DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

The Role of the U.S. Geological Survey in Providing Information to News Media About the 1980 Eruptions of Mount St. Helens

by

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ABSTRACT

The eruptions of Mount St. Helens volcano in Washington, one of the major national and international news stories of 1980, involved the U.S. Geological Survey (USGS) in more news coverage than any other event in its history. Most geologic information about the volcano came from monitoring and research by geologists, geophysicists, hydrologists, and other scientists and technicians of the USGS. In contrast, most information on rescue operations and many other non-geologic topics was supplied by the U.S. Forest Service, Federal Emergency Management Agency, State of Washington, and local government agencies. Information was disseminated at news conferences, interviews, news pools of reporters and cameramen on trips to the volcano, television and radio appearances, news releases, public meetings, and informal discussions with reporters. Gathering and releasing information required a cooperative effort between the various agencies. By assisting news representatives, this cooperation provided background information on a complex story while limiting disruption to working scientists and minimizing dangers to reporters and scientists. Lessons learned during the overall effort may assist government agencies in dealing with future natural disasters.

INTRODUCTION

Mount St. Helens captured immediate public attention in March of 1980 when it awakened after lying dormant for 123 years. Not since the eruptions of Lassen Peak in northern California during 1914-1917 had a volcano erupted in the conterminous United States. Unlike Lassen Peak, however, Mount St. Helens is located near major cities, including Portland, Vancouver, Tacoma, and Seattle (fig. 1), and as a result the eruptions had a large and keenly concerned local audience. In addition, the potential of the eruptions to cause death and destruction and the unusual and photogenic nature of the volcanic activity quickly excited national and international interest.

This report documents techniques used and lessons learned during involvement by the U.S. Geological Survey (USGS) with the news story of Mount St. Helens after the cataclysmic eruption of May 18, 1980. Our experiences may aid the USGS or other scientific organizations should they be thrust into the center of future major news events. This report is not a comprehensive discussion of the entire news story, for we are only marginally familiar with the exhaustive activities by other agencies or various news media to gather and disseminate news about the volcano. Thus this report contains relatively sparse references to other organizations, some of which played roles in the overall news story that were equal to or greater than the USGS. This report is written from the perspective of scientists, and we intend it to aid other scientists who might find themselves in similar situations. Therefore we give special emphasis to the role of Information Scientist for Mount St. Helens, a position temporarily held by each of the authors. The position was

established to meet the large number of requests for technical information about the volcano. This was the first time that the USGS used a scientist as a full-time news spokesman on a long-term basis.

