Advances in the understanding of atmospheric impacts of volcanic ash emissions since Eyjafjallajokull 2010

A.J. DURANT*[1,2,3] AND A.J. PRATA[1]

[1]Norwegian Institute for Air Research, P.O. Box 100, NO-2027 Kjeller, Norway (*correspondence: adu@nilu.no)
[2]Centre for Atmospheric Science, Department of Chemistry, University of Cambridge, UK
[3]Geological and Mining Engineering and Sciences, Michigan Technological University, USA

Volcanic emissions contain a mixture of gases, and aerosol and silicate ash particles [1]. Volcanic aerosol injected high into the stratosphere may impact atmospheric chemical cycles, or interact with solar and terrestrial radiation and influence climate. Airborne ash and sulphate aerosol in the troposphere, in contrast, has shorter-lived atmospheric and climatic impact. The eruption of Eyjafjallajokull in April and May 2010 brought the atmospheric impacts of volcanic ash emissions to global attention through prolonged grounding of commercial aircraft and subsequent impact on the global economy. In response, the research community engaged across disciplines at an unprecidented scale to provide information, often in real-time, on eruption source parameters, airborne ash characteristics and fallout. One year on from the eruption, we investigate what new knowledge on the impacts of volcanic ash emissions has emerged.

Measurements of ash in the Eyjafjallajokull volcanic cloud from surface [2] and aircraft-mounted instruments [3], and satellite-based sensors combined with modelling [4] tracked the evolution of the ash emissions and provided sometimes contrasting indications of spatial variation in airborne ash concentration. Satellite measurements suggest highly heterogeneous structures with pockets of highly concentrated ash; in contrast the ground-based lidar network suggest low concentrations and highly dispersed ash layers, while airborne measurements suggest concentrations no greater than 1 mgm^{-3} in thin layers [3]. Ash aggregation, while not generally included in ash transport and dispersion models, played an important role in the sedimentation of fine ash generated by the eruption [5]. Finally, it is clear, post-analysis, that there is a need for assiduousness when applying standard atmospheric measurement techniques to the study of volcanic ash clouds.

[1] Durant *et al*. (2010) *Elements* **6**, 235-240. [2] Wiegner *et al*. (2011) *Phys. Chem. Earth*, In Press. [3] Schumann *et al*. (2011) *Atmos. Chem. Phys.* **11**(5), 2245-2279. [4] Stohl *et al*. (2011) *Atmos. Chem. Phys. Discuss*. **11**, 5541-5588. [5] Loughlin (2010) *www.bgs.ac.uk/research/highlights/IcelandAshParticles.html*

The geochemical characteristics of beach sediments of the Finike Gulf (Southwest Turkey)

E.S. DURMUS,.[1,2]*, M. ERGIN[1], Z. KARAKAS[1], K. SOZERI[1], B. ESER-DOGDU[1] AND Z. ONAL[1].

[1]Ankara University, Department of Geological Engineering, 06100, Tandoğan, Ankara
[2]Mahatma Gandi Caddesi No:33/1 GOP,Ankara
(*correspondence: elifseda_d@hotmail.com)

In the Finike Gulf (SW-Turkey), geochemical characteristics of modern beach sediments were studied to determine their possible economical potential with respect to marine placer deposits and related depositional, transportation and provenance factors. This study was supported by the the Scientific Research Projects Office of the Ankara University. The study comprised geomorphological field observations, sediment sampling and laboratory analysis (i.e., grain size, multielement composition, total heavy minerals). Within this context, in September 2009, large number of modern-surface sediment samples were collected from the foreshore and backshore sub-environments of the beaches of the Finike Gulf.

Sand with varying proportions is the dominant grain size in beach sediments, Element composition of sediment samples was mostly comparable with that of average earth's crustal rocks. However, relatively higher concentrations were measured for Ni (up to 451 ppm) and Cr (2548 ppm). These values can be related to the presence and wide occurrences of ophiolitic rocks (known as "Antalya Nappes") on the coastal hinterland [1]. The study is still going on.

[1] Ergin *et al*. (2007) *Marine Geology* **240**, 185–196.