



Taupo Supervolcano: Post-Oruanui eruption record and current hazard estimate(s)

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Supervolcano eruptions are very low probability, but extremely high impact, geohazards. Taupo volcano hosted the youngest known supereruption (VEI8), the c. 1100 cu km Oruanui (Kawakawa) eruption at 25.4 ka BP. Eruptions from Taupo have had regional to global environmental effects, and a supereruption is acknowledged as one of the greatest risks to the sustainability of our modern civilization. However, unlike less extreme volcanic systems, there has been little quantification of the hazard from individual supervolcanoes. Since the Oruanui eruption, we have a record of 37 smaller (0.01 – 31 cu km), of which the largest was the Taupo eruption of AD232. Hence eruptions from a supervolcano can be of a size that can be mitigated against, and forecasting the magnitude, which may be correlated with repose, of future events is vital. Here we present a baseline (long-term) probability forecast for the time and magnitude of the next eruption, which will subsequently inform models for unrest and monitoring. We find that the history of the volcano has a strong modulating effect on the likelihood of eruption, and that the average magnitude appears to decline with increasing repose. The probability of an eruption of greater than 500 cu km within the next 500 years is estimated at c. 0.08.