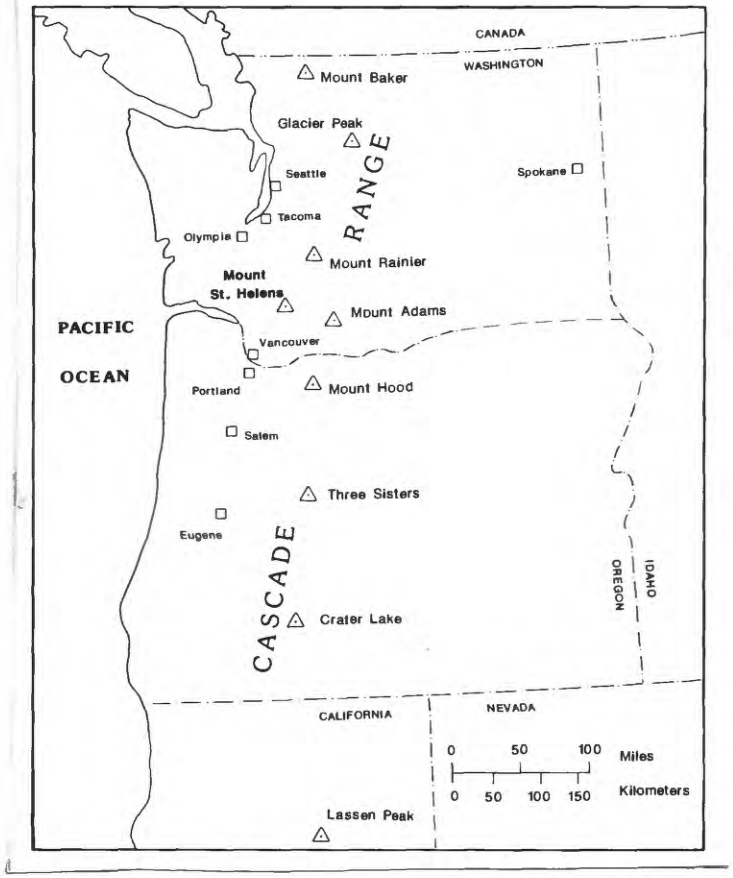

Figure 1. Location of Mount St. Helens relative to population centers and to some of the other volcanoes of the Cascade Range.

BACKGROUND

With the start of seismic activity at Mount St. Helens in late March 1980, the USGS and the U.S. Forest Service began hazards assessment, monitoring, and research on the volcano (Miller and others, 1981). Scientists rushed to Vancouver, Wash., where the scientific and emergency effort was coordinated. Many of these scientists were from the USGS, which under the Disaster Relief Act of 1974 is required to analyze geologic hazards and "* * * to provide technical assistance to insure that timely and effective warning is provided." The responsibility of the USGS included assessment of the changing state of the volcano and evaluation of the nature of potential eruptions to help save lives and prevent injuries. In contrast, the Forest Service had the major responsibility of making and enforcing safety regulations and procedures. A Coordinator of the USGS operations oversaw the geologic monitoring, hazards assessments, and research by the USGS on the mountain. A USGS Volcanic Hazards-Assessment Coordinator analyzed potential hazards and

notified government agencies, USGS news spokesmen, and other officials of impending dangers (Miller and others, 1981). Analysis of volcanic hazards followed established practices developed by the USGS (Miller and others, 1981; Mullineaux, 1981) and other organizations (Warrick, 1975; Bolt and others, 1977; Sheets and Grayson, 1979).

Volcanic research at Mount St. Helens was built on knowledge about other volcanoes, including expertise from decades of monitoring at the Hawaiian Volcano Observatory as well as earlier volcanologic and volcanic-hazards studies of many of the volcanoes in the Cascade Range (for example, Crandell and others, 1979). Mount St. Helens itself had been studied for years and was recognized as the volcano in the conterminous United States that had been the most active and explosive during the last several thousand years (Crandell and others, 1975). Reports of this early research at Mount St. Helens (Crandell and others, 1975; Crandell and Mullineaux, 1978), in fact, predicted that an eruption is "* * * likely to occur within the next hundred years, and perhaps even before the end of this century." The USGS Public-Affairs Office issued news releases about the conclusions in these reports when they were published, and in 1978 the Director of the USGS issued a Notice of Potential Hazards, all of which raised public awareness of potential danger from Mount St. Helens.

Part of the overall responsibility of the USGS is to translate scientific information on volcanoes into language that can be readily understood by government officials, news reporters, and the public. At Mount St. Helens, this translation was done by USGS scientists and public-affairs officers and also by Forest Service and Federal Emergency Management Agency (FEMA) public-affairs officers. These officials met with reporters during news conferences, interviews, trips to the volcano, television and radio appearances, public meetings, and informal contacts. Within a week after the disastrous eruption of May 18, a series of full-time Information Scientists, who were geologists or geophysicists with the USGS, were designated as news spokesmen in Vancouver for information about volcanic and scientific activity at Mount St. Helens. During the period of seismic and eruptive activity, the USGS cooperated with the Forest Service, FEMA, the State of Washington, and other agencies, all of which disseminated geologic and nongeologic information.

As pre-1980 research on Mount St. Helens helped scientists know what to expect in 1980, so will research on the volcano during and after 1980 provide data to forecast future behavior of this and other volcanoes. Mount St. Helens has become the world's most studied explosive volcano (Harnly and Tyckoson, 1984). Reports published and being written on Mount St. Helens by scientists of the USGS and many other organizations will thus help save lives and property in the future. Some of the many published reports are the volume edited by Lipman and Mullineaux (1981) and popular accounts by Foxworthy and Hill (1982) and Tilling (1985).

