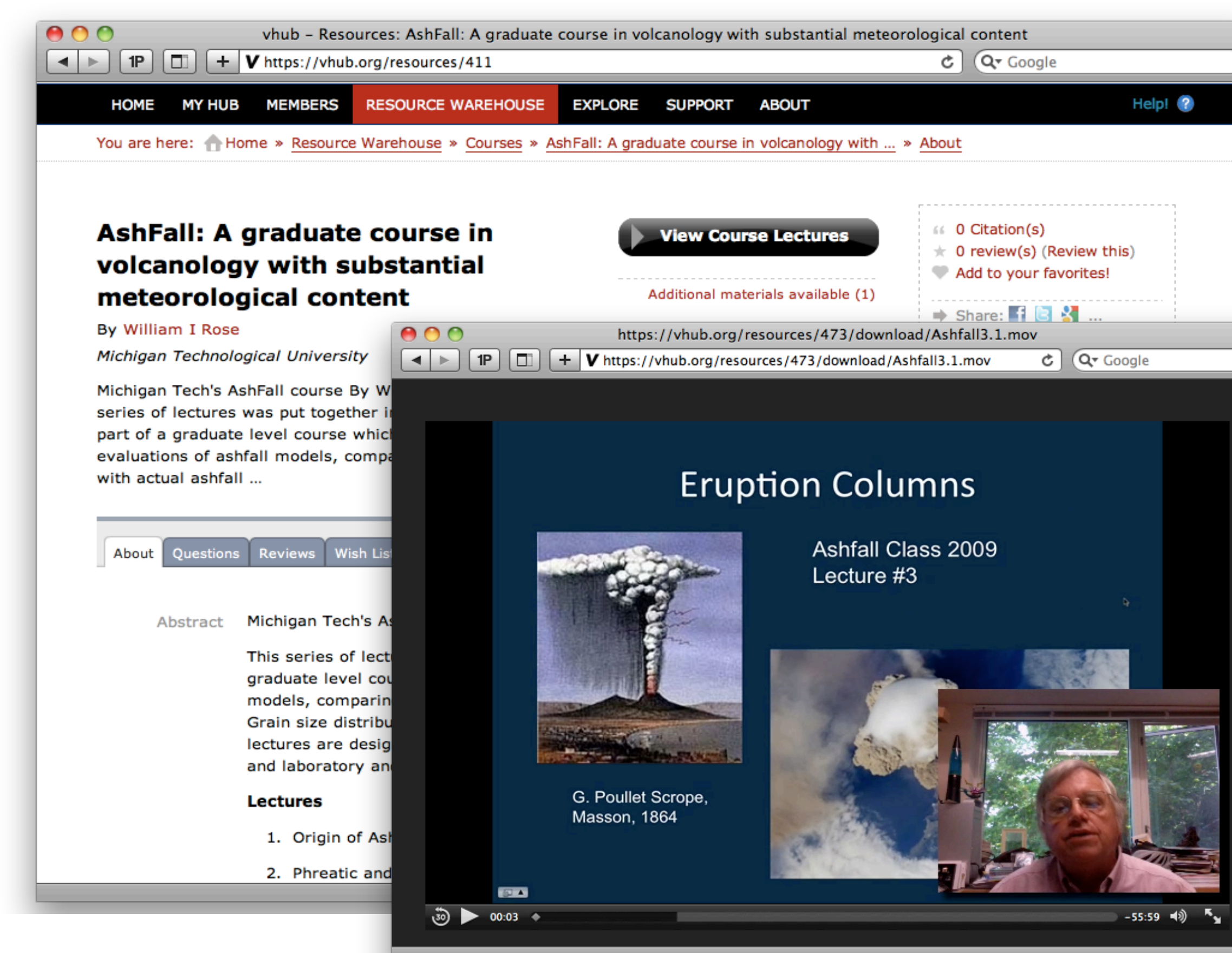
