Record completeness for individual volcanoes

Mark Bebbington

Volcanic Risk Solutions, Massey University, Palmerston North, New Zealand (m.bebbington@massey.ac.nz)

There has been considerable recent attention paid to completeness in global and regional (e.g. Japan) eruption data bases. This has taken the form of estimating dates at which the record is complete, either at a global or regional level, at a given VEI or magnitude. This has obvious utility when estimating hazard from very large eruptions, which may have effects 1000s of km from source. However, at a more local level, the question of interest is not so much the global, or the regional, completeness level, but the completeness of the record for an individual volcano. For example, forecast hazard is critically dependent on the size of the eruption, but it is impossible even to statistically describe the size distribution without knowing the completeness of the record. Current methods for eruption catalogue completeness using extreme value statistics rely on large samples for their validity, so a new approach is required for individual volcanoes, which may have only a handful of known eruptions. We will consider one possible such approach based using a Bayesian sequential algorithm assuming that the underlying process is Poissonian and that completeness at a lower VEI implies completeness at all higher VEIs. Results for individual volcanoes are compared with regional figures and, time-permitting, implications for a statistical model of VEI discussed.