HISTORY OF GEOLOGICAL SURVEY NEWS SERVICES ABOUT MOUNT ST. HELENS

The Mount St. Helens 1980 news story began with a 4.2-magnitude earthquake under the mountain on March 20, 1980. As part of a routine USGS program of reporting significant earthquakes worldwide, Public-Affairs Officer D. R. Finley telephoned information on the earthquake to United Press International and Associated Press less than 2 hours after the event. Direct USGS involvement began on March 21 with a telephone request from the U.S.

Forest Service for information. The USGS became increasingly involved in the following days as telephone conferences rapidly increased between employees of the USGS and several agencies. Public interest also rapidly increased as earthquake activity mounted, especially after scientists forecast that volcanic eruptions might occur soon. National news releases on the continuing activity were issued with increased frequency by the USGS Public-Affairs Office.

Geologist D. R. Mullineaux of the USGS arrived at Vancouver on March 25 to provide technical assistance on Mount St. Helens to the Forest Service, State and local agencies, and private organizations. Other USGS geologists, geophysicists, and hydrologists arrived during the next few days to study the awakening volcano (fig. 2). Facilities and logistics for news distribution were initially provided by the Gifford Pinchot National Forest headquarters in Vancouver, which administers U.S. public land on and near Mount St. Helens. In Vancouver, information about the volcano was released first by the U.S. Forest Service through its Public Information Office, which shortly thereafter operated 24 hours a day. The USGS Public-Affairs Office continued to provide information to the news media from its headquarters in Reston, Vir., and from its Regional Research Centers in Denver, Colo. and Menlo Park, Calif.

Figure 2. View of Coldwater I observation post on April 11, 1980. The northwestern side of Mount St. Helens, about 12 km away, is dimly visible in the background. Compare this picture to figure 5, taken after the eruption of May 18, 1980. Photograph by C. D. Miller.

By March 26, Mount St. Helens and nearby areas had been closed to the public based on decisions arrived at during meetings between the Forest Service, USGS, and other agencies. Early on March 27, about 4 hours before the initial eruption, a Hazard Watch for Mount St. Helens was issued by the USGS. Public and news interest increased abruptly with the first small steam eruption of March 27. Mullineaux, the on-site spokesman for the USGS, and other USGS scientists and public-affairs officers provided information to news media, public officials, and private citizens. Initially, the USGS participated in news conferences organized by the U.S. Forest Service in

Vancouver in the Gifford Pinchot National Forest headquarters building and later at a local motel were more space was available. Spokesmen from the Forest Service, State of Washington, local agencies, public utilities, and other organizations provided general information on local matters. Because attention was largely centered on when the volcano was likely to erupt and potential volcanic hazards, Mullineaux, and later D. R. Crandell and R. L. Christiansen, and sometimes other USGS scientists often became a focus of interest at these news conferences.

Because of many small eruptions, public interest about the volcano had so increased by the end of March that the Public-Affairs Offices of the USGS and Forest Service were flooded with work. Requests by news media to interview scientists were numerous, but only some of them could be granted; accomodating them all would have interfered with volcano monitoring. By early April, it became obvious that release of geologic information about the volcano needed to be streamlined and that a full-time geologic spokesman was needed to grant interviews and release news whenever needed. A scientist rather than a public-affairs officer was chosen because scientific competence and credibility were thought to be paramount requirements. Eruptions stopped during middle and late April, however, and news pressure subsided. The proposal for a USGS scientist as a full-time news spokesman was shelved, and the on-site public-affairs officer returned to his home base in mid-April; Forest Service officials and USGS scientists in Vancouver dealt with the dwindling number of news requests.

