

## Relationship between magnitude and frequency of volcanic eruptions

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Relationship between magnitude ( $M$ ) and frequency of volcanic eruption is assessed using a new database that lists more than 1000 eruptions in Japan over the one million-year period. It is determined that  $M5.0$  eruption occurs once a 100 years, and that  $M7.0$  eruption occurs once a 10 thousand years.  $M$  is defined by  $M = \log m - 7$ , where  $m$  is the mass of magma erupted in kg. Eruptions smaller than  $M3.5$  occur far fewer than expected by extrapolation of larger eruptions.  $M6.0$  eruption has occurred only two times during the last 10 thousand years, although this size of eruption is expected ten times by interpolation.