UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

USGS Response Plan for Volcanic Hazards in the Long Valley Caldera - Mono Craters Area, California

Open-File Report 84-500

Office of Earthquakes, Volcanoes, and Engineering
Reston, Virginia
July 1984

TABLE OF CONTENTS

USGS RESPONSE PLAN FOR VOLCANIC HAZARDS IN THE LONG VALLEY CALDERA-MONO CRATERS AREA, CALIFORNIA

INTRODUCTION

This plan outlines the organizational structure, personnel responsibilities, and general operational procedures for U.S. Geological Survey response to increased geologic activity of the type that could lead to a volcanic eruption in the Long Valley Caldera-Mono Craters (LVC/MC) area, California. As the lead Federal agency for volcanic hazards assessment and notification, the USGS has three principal responsibilities:

(1) to conduct monitoring and other scientific investigations in order to assess the nature, timing, and likelihood of volcanic activity;

(2) to assess volcanic hazards associated with anticipated activity, including kinds of events, their effects, and areas at risk; and

(3) to provide timely and accurate information on volcanic hazards, and warnings of impending dangerous activity, to local, state, and Federal officials and the public.

The organizational structure for this plan is shown in figure 1. As explained below, the responsibilities and authority of some elements of this structure depend on the nature of USGS response to geologic activity in the LVC/MC area. During periods of routine activity, the role of the LVC/MC organization is largely to coordinate monitoring and hazard assessment through normal management channels. Under conditions of Event Response, the LVC/MC organization becomes directly responsible for all USGS activities concerning the response (figure 2).

ORGANIZATIONAL STRUCTURE

Chief, Office of Earthquakes, Volcanoes, and Engineering

The Chief, Office of Earthquakes, Volcanoes, and Engineering (OEVE) has overall responsibility under both routine and Event Response conditions for monitoring, hazards assessment, and all operations relating to volcanic and earthquake hazards in the LVC/MC area (figure 1). He is responsible for ensuring that accurate summaries of geologic, monitoring, and hazards information are prepared and transmitted as frequently as conditions require to the Chief Geologist, the Assistant Director for Engineering Geology, and the Director, as well as to the California Division of Mines and Geology and the California Office of Emergency Services. He also is responsible for ensuring that policies and instructions of the Chief Geologist and Director are transmitted to, and followed by, personnel under his direction. He is assisted, as necessary, by the Coordinator of the Volcanic Hazards Program.

CHIEF SCIENTIST, LVC/MC

During periods of routine activity, the Chief Scientist for LVC/MC acts as a coordinator and works through the appropriate line managers to coordinate monitoring, hazards assessment, and information dissemination for the LVC/MC area. He ensures that the USGS is in an appropriate state of readiness for a timely response at LVC/MC. He ensures that monitoring and hazards assessment are conducted efficiently, effectively, and thoroughly, and that USGS activities in the LVC/MC area are summarized in the form of monthly and other interim reports and distributed in a timely manner. He also ensures that the monitoring and hazards data are adequately analyzed and periodically reviewed. This review process should include periodic meetings of all monitoring and hazards assessment personnel, as well as meetings and

discussions with the Scientific Advisory Team, relevant USGS managers, and the three Team Leaders, as appropriate. The Chief Scientist also is responsible for ensuring that accurate and timely hazards assessments and supporting scientific information are issued to all concerned parties, including local, state, and Federal officials, and the public.

When increased activity at LVC/MC prompts the declaration of Event Response Conditions by the Chief of OEVE, the Chief Scientist initiates establishment of a field center and ensures that all relevant monitoring, hazards, and support personnel are rapidly mobilized and dispatched to that field center. Under these Event Response Conditions, the Chief Scientist has full authority to direct all USGS personnel engaged in the response, wherever physically or organizationally located, and to call upon the resources of all USGS units assigned to and necessary for monitoring, hazards assessment, and support activities (see General Operational Procedures, p. 6).

TEAM LEADERS

To assist the Chief Scientist are three Team Leaders: Monitoring Team Leader, Hazards Assessment Team Leader, and Support Team Leader. During routine activity, these Team Leaders act as coordinators for their respective functions and work through normal management channels while assisting the Chief Scientist to accomplish his goals. Under Event Response Conditions, however, these Team Leaders report directly to the Chief Scientist and, through him, have full authority to issue instructions to their respective team members, determine team strategy, and assign necessary personnel to specific tasks.