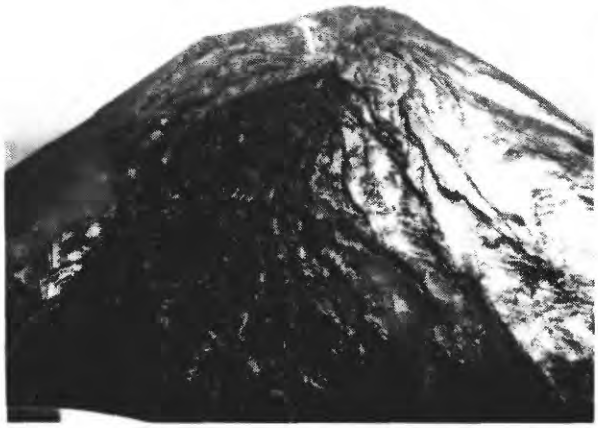

Figure 3. View of the northern side of Mount St. Helens on May 4, 1980, showing the highly fractured bedrock due to the bulging of the flank. Photograph by C. D. Miller.

Figure 4. Roadblock southwest of Cougar, Wash., September 1980. Roadblocks along main highways such as this were manned by highway patrolmen (car and camper on right). Photograph by Tau Rho Alpha.

On March 26 and later, the USGS issued statements and news releases about the potential hazards of eruptions (Miller and others, 1981). In late March, the USGS suggested that outward bulging and attendant fracturing of the northern flank of the volcano (fig. 3) could be dangerous if they continued. The Forest Service and State and local authorities tightened restrictions to

access near the mountain, and Pacific Power and Light Company further lowered the water level of nearby Swift Reservoir to lessen hazards from flooding (Miller and others, 1981). Yet scientific data can be interpreted in different ways; especially from mid-April to early May, many people doubted that the eruptive activity heralded serious problems. There even developed considerable public pressure to reopen the Spirit Lake recreation area and to relax restrictions on logging and access around Mount St. Helens. Despite potentially high volcanic hazards, an influx of tourists fostered a holiday atmosphere during the days before May 18. Sightseers skirted roadblocks (fig. 4) to get on the mountain. Local entrepreneurs hawked souvenirs--T-shirts, ash trays, banners, etc. Yet the May 18 eruption largely proved the USGS hazards assessments; the fact that the local authorities took what precautions they did doubtless saved hundreds or thousands of lives (Decker, 1981; Miller and others, 1981; Tilling, 1985; Tanaka, 1986).

Figure 5. View of Coldwater I observation post on May 23, 1980, after the catastrophic eruption. The gaping crater of Mount St. Helens is in the background. Most of the visible area has been devastated. The roof of an automobile, in which photographer Reid Blackburn died, protrudes through new directed-blast and air-fall deposits. Photograph by C. D. Miller.

The cataclysmic eruption began when the bulging northern flank finally failed at 8:32 a.m. on May 18. An area of more than 550 square kilometers was devastated (fig. 5) and 57 persons died or were missing and presumed dead, including USGS geologist David A. Johnston, who had been on duty north of the mountain. Government agencies rushed to coordinate rescue operations, enforce access restrictions, prevent panic, and supply hazards information (Foxworthy and Hill, 1982). The eruption was featured in national and international radio, television, magazine, and newspaper coverage. News reports focused on damage, floods, loss of life, and rescue-and-recovery operations (Schuster, 1981, 1983) rather than on USGS activities. Yet factual data about the volcano was needed even more to quell confusion, apprehension, fear, and rumor.

Public-affairs officers and other members of the USGS and Forest Service continued to disseminate news, but many of

Public-affairs officers and other members of the USGS and Forest Service continued to disseminate news, but requests from media representatives for interviews with scientists were more than could be accommodated by scientists on the monitoring and hazard-assessment team. Thus a USGS Information Scientist was finally installed for Mount St. Helens, the first being geologist M. H. "Tim" Hait, Jr. (fig. 6), who arrived on May 20. This new position was greeted with suspicion by some news representatives because they felt they would no longer have direct access to scientists with whom they had become familiar. These misgivings were dispelled when Hait soon established a good rapport with reporters.

Figure 6. Geologist M. H. "Tim" Hait, Jr., the first Information Scientist, making a point at a news conference in late May, 1980, at the information center, Vancouver, Wash. Photograph by Walter Conner, FEMA.

