Volcano hazard characterization

- Stephen Sparks, Bristol
- Key questions:
  - Recurrence rates of different kinds of hazardous volcanic phenomena (e.g. explosive eruptions, lavas, pyroclastic flows, large landslides, lahars) of different magnitude and intensity?
  - What areas are affected by hazardous phenomena and how can the attendant risk be quantified?
  - Which areas are at high risk from future eruptions?
Volcanoes, cont.

• Data
  – Smithsonian Institution
  – Japanese Catalogue of active volcanoes
  – Volcanic Hazards Atlas of the Caribbean

• Methods
  – extreme value techniques to assess recurrence rates of large explosive eruptions
  – ensemble modelling with Monte Carlo techniques to estimate return periods and aperiodicity
  – Bayesian Belief Networks (BBN) for risk assessment
Volcanoes cont.

- Priority areas of work
  1) Recurrence rates of large magnitude volcanic eruptions
  2) Hazard databases: proof-of-concept study on volcanic landslides
  3) Intensity (magma eruption rate) data base
  4) Time gap database for large explosive eruptions
  5) Methods development
Volcanoes, cont.

• Actual and proposed collaborators
  – Dr Stuart Cole, Dr Willy Aspinall and Dr Gordon Woo
  – Smithsonian Institute
  – Regional partners
  – Reinsurance industry?

• Resource requirements
  – full-time postdoctoral researcher
  – full-time person to develop and manage the databases
  – funds for student help in systematic data mining
  – funds for GRIP meetings