

The Right to Research

A government agency may have robbed the U.S. scientific community of the chance of a lifetime

BY SUSAN WEST

The week after the May 18 eruption, a geological consultant for an industry worried about the effects of Mt. St. Helens called the U.S. Geological Survey in Vancouver, Wash. He asked why he hadn't been told about the extent of recently sighted mudflows and mentioned that they could be harmful to his client's operation. He suggested that, because of his client's particular concerns, he ought to do an aerial survey to evaluate the hazards. He was told that when it comes to analyzing the hazards from Mt. St. Helens, "The U.S. scientific community will speak with one voice and it will be the voice of the U.S. Geological Survey."

Another geologist, after his permit to the restricted zone surrounding the volcano was refused, asked a Survey scientist for the data he had been unable to collect. He was turned out of the office and told, "The Survey has never opened its field notebooks to outsiders and it's not about to start now."

These are not isolated examples, according to university and industry scientists who have tried to do research at Mt. St. Helens. By an aggregate of actions, attitudes and circumstances, they claim, the U.S. Geological Survey has effectively halted the free flow of scientific information from the volcano. While not accusing the agency of developing a stated policy of exclusion, these scientists maintain that the Survey, has, in effect, assured themselves sole rights to research within the restricted zone around the mountain.

"The Survey has just about monopolized the area," says a researcher from a local university, who like the others asked not to be identified. "They are too large an organization, just overwhelming." Says another, "They are like a small child with a sucker — they won't let go."

Faced with the delicate play between safety and the scientific right to know, the USGS has fumbled the ball, say the researchers, with the result that much important information is being lost daily in the rapidly changing environment. By excluding experienced volcanologists, particularly researchers familiar with the Cascades, the Survey, some researchers

contend, is robbing itself of expertise that may help evaluate Mt. St. Helens's future activity. Moreover, they argue, the fact that so few researchers have access to the mountains, compounded with the Survey's restrictions on release of data, means that Mt. St. Helens may never be subject to the scrutiny and interplay of interpretations that are an integral part of science.

"It conjures the image of one blind man studying an elephant and not allowing any other blind men to touch it," says a researcher who once studied the area as a field assistant for the USGS. "So what we get is a fount of knowledge on the trunk or the leg or the tail. We get no replication, no comparison. The Survey can't possibly get the entire picture. . . . We need the multiplicity of ideas that are a part of the process of science."

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As the government agency responsible for mapping and evaluation of geologic hazards, the USGS moved a team of scientists to Vancouver, Wash., soon after activity began at Mt. St. Helens in March. A contingency plan was rapidly developed that gave the U.S. Forest Service control over ground access to a restricted zone that was established around the mountain, and the Survey was designated as the scientific consultant to the Forest Service and other agencies. The Survey was immediately besieged with requests from researchers who wished to conduct studies within the restricted zone. In order to handle the deluge, the agency asked John Allen, professor emeritus at Portland State University, and Ralph Mason, former state geologist with the Oregon Department of Geology and Mineral Industries, to form a committee to evaluate the requests.

But this system offers little satisfaction. Armed with permits approved by Allen's committee and loaded with the required safety and emergency equipment, many researchers are still turned away at the entry points to the restricted zone. More than one claim that the Survey is responsible for their being denied entry.

"Despite the fact that many think we are responsible [for the lack of access], we are not — the Forest Service handles the land access," maintains Robert Christiansen of the Survey's Menlo Park, Calif., office and a temporary chief scientist of the emergency staff.

But several scientists point out that "somebody is telling the Forest Service who to let in and who not," and they contend that the choices often depend on an individual's relationship with the Survey and if the researcher's work conflicts with

that of the Survey. "Those with something the Survey can use get in," says one scientist, and he notes that a geologist who wanted to land on and photograph the top of the mountain after the eruption — something Survey geologists did not want to attempt — was told, "Go ahead and apply for a permit to go up, and we won't block you." "If they aren't blocking people, why say 'We won't block you'?"