After the catastrophic eruption of May 18, President Carter declared the Mount St. Helens region a Disaster Area, making Federal aid available through FEMA. On May 23 the Disaster Information Center of FEMA sent specialists in communications and journalism to Vancouver to coordinate and facilitate efforts by the various agencies to get information to news organizations and the public. Supervised by Phillip S. Cogan, FEMA Region 10 Public-Affairs Officer, the team established a central information center, into which information personnel of the USGS, U.S. Forest Service, and other agencies moved their operations. Information officers of FEMA and other agencies handled most routine calls about the volcano from news representatives; the Information Scientist and USGS Public-Affairs Officers handled requests for detailed scientific information about the volcano. Detailed in-depth interviews with other scientists were permitted as time allowed.

The FEMA information center occupied part of a long, unfinished room (fig. 7) on the third floor of a bank building in Vancouver, Wash. Here the Information Scientist, the Public-Affairs Officer, other USGS personnel, and a

secretary worked alongside 18 FEMA information officers and secretaries as well as employees from the Forest Service, Army Corps of Engineers, Small Business Administration, State of Washington, and other agencies. FEMA recording and transmitting equipment were used to make daily news reports, which radio stations could access by telephone. FEMA teletype machines, word processors, and a photographic department filled part of the room, and chairs, telephones, and a conference table were set aside for reporters in another part. News conferences were held on the second floor of the bank building.

Figure 7. A slack period during June, 1980, in the unfinished office area of the information center, where workers from various agencies answered telephones and met with representatives of news media. View looks down the two rows of desks, normally occupied by workers, including the USGS Information Scientist. FEMA Region 10 Director Robert Stevens walks up the aisle toward Phillip S. Cogan. Photograph by Walter Conner, FEMA.

Major explosive eruptions of Mount St. Helens took place on May 25, June 12, July 22, August 7, and October 16-18, 1980. Generally these eruptions became progressively smaller with time, and the interval between them was progressively longer. Information was disseminated 24 hours a day until the middle of the summer, when public interest began to wane. By the fall only one FEMA information officer, one Forest Service information officer, and the USGS Information Scientist remained. By the end of December 1980, the volcanic activity at Mount St. Helens had changed to nonexplosive building of a volcanic dome. The need for FEMA to cope with a disaster became much less, and they turned over operation of the information center to the Forest Service. After 1980, the Information Scientist has continued to work with a Forest Service public-information officer to supply data on current volcano monitoring and area restrictions and also has continued to provide news interviews and to give talks to local public and technical groups.

THE JOB OF INFORMATION SCIENTIST

The duty of the Information Scientist is to present information to the public, through news representatives and by other means, in a timely way and in understandable language. He or she is the prime USGS news-media contact in Vancouver, keeping research scientists free to pursue their work uninterrupted. The Information Scientist works in cooperation with the USGS Public-Affairs Office under the direction of the Scientist-in-Charge.

Those who served as Information Scientists may have preferred the simple hazards of field work at an erupting volcano to facing the awesome battery of microphones, cameras, and poised pencils. They soon developed, however, a common philosophy for the job: a desire to inform and teach about geology in general and about Mount St. Helens in particular. A prime element of public education is evaluating research data about Mount St. Helens and other explosive volcanoes, and presenting these analyses in a form understandable to news representatives and the public. The Information Scientist translated scientific words and concepts to reporters and editors who faced rigid deadlines daily and who had to report information in different ways than do scientists. Answers to reporters' questions generally needed qualification--which non-scientists often find frustrating and difficult to understand. The Information Scientists confined their presentations to facts or reasonable scientific interpretations, and tried to avoid preaching, suggesting policy, or proposing restrictions on public access to the mountain.

Typically, the Information Scientist began each day by reviewing events of the previous night by checking seismograms, tiltmeter charts, and other data recorded at Vancouver from instruments deployed on or near Mount St. Helens. A telephone call obtained the latest information on earthquake activity from the seismologic laboratory at the University of Washington in Seattle, where University of Washington and USGS seismologists monitored and analyzed incoming data from a broad seismic net throughout the day and night. Most information came from the geologists, geophysicists, and hydrologists working at the volcano. Because these scientists were in the field during the day, they could be contacted only at night or early morning. During most of 1980, group review sessions were held two to three times a week.

