

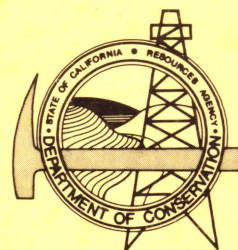
STATUS OF VOLCANIC PREDICTION AND EMERGENCY RESPONSE CAPABILITIES IN VOLCANIC HAZARD ZONES OF CALIFORNIA



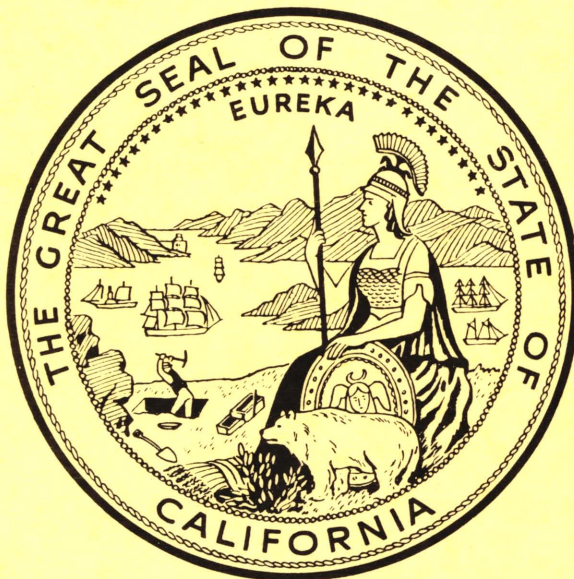
Mt. Lassen in eruption 1915

SPECIAL PUBLICATION 63

PROCEEDINGS OF A WORKSHOP
ON VOLCANIC HAZARDS IN CALIFORNIA,
DECEMBER 3—4, 1981, SACRAMENTO



CALIFORNIA DEPARTMENT OF CONSERVATION
DIVISION OF MINES AND GEOLOGY



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SPECIAL PUBLICATION 63

STATUS OF VOLCANIC PREDICTION
AND EMERGENCY RESPONSE CAPABILITIES
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Edited by
Roger C. Martin
and
James F. Davis
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California Department of Conservation
Division of Mines and Geology
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PREFACE

Until recently, most Californians were oblivious to volcanoes. Many had learned at an early age that the only "active" volcano (Lassen Peak) in the conterminous 48 States had last erupted in California during the years 1914-1917. But most perceived volcanoes simply as interesting cone-shaped mountains that erupt only in distant romantic places such as Hawaii, Central America, Indonesia, and Iceland. The disaster or hazard potential of volcanoes, portrayed by books and popular movies, was also associated with distant romantic places: Pompeii, 79 AD; Krakatoa (west of Java), 1883; and St. Pierre on Martinique, 1902.

In a sense, our awareness of volcanic activity as a hazard in California was similar to our concern for earthquake hazards in 1933, before the destructive Long Beach earthquake. Everyone knew that earthquake destruction was possible, but government and industry were not sufficiently concerned to prepare for it.

The cataclysmic eruption of Mount St. Helens, in 1980, changed our perceptions abruptly. The resulting losses of life and property damage and the spectacular devastation of a large region of forest and lakes impacted the economic and social outlook of Washington State and produced nationwide reaction and worldwide attention.

Recently, geologists working in California have begun to investigate the volcanic hazard potential of some volcanic areas of California. Lassen Peak has been dethroned from its position as the only active volcano in the conterminous USA, and some now regard it as not even the most likely candidate in California to erupt next. Geologic attention has been turning to the Long Valley caldera, Mono Lake, and Mount Shasta areas, which, while not as recently active as Lassen, nevertheless show evidence of a very active recent history, or of current earth movements of volcanic nature that warrant concern.

Coping with this newly recognized natural hazard is not an entirely unusual or alien problem for the State. A close similarity of the effects of volcanic and seismic hazards is obvious, and the California Division of Mines and Geology (DMG) and the California Office of Emergency Services (OES) have been among the world leaders in governmental groups attempting to safeguard the public through scientific studies and preparation training.

The Mount St. Helens experience brought home a realization of the massive information needs for California to adequately cope with a similar volcanic disaster. A DMG-OES task force, headed by the State Geologist, recognized the following information needs, and plans were made to attract the best qualified experts available to address these questions:

- o What portions of the state have the greatest probability of volcanic eruption? What information is required to establish priorities for the study of these potentially active volcanic areas?
- o What types of monitoring or observation should be employed in the most vulnerable portions of the state to insure public safety? Who should conduct the monitoring?
- o What types of volcanic eruptions are most likely in the active volcanic terrains?
- o Can we expect to employ techniques of volcanic eruption prediction established at Mount St. Helens in our emergency response planning efforts in California?
- o What types of earth science research are needed to improve our capability of dealing with volcanic eruptions in California?
- o What types of scientific information exchange will serve to expedite research and provide information for emergency planning?
- o What scope of planning will best assure the proper management of a volcanic eruption emergency in California?
- o What differences in emergency plans are necessary in the development of response activities to deal with the predictions of an volcanic eruption as compared with dealing with the eruption itself?
- o What responsibilities and roles are appropriate for federal, State, and local officials in emergency response to a volcanic eruption?
- o What are the federal, State, and local responsibilities and roles in emergency response to a prediction of a volcanic eruption?
- o Are federal "hazard notice, watch and warning" terminologies appropriate to volcanic hazards in California? How has the volcanic hazards watch status of the Mammoth Lakes area served public safety in the region?
- o What types of emergency communication between parties will be required during the response to a prediction? to an eruption?
- o What variations in emergency response plans are required by the possible variations in the types of eruptions which may be expected in specific regions of volcanic activity?
- o Are there any social science research results which should be but are not being applied to emergency response planning?
- o What type of social behavioral research can enhance our emergency responses to volcanic activity in California?

- o What insights from Mount St. Helens can be applied to managing public information and emergency response in the general volcanic circumstances in California?
- o What type of information clearinghouse is needed between the emergency response and the scientific communities in an emergency situation?
- o What types of conferences or workshops can extend our understanding of what still needs to be done in emergency planning and application of scientific insights to public safety?

This workshop was convened December 3 and 4, 1981, in Sacramento. Two hundred individuals representing a wide range of backgrounds, fields of interest, and areas of professional expertise participated in the workshop. We believe that the information exchange and interaction that occurred when these individuals came together generated significant insights pertinent to the above questions.

Perhaps it was the recent Mount St. Helens experience that kindled the lively awareness, interest, and concern of the workshop participants. Certainly during these two days an appreciation for the opportunity to communicate with widely differing professional groups was evident. Government leaders, planners, emergency response officials, and social scientists, as well as volcanologists, expressed their common need for preparation and group cooperation in dealing with a volcanic emergency.

On the first day, volcanic scientists ably summarized their knowledge of potential volcanic hazards zones in California, explained their recent accomplishments in studies to predict volcanic activity, and pin-pointed their deficiencies in this relatively young research field. On the second day, public leaders and human-response personnel related their problems in dealing with the public and the media, and emphasized their need for clear, consistent scientific advice during a volcanic emergency, especially the need for precise (deterministic) predictions of volcanic activity, to prevent loss of lives.

Perhaps the most pertinent of all expressions to arise in this workshop was that, for the low-probability, high-consequence hazards such as future volcanism in California, now is the time for scientists and public leaders to communicate on this issue so that modern planning and disaster preparations can be performed prior to a coming eruption, not during and afterward, as was essentially the case at Mount St. Helens.

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