Robert Tilling, director of volcano studies at USGS headquarters in Reston, Va., confirms that the Survey comments to the Forest Service on proposed studies, but denies that "favorites" are played. "We are asked by the Forest Service how a particular study fits in, but the Forest Service has final say. . . . We of course want to get anybody in who has a real need to get in."

Many scientists, unable to gain ground access by any means, have requested data from the Survey. The response has not been encouraging. Even a consultant to a local utility, which according to the contingency plan has a priority need for such information, has been unable to obtain all the data he requests. "One thing we need is information on the volume of the pyroclastic flows . . . we need the thickness of ash deposits on the flanks of the volcano . . . we were never given data on tilt or the locations of the geodetic network . . . we need to confirm our computer calculations," he said. One researcher who did gain access and collected samples and wished to compare his results with those of the Survey said, "They refused to give me information on their water samples, soil samples. . . . They say they don't have it. I know they've collected [them] because I've seen them doing it."

Part of the problem, says Don Peterson, one of the temporary chief scientists in Vancouver, is the Survey's rules on the release of data. Under normal circumstances, he explains, USGS data are available on request following the publication of professional papers. In this way, he says, "All the data are available to everybody under the same circumstances."

It comes down to the basic question: Should a federal agency be involved in basic research?

The situation at Mt. St. Helens, however, doesn't allow for the drawn-out process of publication. "We are trying to work out these problems," he says. "We have to consider, on a case by case basis, what people need. If the need is established, we will try to accommodate them."

"In most cases," says volcano studies director Tilling, "our scientists stand ready to cooperate with people. I haven't gotten direct word that our scientists have turned anyone down."

Of those cases he hears of "indirectly"

he says, "Normally it turns out that they didn't know who to ask . . . and went away unhappy. There are few instances I know of that someone was turned down. There is no reason for us to do that; there is plenty of work for everybody."

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Moreover, Tilling says, the usgs's small staff and the demands of the situation make it difficult to satisfy researchers' requests. But while the usgs continues to bemoan the lack of field scientists and the overwhelming task of monitoring the volcano, "all the universities are lined up waiting to get in."

According to one scientist who has repeatedly offered his services to usgs field teams, "A lot of the projects we've mentioned and we know they aren't doing, we see them out there doing the next day. So they aren't thinking of everything, but they won't let us help them." Often scientists get a classic runaround: "They say they don't want duplication in the field. So you try to find out what's being done and they won't tell you. Then you suggest something and they say it's being done. Then you ask for the results and they won't give them to you."

Many of the problems boil down to what is apparently an old sore spot in the geologic community: "It comes down to the basic question: Should a federal agency be involved in basic research?" Over the years, these scientists say, usgs scientists have become increasingly involved in basic research, and "there is always a conflict" between their roles in the publish-or-perish world of science and their roles as part of an agency assigned to hazard evaluation. Mt. St. Helens brings the conflict into focus: The most expedient way to handle a hazardous situation is to limit the number of persons who have access to information, but in doing so the Survey has assured that they will be the ones to publish, while others perish for lack of data. This is not the role that most scientists envision for a government agency: "One would think that the federal government would be out there to help the community of scientists rather than make more rules and make things more difficult."

None of the scientists interviewed by SCIENCE NEWS feels that the agency is deliberately withholding information or trying to prevent research from going on. "Some things happen by default," says one. "I got to know some of them and I can't believe from talking to them that they would keep people out." All agree with Tilling, who says, "It's a difficult trade-off between what is safe and what needs to be

done now." He adds, "The situation has caused our people a lot of grief. It's put them in the role of policemen and they don't have that ability and it doesn't make them very popular." But researchers maintain that the police role is unnecessary: "Scientists have always reckoned these risks well worthwhile. There is no real excuse for restrictions, other than a waiver of liability, to unlimited access by scientists," says one in a letter.