Participating in news conferences (fig. 8) organized by FEMA, and later by the Forest Service, was one of the principal jobs of the Information Scientist. During late May and most of June, news conferences were held daily. During eruptions or other newsworthy events, additional news conferences were held as needed--sometimes several per day. When volcanic activity and citizen interest declined, weekend news conferences were cancelled; by late summer news conferences were held only once weekly. A typical news conference lasted about an hour and involved the Forest Service, FEMA, State of Washington, and other organizations, in addition to the USGS Information Scientist. Part of the USGS information came from a daily written summary of volcanic and seismic activity prepared by the Coordinator or Scientist-in-Charge and distributed at the news conference. The Information Scientist often also discussed new scientific discoveries, new experiments, new equipment, and geologic concepts. Occasionally field geologists, geophysicists, or hydrologists would attend and describe their activities and discoveries.

Figure 8. Typical news conference in late May, 1980, at the information center, Vancouver, Wash., in which Information Scientist M.H. Hait, Jr., is answering questions. Photograph by Walter Conner, FEMA.

After a news conference, the Information Scientist returned to the information center for the rest of the day and evening to answer telephone calls from news representatives; the pace was often frantic. Most telephone calls came from radio and television stations, news wire services, newspapers, and magazines. Most of those from radio stations were for taped telephone interviews. Occasionally technical questions came from concerned citizens, geologists, or professors. Most mail and telephone requests were for the latest information about the volcano; other requests were for background information or photographs. As did the Scientist-in-Charge, the Volcanic Hazards-Assessment Coordinator, and many others, Information Scientists gave many talks to town or county meetings, clubs, government agencies, schools, and other community organizations, and they taped radio and television question-and-answer shows. Rumors of new activity--often resulting only from noises or weather clouds near the volcano--had to be evaluated and responded to by the Information Scientist. When threats of flooding and other hydrologic concerns increased during the winter and spring of 1980-81, a USGS hydrologist assisted the Information Scientist.

News-media attention was focused on Vancouver, but much information was also issued by scientists and Public-Affairs Officers at other USGS centers. Telephone inquiries and requests for interviews sharply increased at other major USGS centers during each eruption. These offices also provided other news-media services, such as more than 40 news releases and photographic captions describing eruptions issued to news media across the nation.

PROBLEMS

Minor misunderstandings between the USGS spokesmen and news representatives led to published errors or statements out of context. For example, prior to the eruption of May 18, false rumors of lava flows moving down various flanks of the mountain were occasionally reported by so-called eyewitnesses. In late May and early June, minor inflation of the southern and

southwestern flanks of the volcano, indicated by tiltmeter, was misinterpreted by some reporters to mean that a bulge was forming similar to that on the northern flank that preceded the May 18 eruption. In early June a major news story arose from the theory that Earth tides trigger eruptions and from the coincidence of a high tide with the 13th--Friday of all days! No correlation was found between tides and eruptions at Mount St. Helens, and fortunately for science, the June 12 eruption missed that traditional day of superstition, though only by hours.

Controversy over access to the mountain proved a more difficult problem. The Forest Service and State of Washington sought to restrict access to Mount St. Helens in order to prevent death and injury by accidents or volcanic eruptions, to minimize danger in cluttered airspace, and to ensure rapid evacuation of people working in potentially hazardous areas. Reporters, however, wanted access to the mountain to get information and news stories and to interview scientists at work; citizens wanted access to summer homes and work places near the volcano and after May 18 to view the disaster area. Unrestricted access of all these people would have endangered lives and distracted scientists working long hours under demanding conditions. Yet some access by news media was needed to satisfy the public's need for information. Thus news pools were arranged, in which a limited number of reporters, photographers, and camera crews were escorted to the volcano by the Information Scientist or Public-Affairs Officer. News-media personnel in the pools paid for the cost of such trips; they shared their notes, tapes, and films with other news personnel when they returned from the mountain. The first pool, on April 7, consisted of a caravan of vehicles driven to the Spirit Lake and Timberline parking-lot area. After the eruption of May 18 destroyed most of the roads near the volcano, pools were difficult to arrange because of the increased danger and because helicopters were the only means of access. Restrictions were especially severe between May 18 and mid-June because of poor weather and uncertainty about eruption premonitors. Many news-media representatives found the pools unsatisfactory in any case, for they wanted their own personnel on the mountain. Newspaper and magazine reporters particularly disliked using pooled information; eventually they participated in lotteries for the few seats available on helicopters.