Monitoring Team Leader: The Monitoring Team Leader serves as a consultant and advisor to the Chief Scientist in determining monitoring requirements and in analyzing and interpreting monitoring results. During periods of routine

activity, the Monitoring Team Leader maintains an overview of all monitoring activities, in order to ensure that all monitoring networks are maintained and that measurements are carried out thoroughly and with adequate frequency. Under Event Response Conditions, the Monitoring Team Leader directs monitoring activities carried out at the LVC/MC area and ensures that the results of all monitoring activities are collected, integrated, analyzed, and made available promptly to the Chief Scientist and the Hazards Assessment Team Leader.

Hazards Assessment Team Leader: Under both routine conditions and Event Response Conditions, the Hazards Assessment Team Leader prepares hazard assessments based on monitoring and other scientific data. He ensures that these assessments are accurate, are based on thorough integration of the current monitoring data, and are prepared in a timely manner. He presents and explains these hazards assessments and their scientific basis to local, state, and Federal officials and to the public. Should the Chief Scientist be absent from the field center under Event Response Conditions, the Hazards Assessment Team Leader has full authority to act in his behalf.

Support Team Leader: Under routine conditions, the Support Team Leader is responsible for ensuring that the support that may be required under Event Response Conditions is maintained in an appropriate state of readiness. Under Event Response Conditions, the primary function of the Support Team Leader is to relieve, as much as possible, the Chief Scientist, the Monitoring Team Leader, the Hazards Assessment Team Leader, and their respective team members of the burdens associated with logistics, liaison with other agencies, and contact with public and press. The Support Team Leader ensures that all resources necessary for monitoring, hazards assessment, and information dissemination are available or are acquired and emplaced as quickly as

possible. Such resources include those relating to transportation, communications, procurement, clerical and administrative support, space, accommodations, and public relations. He acts as liaison between the Chief Scientist and the California Division of Mines and Geology, the California Office of Emergency Services, local, state, and Federal agencies, and other USGS divisions. He is responsible for the release of information to the public. The Support Team Leader also serves the Chief Scientist as a consultant and advisor, particularly concerning agency and interagency policy and regulations and public relations. The Assistant Chief Geologist, Western Region, normally functions as the Support Team Leader.

SCIENTIFIC ADVISORY TEAM:

This team, chosen by the Chief Scientist, in consultation with the Chief, OEVE, and other relevant managers, consists of several scientists with broad volcanological or geophysical knowledge, or with other special expertise or insight, who individually or collectively can develop an overview of the Long Valley activity and operations. This team is under the leadership of the Chief Scientist and provides him with background information and advice on the interpretation of monitoring, hazards assessment, and other scientific data, on the possible long- or short-term course of the activity, and on monitoring strategy. Although the team need not be formally assembled during periods of increased activity, if assembled it should not participate directly in monitoring, hazards assessment, or support activities so that the team members are free to provide a calm, objective analysis of the situation.

ASSISTANT CHIEF SCIENTIST

When the Chief Scientist is away from Menlo Park, he will be represented in Menlo Park by an Assistant Chief Scientist. During periods of routine activity, the Assistant Chief Scientist will act for the Chief Scientist in

all matters concerning the LVC/MC area. During periods of increased activity when the Chief Scientist is at the LVC/MC field center, the Assistant Chief Scientist will have full authority, through the Chief Scientist, to direct the monitoring and other activities at Menlo Park and the other permanent USGS centers.

GENERAL OPERATIONAL PROCEDURES

The following outlines the general operational procedures and activities for implementation of the USGS LVC/MC Response Plan. The transition from line management to Event Response Structure is diagramed on figure 2.

1. Early warning and call-down:

   Initial communication of any change in geologic conditions that might possibly increase the level of volcanic hazard will be by a telephone call-down. At the onset of any unusual activity, the seismologist on duty at Menlo Park or the person noting the change in activity will call the Chief Scientist (or the Assistant Chief Scientist if the Chief Scientist is absent from Menlo Park), who is responsible for the decision to activate the call-down procedure.

2. Declaration of Event Response Conditions:

   Upon evaluation of the data and consultation with the available USGS scientific and management personnel, the Chief Scientist may recommend that the Chief, OEVE, declare Event Response Conditions. Such a declaration will trigger the Response Plan and initiate the establishment of a field center. USGS, local, state, and Federal officials will be notified of this decision by reinitiation of the call-down procedure at appropriate levels.

