

Impacts and dynamics of volcanically-generated jökulhlaups, Eyjafjallajökull, Iceland

Project aim: Funded by a NERC 'Urgency' award, this project aimed to improve understanding of volcanogenic jökulhlaup (glacier outburst flood) impacts and processes by examining the impact of the April 2010 jökulhlaups generated by the Eyjafjallajökull subglacial volcanic eruption.



We acquired post-jökulhlaup data for the Gígjökull proglacial area and the Markarfljót to compare with our March 2010 pre-flood TLS (Terrestrial Laser Scanned) topographic datasets. We therefore had an unprecedented and unique opportunity to i) accurately quantify the geomorphological and sedimentary characteristics of a series of jökulhlaups and ii) use these data to inform and validate our reconstructions of the hydrodynamic characteristics of a series of volcanogenic jökulhlaups capable of valley-scale geomorphological and sedimentary impact.



Specific objectives:

- (1) Production of a rapid, structured field inventory of the immediate geomorphic and sedimentary impact of volcanogenic jökulhlaups on fluvial systems surrounding Eyjafjallajökull.
- (2) Topographic survey and identification of flood wash limits and channel cross-sections to provide input data for reconstruction of flood peak discharge and hydraulics.
- (3) Quantification of geomorphic change using pre- and post-jökulhlaup TLS generated DEMs.

(4) Integrate river stage records and wash limit data from project partner Icelandic Meteorological Office with data collected under Specific Objective (2) to test the ability of a range of 2-D hydraulic models to predict the propagation of jökulhlaups of different rheologies.

(5) With reference to objectives 1-4 above, work with project partners and local stakeholders to improve our understanding of these recent jökulhlaups and apply this knowledge to management of future volcanically generated jökulhlaups.



Key output: DUNNING, S.A., LARGE, A.R.G., RUSSELL, A.J., ROBERTS, M.J., DULLER, R., WOODWARD, J., MÉRIAUX, A-S, TWEED, F.S., LIM, M. 2013. The role of multiple glacial outburst floods in proglacial landscape evolution: The 2010 Eyjafjallajökull eruption, Iceland. *Geology*, 41(10), 1123-1126. Read abstract [here](#)

Further information and outputs from this project can be found on our web site:

<http://www.jokulhlaup.org.uk>