A difficult problem for the USGS was whether to report preliminary information based on sketchy field data or on instrumental data unconfirmed by direct observation. Spokesmen tried to verify field observations before releasing information, but bad weather or hazardous conditions often prevented confirmation. Consequently errors were made, as when a volcanic dome was mistakenly reported in the crater in late May. Several times, overinterpretation by scientists of data on volumes and emission rates of gas from the volcano caused premature speculation that the volcano might be ready to erupt again.

Delays in releasing stories also were a problem. Information on an earthquake and aftershock sequence at Mount Hood in July was held by USGS officials for a day or so while the data were analyzed and interpreted and other government officials notified. During this delay, some enterprising news reporters discovered part of the story before it was officially released. Such delays occasionally contributed to the reporting of "half stories." Spokesmen soon learned that "the 6-o'clock news goes on whether the USGS is ready or not."

The high volume of work, especially during an eruption, led to backlogs in returning phone calls, arranging interviews, and planning news conferences. Priorities had to be assigned, and news wire services, national television and radio networks, and news magazines, all of which reached large audiences, were usually given preference. Field geologists were sometimes pressed into service at such times. When an Information Scientist became exhausted by the hectic schedule, another scientist was temporarily rotated into the job.

When in the fall of 1980, the Information Office shortened its hours of operation to a normal working day, reporters made their evening inquiries to the seismological laboratory of the University of Washington in Seattle or to the Forest Service in Vancouver, which were still staffed 24 hours a day. At times these alternate sources contradicted information given out by the Information Scientist. Contradictory information breeds problems all its own, though the situation at Mount St. Helens never became as severe as that at Guadeloupe in 1976 (Fiske, 1984). To improve this problem at Mount St. Helens, all information groups were provided summaries of daily events before the Information Center closed.

CONCLUSIONS

The news story of Mount St. Helens held high public interest for most of 1980. For news representatives, especially in the Washington-Oregon area, the story was an unprecedented, phenomenal event. Cataclysmic and photogenic, the volcanic activity inevitably became one of the top 10 international news stories of 1980.

Problems between news media and government officials during the 1980 eruptions at Mount St. Helens were minor compared to those during the 1975-1977 eruptions at La Soufriére, island of Guadeloupe (Fiske, 1984). At La Soufriére, the pre-eruptive geologic data base was poor, the seriousness of the eruptive activity was difficult to decipher, and an apparent poor relationship between government officials, scientists, and news media heightened fears and led to a pointless evacuation of the citizens (Fiske, 1984). At Mount St. Helens, in contrast, the pre-eruptive volcanic history was relatively well known, scientific predictions about the meaning of imminent activity proved largely correct, and there was good organization and rapport between government officials, scientists, and news media.

One result of people's fascination with Mount St. Helens was that the USGS received more news coverage on its activities at the volcano than it had on any other event since its birth in 1879. Despite the hectic pace of scientific research, news coverage, and volcanic activity, there were no deaths, major injuries, or loss of property after May 18. Generally the news was covered rapidly and accurately--remarkable, perhaps, considering the technical nature of the story, the physical hazards involved, and the deadlines faced by news representatives. Much of the overall success resulted from close cooperation between employees of the USGS, Forest Service, Federal Emergency Management Agency, news media, and other organizations, each of which contributed different types of experience, skills, and perspectives to the news story. The relatively good safety record and the rapid responses by governnment officials to minimize casualties and to help disseminate news were possible partly because of the extensive volcanological research at Mount St.

Helens before and during 1980. In the same way, research on the volcano during and after 1980 will help prevent deaths by future explosive eruptions throughout the world.