3. Assignment of Event Response personnel:

Either in advance of or upon declaration of Event Response Conditions, the Chief, OEVE, or the Chief Scientist will make arrangements for the assignment of appropriate personnel and other resources from all USGS units. Once these resources are secured, the Chief Scientist has the full authority for assignment of LVC/MC Event Response personnel. Normally, his requests for personnel or equipment will be discussed with and relayed through the appropriate supervisor, who must make every effort to supply the resources requested. In the event that a supervisor is not available, the Chief Scientist may contact and assign individuals directly. Should a LVC/MC Event Response Situation occur simultaneously with heightened activity elsewhere, conflicting demands for personnel and resources will be resolved, if necessary, by the Chief, OEVE. Once assigned to a LVC/MC Event Response Team, all personnel and equipment fall under the authority of the Event Response Structure until released by the Chief Scientist or the Chief of OEVE.

4. Establishment of a field center:

One or more field centers will be established by the Chief Scientist on declaration of Event Response Conditions by the Chief, OEVE. Deployment of personnel and material to the field center will be on instructions of the Chief Scientist to project personnel, either directly or through appropriate managers. By prearrangement, the Mammoth Lakes Fire Station is the primary field center for USGS operations and communications. Should conditions be deemed too hazardous to establish or maintain a field center at Mammoth Lakes, a secondary field Center at Bridgeport will be activated. The field center will serve as (1) a communications center for USGS field operations, (2) a staging center for

all monitoring, scientific, hazards assessment, and support activities, and (3) an information center for local, state, and Federal officials. The field center will include at a minimum a radio base station, telephone and telefax communications, a seismograph, a computer terminal, and auxiliary power.

5. Field operations and communications:

Once Event Response Conditions have been established, each person or field party must contact the appropriate Team Leader prior to beginning field activities in the Long Valley region to (1) inform him/her of their field plans, where they will be staying, etc. and (2) receive last minute information on logistics and special arrangements. When operating under Event Response Conditions, radio contact is to be maintained with the field center at all times while in the field, and field personnel must be prepared to respond directly to requests and instructions from either the Team Leaders or the Chief Scientist concerning monitoring efforts, hazard assessment, data reporting, safety precautions, and other matters. In addition, one or more representatives from each field party must participate in any coordination or data evaluation meetings called by the Chief Scientist or the respective Team Leaders.

The short-term hazard assessment of an impending volcanic eruption will depend almost exclusively on the quality and timeliness of data generated by the various monitoring efforts and on the ability to review promptly all of the monitoring results as they are generated. Therefore, it is essential that the data from each monitoring activity be transmitted through the Monitoring Team Leader to the Chief Scientist and the Hazards Assessment Team Leader as quickly and accurately as possible.

While responding to heightened activity, the focus of all monitoring activities must be on the current situation and how it is changing. Everyone involved in monitoring efforts should bear in mind that their own personal safety, as well as that of their colleagues and the public, may depend on how quickly their data are processed, transmitted, and analyzed in conjunction with the data produced by their coworkers.

6. Change of field centers:

If increased volcanic activity makes it wise to abandon the Mammoth Lakes Fire Station as a field center, the secondary center will be in Bridgeport at the District Ranger Station, U.S. Forest Service, Toiyabe National Forest, about 50 miles north of Mammoth Lakes. The decision to change field centers is the responsibility of the Chief Scientist; time permitting, the Chief Scientist will consult with the Chief, OEVE. Specific instructions for change of centers will be issued by radio to all field parties at that time.

If possible, duplicate field center facilities will be established at Bridgeport prior to a change in field centers in order to avoid loss of communications and monitoring capabilities during the changeover.

7. Deactivation:

Deactivation of the USGS LVC/MC field center will be determined and announced by the Chief Scientist in consultation with the Chief, OEVE, and the three Team Leaders. Personnel are not to cease operating from the field center without first notifying their Team Leader of their intentions and receiving his permission.

