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The Eruption Forecasting Information System (EFIS) database project

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The Eruption Forecasting Information System (EFIS) project is a new initiative of the U.S. Geological Survey-USAID Volcano Disaster Assistance Program (VDAP) with the goal of enhancing VDAP's ability to forecast the outcome of volcanic unrest.

The EFIS project seeks to:

(1) Move away from relying on the collective memory to probability estimation using databases
(2) Create databases useful for pattern recognition and for answering common VDAP questions; e.g. how commonly does unrest lead to eruption? how commonly do phreatic eruptions portend magmatic eruptions and what is the range of antecedence times?
(3) Create generic probabilistic event trees using global data for different volcano 'types'
(4) Create background, volcano-specific, probabilistic event trees for frequently active or particularly hazardous volcanoes in advance of a crisis
(5) Quantify and communicate uncertainty in probabilities

A major component of the project is the global EFIS relational database, which contains multiple modules designed to aid in the construction of probabilistic event trees and to answer common questions that arise during volcanic crises. The primary module contains chronologies of volcanic unrest, including the timing of phreatic eruptions, column heights, eruptive products, etc. and will be initially populated using chronicles of eruptive activity from Alaskan volcanic eruptions in the GeoDIVA database (Cameron et al. 2013). This database module allows us to query across other global databases such as the WOVOdat database of monitoring data and the Smithsonian Institution's Global Volcanism Program (GVP) database of eruptive histories and volcano information. The EFIS database is in the early stages of development and population; thus, this contribution also serves as a request for feedback from the community.