However, says one scientist who has worked closely with the Survey, the agency is mindful of a recent volcanic episode where too many scientific cooks with too many hypotheses brewed an embarrassing stew. In 1976, when the volcano La Soufrière began rumbling on the Caribbean island Guadeloupe, volcanologists could not agree on what the volcano might do next or on the need for evacuation. Lacking any scientific guidance, local authorities moved more than 70,000 people from the area for 15 weeks, creating tremendous social and economic burdens for the island. In part to assure that conflicting scientific opinions do not create a similar, potentially hazardous situation in Washington State, suggests this scientist, the usgs is releasing few data.

Regardless of the reason, "It's an inhibition of our right to information by the federal government," and these researchers feel the situation could have been handled better from the start. In a letter to a federal official, one researcher claims, "The present complicated and multiple restrictions . . . [are] preventing complete coverage of one of the most important scientific events of the century. The highly competent U.S. Geological Survey scientists have not (and never have been) able to monitor all the aspects of any geologic event, much less one of this magnitude. Geology has always relied upon professional competence outside the Survey."

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Pointing out that most U.S. experts in volcanology are not employed by the Survey, these researchers suggest that an advisory board of university, industry and government scientists should have been established to direct the research effort. "Obviously, the Survey should have called together local scientists and other volcano experts, but they never have—never got in touch with them at all."

According to Tilling, such a committee may be in the planning stages—albeit four months after Mt. St. Helens first erupted and two months after its historic blast. Says Peterson, who has encouraged the formation of an advisory board: "We've got to do something. The Survey is opening itself to heavy criticism if it seems to have exclusive rights to the mountain." □

. . . Volcano

taking a no-holds-barred approach to trying to predict Mt. St. Helens's next move. A prime candidate for a predictive tool is the volcano's seismic activity, since earthquakes are assumed to be the external signal for the rise of magma. Before the eruptions of May 25 and June 12, for example, the amplitude of harmonic tremor—a constant, rhythmic movement of the earth usually detected at volcanoes—built gradually to a peak, dropped off sharply and built again immediately before the explosions. Similar patterns have been observed at Japanese volcanoes, says John Dvorak of the usgs. No harmonic tremor, however, preceded the July 22 eruption. University of Washington seismologists detected a series of small quakes—most less than magnitude 2—that increased in frequency throughout the day; that sort of sequence, if better understood, may also be useful in prediction, they note.

Based on studies in Hawaii and Iceland, other researchers are trying to piece together geological clues and the emissions of gases such as sulfur dioxide, hydrogen and carbon dioxide. With researchers from the usgs, Stoiber and co-workers from Dartmouth have been monitoring SO₂ emissions since shortly after the May 18 eruption. According to Tom Casadevall of the usgs, the SO₂ emissions increased from a rate of 30 tons per day to a rate of 100 to 250 tons per day during a three-week period after the May 18 eruption and rose again to a rate of 1,000 tons per day in early June. The researchers have also recently installed instruments to measure carbon dioxide emissions from the crater as well as hydrogen gas, which diffuses through the rock as magma moves inside the volcano. There may be a correlation, suggests Casadevall, between an increase in gas emissions and the onset of harmonic tremor and swelling, or inflation, of the volcano. At least one such event occurred in late June, says Casadevall, and the researchers hope to see others.

Whatever Mt. St. Helens decides to do next—and the most recent explosion points out that the show is far from over—scientists stand only to gain, says Tilling. By catching a volcano in the act, researchers will be able to study many aspects of the volcano's behavior that are not preserved in rocks from past eruptions, Hopson points out. "We will learn as much from this as possible on how to better do hazard assessment and build on this to analyze the hazards from other volcanos," says Tilling. To that end, the Survey has requested funding to establish a permanent Cascade volcano monitoring system. If approved, the system may allow researchers to distinguish small-scale precursory changes from normal variations or cycles in such behavior as seismic activity or inflation of the volcano. In the meantime, the long-reticent maiden continues to remind her geologic suitors that the full story is not yet told. □