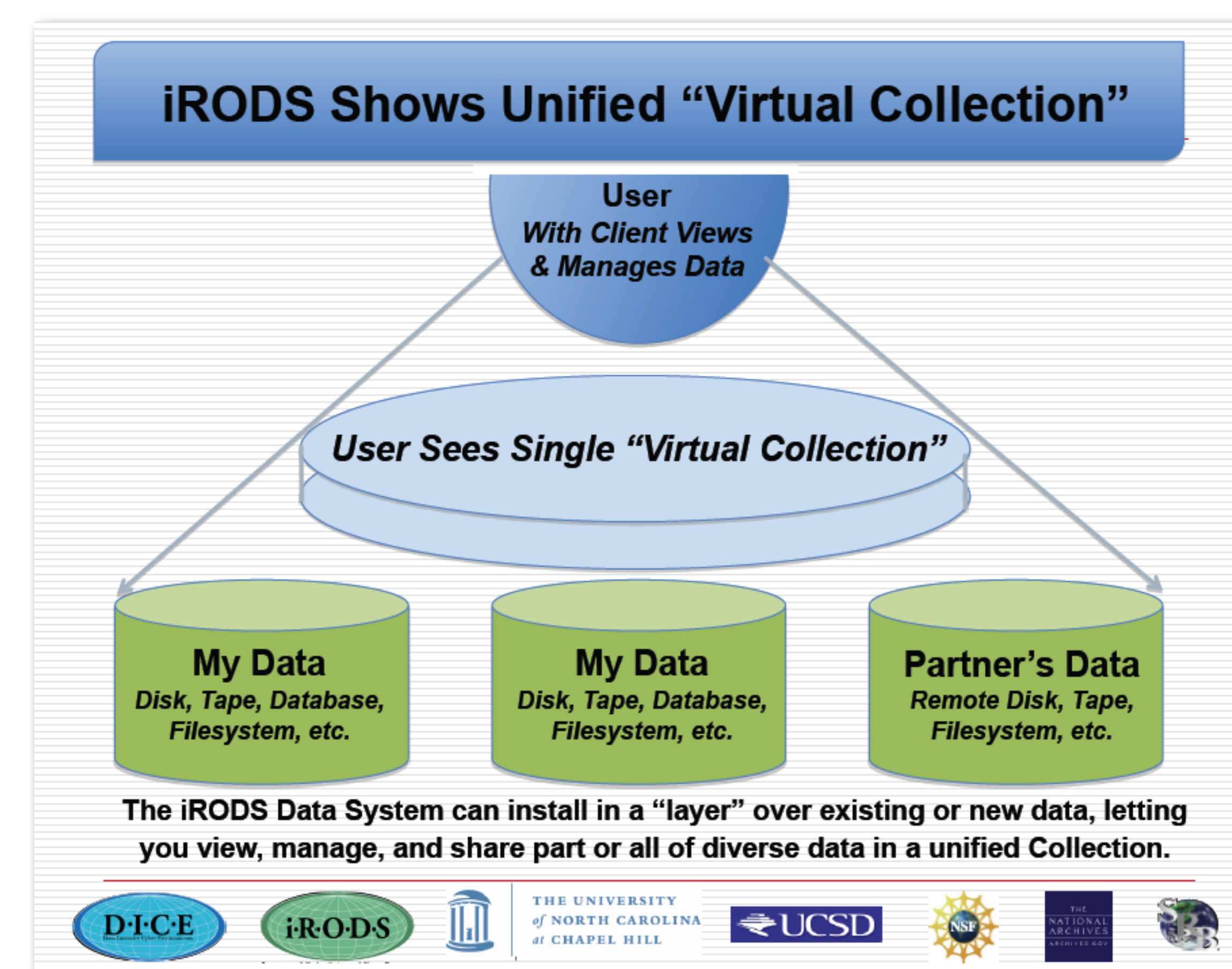
## Collaboration groups

