

## **CONFRONTING VOLCANIC HAZARDS**

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On average worldwide, 50 to 60 volcanoes are in eruption each year—counting both continuing and new activity. During the past millennium, volcano-related hazards have killed more 300,000 people and have caused billions of dollars of economic loss. Most (all?) eruptions are preceded and accompanied by geophysical and (or) geochemical changes in the state of the volcano. With emergence of modern *volcanology* early in the 20<sup>th</sup> century, instruments and techniques have been developed to monitor such precursory changes as the volcano builds toward possible eruption. Even though geochemical monitoring is being increasingly applied, to date seismic and geodetic techniques still constitute the most diagnostic and robust *real-time* volcano-monitoring tools. Yet, despite continuing advances in instrumentation and the acquisition, processing, and interpretation of monitoring data, with rare exception (e.g., 1991 eruption of Mount Pinatubo, Philippines), the capability to routinely and reliably predict explosive eruptions still eludes volcanologists. Nonetheless, most volcanologists are confident that improved predictive capability can be achieved, if a volcano is fully monitored in *real time*. A serious challenge, however, is that there are far more active or potentially active volcanoes to monitor than there are scientists and funding available to conduct the needed volcano-monitoring and related hazards-mitigation studies. For the foreseeable future, the volcano still will call the shots, not the scientists and emergency managers.

### **Biography**

In 2004, **Dr. Tilling** retired after working 42 years with the USGS, mostly on studies of eruptive phenomena and their associated hazards. Interspersed with project research during his career, he also served in various management positions: Scientist-in-Charge of the Hawaiian Volcano Observatory (1975-1976); Chief of the Office of Geochemistry and Geophysics (1976-1981); and, most recently, as Chief Scientist of the Volcano Hazards Program (1996-1999). He received his BA in geology from Pomona College (1958) and a Ph.D. from Yale University (1963). Currently, Dr. Tilling is a Scientist Emeritus with the USGS and continuing volcano-hazards studies, including work at Mount Hood Volcano, Oregon.