Figure 1.--Structure for the USGS Response Plan for Volcanic Hazards in the Long Valley Caldera-Mono Craters area, California

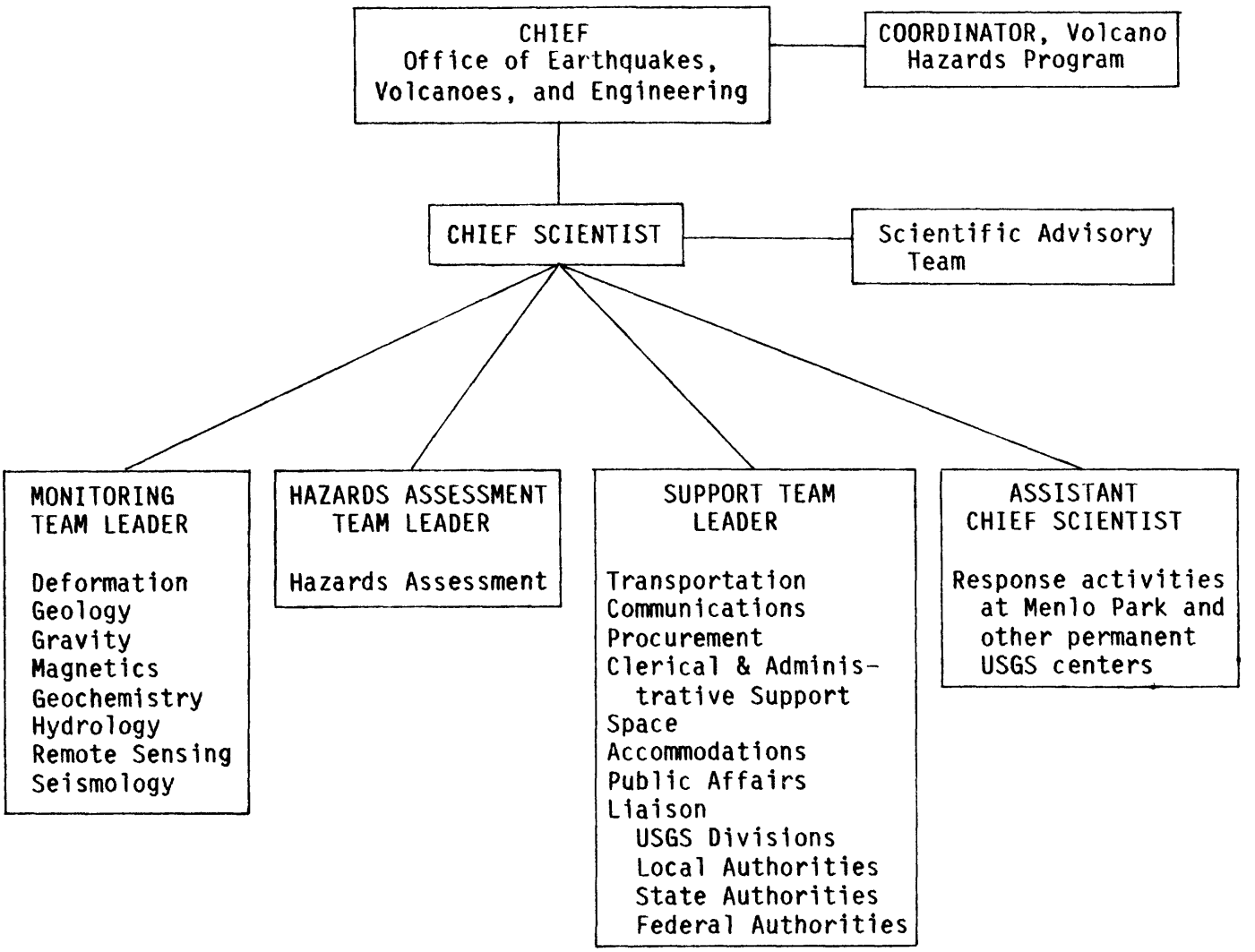
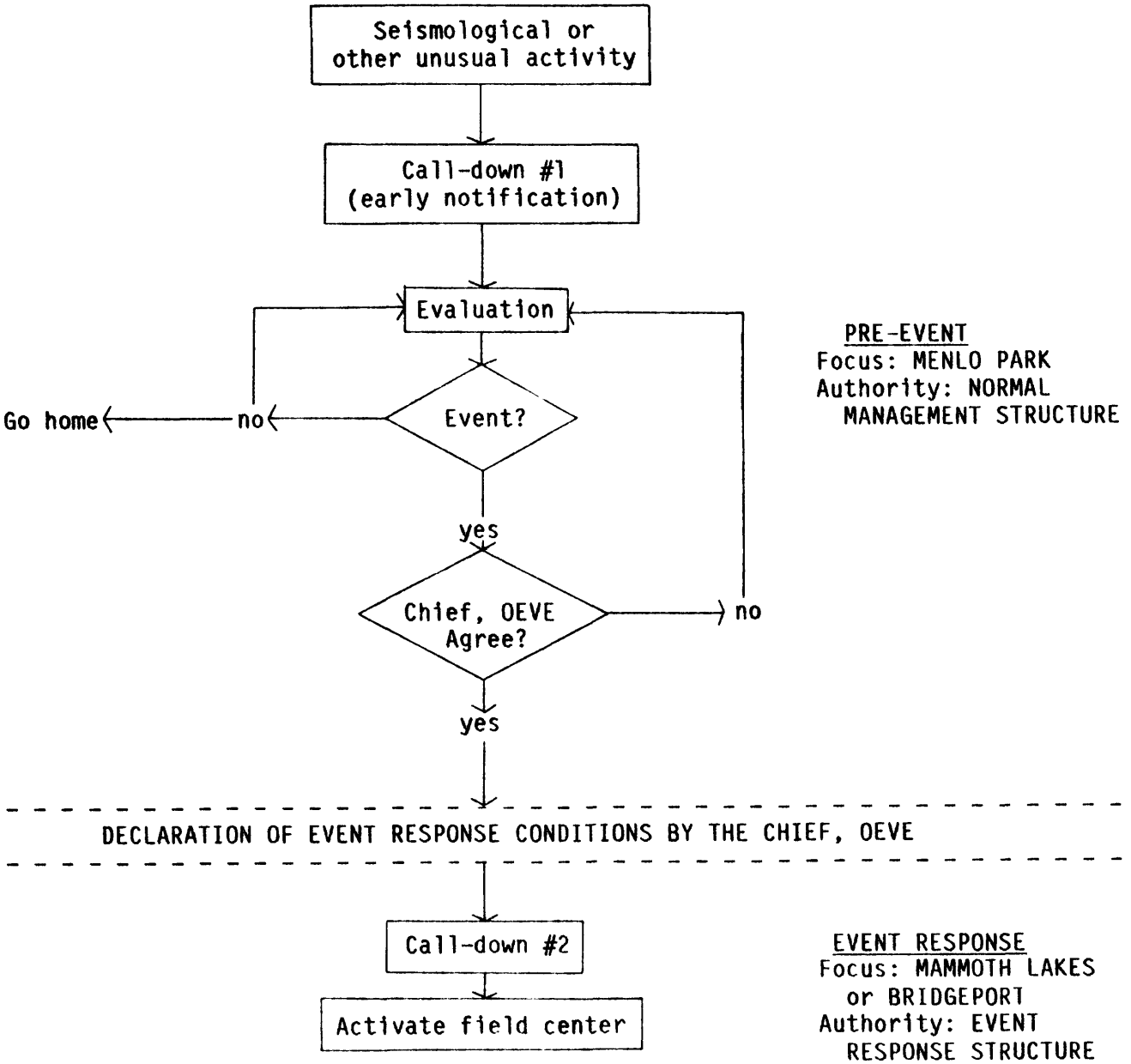


Figure 2.--Diagram of transition from normal management structure to LVC/MC Event Response Structure



APPENDIX

Cooperation - Geologic and Water Resources Divisions

In the case of an Event Response Condition, the Regional Hydrologist, Western Region, will arrange to have members of the Water Resources Division, along with the necessary equipment, assigned to the Event Response Team. Once assigned to the Event Response Team, they will be placed under the supervision of the Chief Scientist.

In a situation in which hydrology becomes a significant component of the Event Response, the Regional Hydrologist, Western Region, will arrange to have a high-level scientist assigned to the Chief Scientist's immediate staff. This individual will have the responsibility for advising the Chief Scientist on hydrologic aspects of the situation and the appropriate response. This individual will work with the Chief Scientist and assume supervision of the hydrologic group within the Event Response Team as delegated by the Chief Scientist.

In either situation, the final responsibility for the Survey's response will rest with the Chief Scientist.