ANALYSIS OF VOLCANOS AS NUCLEAR WEAPON SIMULATORS

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The energy release from the violent volcanic eruption of Mt. St. Helens in 1980, that devastated 400 to 500 square kilometers of forest, was cited as equivalent to a 10 to 50 megaton nuclear explosion. The Defence Nuclear Agency (DNA) sponsored a research study to compare the eruption to a nuclear explosion to see if any phenomena or effects were analogous and thus might provide useful data for nuclear weapon effects studies. The phenomena and effects of air blast, ground shock, thermal, cratering and ejecta, and debris cloud and deposition were compared, with special emphasis on air blast. It is concluded that the widespread blast destruction from Mt. ST. Helens was not caused by an air shock wave, bur rather was the result of very dense clouds of volcanic ash driven by subsonic winds when the volcano vented laterally. Other close-in phenomena are also judged not analogous, making effects comparisons unlikely to be useful.

Recent volcanic activity in the U.S. has again stirred military interest. The Mt. St. Helens experience indicates that, with the possible exception of the dust cloud at relatively long distances, eruption data to be used in military analyses is of questionable utility and is very difficult to obtain from unpredictable occurrence such as a volcanic eruption.