Whilst volcanic systems are not 100% predictable, eruptions can show systematic precursors (Sparks, 2003). Because of this, forecasts of activity are usually based on knowledge of previous episodes of volcanic unrest at the volcano in question and at similar volcanoes (Venezky and Newhall, 2007; WOVOdat, 2010). Most forecasts at present are based on prior unrest at the specific volcano in question. However, often, there is little prior history. Using a small sample set of volcanoes we will test the premise that lessons from analogous volcanoes can also be used to interpret and forecast unrest at a specific restless volcano. We will ask whether use of data from several different volcanoes improves the accuracy of forecasts and reduces uncertainty in Bayesian event trees showing the probability of various progressions of unrest.

In the first test, we will compile pre-eruption seismicity and pre-eruption SO2 gas fluxes for two separate groups of volcanoes. The group A volcanoes are characterised by basaltic to andesitic chemistry and small to moderate eruptions every few years with no recent repose longer than about a decade. This group includes volcanoes such as: Arenal, Colima, Fuego, Etna. The second group, Group B are basaltic to dacitic in chemistry and produce small to large eruptions with repose periods generally longer than a decade. Group B includes Cotopaxi, Soufriere Hills, St Helens, Pinatubo and others. The question will be are forecasts that use information from analogues better than those based on activity at the specific volcano alone?