ACKNOWLEDGMENTS

We gratefully acknowledge the logistical support, direction, and assistance by many employees of the Gifford Pinchot National Forest (U.S. Forest Service) and FEMA, the two main agencies that worked with the Geological Survey in supplying geologic information. Without their efforts the news story of Mount St. Helens could not have been told. Special thanks go to J. L. Unterwegner, P. R. Stencamp, G. J. Theisen, Thom Corcoran, Charlotte Martin, Barbara Johnson, Jerry Brown, Charles Caughlin, and the staff of the Emergency Coordination Center of the Forest Service and to Robert Stevens, P. S. Cogan, Joyce Routson, Kenneth Kohl, Joseph Sears, and Walter Connor of FEMA. Members of other agencies, including those of the State of Washington, also generously assisted.

Figure 9. Donald W. Peterson, first Scientist-in-Charge of the David A. Johnston Cascades Volcano Observatory, USGS, Vancouver, Wash., during dedication ceremonies on May 18, 1982. Photograph by Lyn Topinka.

Numerous USGS personnel assisted in the news story of Mount St. Helens. The USGS Coordinator at various times was R. L. Christiansen, D. R. Crandell, D. R. Mullineaux, and D. W. Peterson (fig. 9); Peterson later became the first Scientist-in-Charge of the David A. Johnston Cascades Volcano Observatory in Vancouver. The Volcanic Hazards-Assessment Coordinators included D. R. Crandell, D. R. Mullineaux, C. D. Miller, and C. G. Newhall. The Information Scientists during 1980 were, in chronologic order, M. H. Hait, Jr., P. D.

Rowley, J. M. Buchanan-Banks, R. P. Noble, M. J. Reed, S. L. Russell-Robinson, R. R. Mallis, and K. J. Murata and, after 1980, K. J. Murata, R. R. Mallis, S. L. Russell-Robinson, K. V. Cashman (fig. 10), and S. R. Brantley. D. R. Nichols, R. I. Tilling, R. L. Wesson, J. F. Devine, D. R. Finley, and E. G. King of the USGS saw the need for and helped the Scientist-in-Charge and the Volcanic Hazards-Assessment Coordinator select the individuals rotating on the job of Information Scientist. M. R. Hill (also of San Francisco State University) helped in disseminating news in Vancouver in May and June, 1980. We are deeply grateful to these persons for their help, as well as to the USGS team in Vancouver and in Seattle and to seismologists of the University of Washington for their constant support and their continual stream of data about volcanic activity. We especially thank D. R. Mullineaux, C. D. Miller, D. W. Peterson, D. R. Crandell, D. R. Nichols, D. R. Finley, R. L. Christiansen, R. P. Hoblitt, R. W. Decker, E. T. Endo, S. D. Malone, C. S. Weaver, Christina Boyko, J. C. Stephens, W. T. Kinoshita, E. G. King, J. F. Devine, C. F. Shearer, W. A. Duffield, J. D. Unger, C. M. Nelson, M. P. Doukas, J. G. Rosenbaum, C. G. Newhall, K. A. McGee, Larry Hubbard, Betty Patterson, Diana Mullineaux, Bobbie Myers, F. H. Forrester, D. B. Kelly, and A. M. Kaplan. Anita Rivenburgh, Cella Ferguson, and Brenda Hait provided calm secretarial assistance during especially frenzied periods. Dee Molenaar and Gerhard Wörner created drawings and paintings during May and early June that helped news representatives to visualize the volcanic activity. W. R. Hansen, D. R. Finley, C. D. Miller, C. A. Wallace, D. R. Nichols, D. W. Peterson, D. R. Mullineaux, R. B. Waitt, Henry Spall, D. M. Morton, J. M. Aaron, G. J. Theisen, M. A. McCall, J. A. Troll, and D. B. Kelly critically reviewed the manuscript. C. D. Miller, P. S. Cogan, Walter Conner, Lyn Topinka, T. R. Alpha, and T. J. Casadevall provided photographs.

Figure 10. Geologist Katharine V. Cashman en route by helicopter to Mount St. Helens during her tour as Information Scientist. Photograph by T. J. Casadevall.

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