- Very useful for collaborative projects involving multiple institutions
- Archive of entire project (documents, data, results, discussions) in one location
- Ideal for collaboration using VHub simulation tools.



## Resources

- Resource repository: teaching material, courses, workshops, data sets, etc
- Topic pages (wikis), blogs, Q&A, events
- Three levels of privacy: public, protected, private

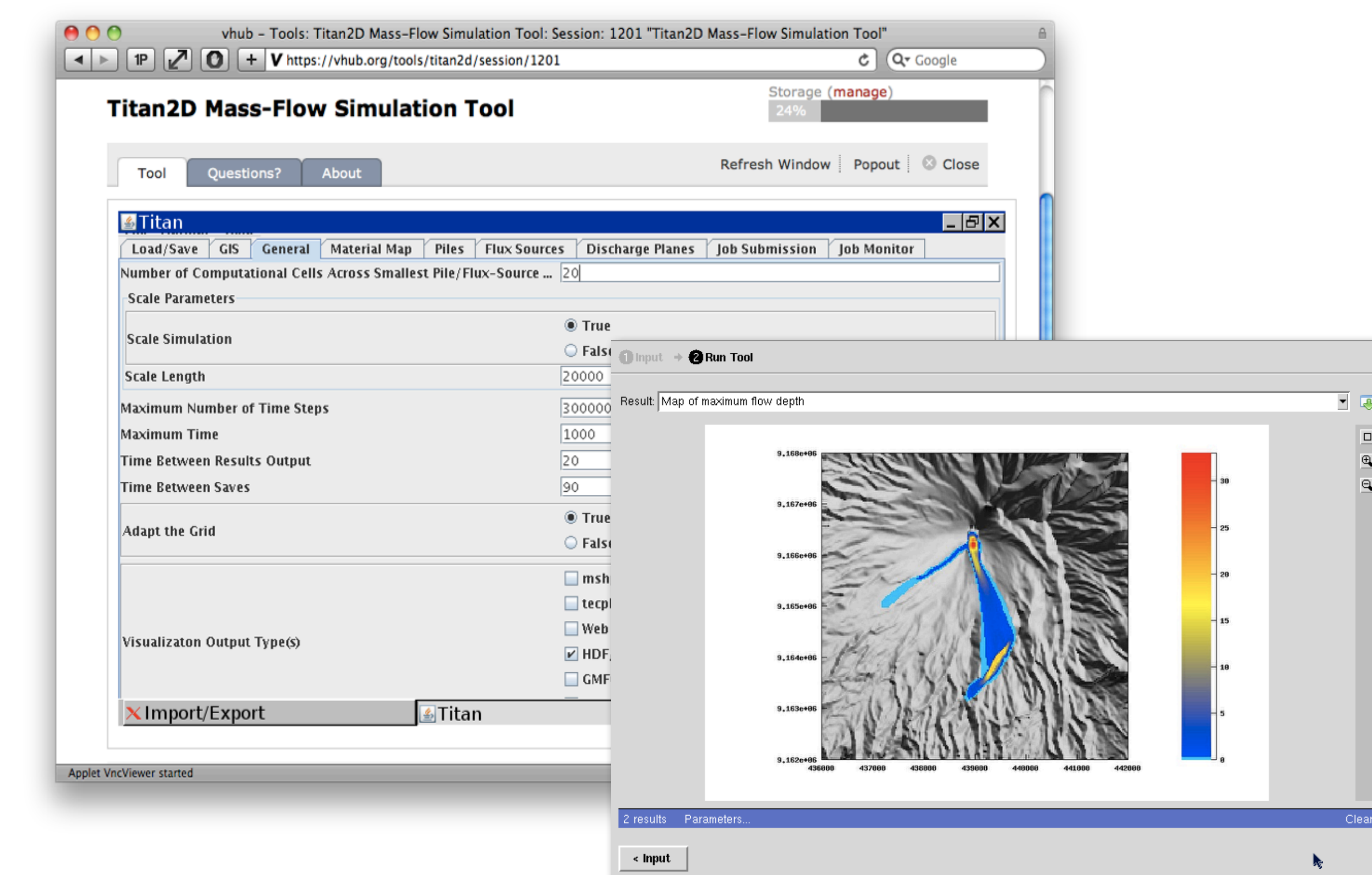


## How can Vhub help volcano monitoring and hazard assessment?

1. Tool-oriented display and analysis of monitoring data (e.g. remote sensing data from public repositories; data acquired at observatories)
2. Sharing monitoring data with iRods (access to data servers)
3. Communication and collaboration with other observatories or researchers from academic institutions.
4. Hazard modeling for different scenarios of eruptive activity.

## Online simulation tools

- Software applications accessed through a web browser; run on a remote machine; can be shared; different purposes: education, research, communication of data/results, etc.
- No installation necessary, "multi-platform", efficient delivery and high impact (easy access), use different types of media for tutorials and examples, no hardware incompatibility and since they run remotely they are "portable".
- Anyone can contribute. Can use many programming languages: C, fortran, java, octave, perl, python, ruby, tcl; so you can use your old programs!, no need to migrate code
- Easy deployment with Rappture (GUI), a xml based constructor that works as interface between the GUI and the code.



**The volcanological community is encouraged to use the resources of Vhub and also to contribute models, datasets, and other items that authors would like to disseminate.**

The project is funded by the US National Science Foundation and includes a core development team at University at Buffalo, Michigan Technological University, and University of South Florida, along with a group of collaborators from the international community. The VHub servers reside at Purdue University and the basic software infrastructure is also maintained there (see [hubzero.org](http://hubzero.org)).