

Jessica Ross

Research Overview and Budget Outline

The Dynamics of Sand Injectites and Associated Soft Sediment Deformation Structures

Supervisors:

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Currently my research is based in the Sorby Environmental Fluid Dynamics Laboratory at the University of Leeds with field-worked planned for County Clare in Ireland and Morecambe Bay in order to ground-truth experimental results on the genesis and morphology of sand injectites. Most of this work is covered by my research funding, along with additional funding secured from the departmental institute (ESSI) at the University of Leeds.

Much of my research is laboratory based, modelling fluidisation structures in the Sorby Environmental Fluid Dynamics laboratory and has thus far resulted in the acceptance of a manuscript; “An integrated model of extrusive sand injectites in cohesionless sediments”, for publication in *Sedimentology*. Validation of experimental results was originally planned for County Clare, Ireland to study the internal geometry and spatial relationships of fluidisation structures such as sand volcanoes and Morecambe Bay to investigate the relationship between liquefaction (quicksand) and fluidisation. However, in the course of reviewing literature during preparation of my manuscript, it became clear that a large proportion of research into fluidisation structures has been carried out on mudstone hosted sand injectites whereas systems where sand has been injected into sand have received relatively little attention. In order to fully validate my experimental results it is necessary to visit an area where sand has been fluidised and injected into sand, such as the Jurassic erg sands of Utah. Due to the variety of scales of sand injection in Utah (centimetre to decimetre scale), there is considerable scope for studying features identified in our experiments, such as clay-lined injection pipes and investigating the novel possibility of dynamic, migrating pipes creating zones of homogenous sediment. Although previously workers have described these remarkable features, they have done so with the view of discovering the trigger for fluidisation (Netoff, 2002; Huuse *et al.*, 2005) or describing the variety of morphologies (Netoff and Shroba, 2001). It is also hoped that my current laboratory work investigating the flow conditions (presence of turbulent or laminar flow at various stages of injection) within clastic pipes can be integrated into this fieldwork and results presented at IAS 2011.

As a solely NERC funded student I have limited access to funds to support my research, with money being split between laboratory and field costs. Fieldwork in Utah was not anticipated at the beginning of this project, so although addition funding was secured from NERC at the beginning of my studentship, it has already been earmarked for laboratory costs, field seasons in Ireland and Morecambe. In order to raise money for this unparalleled opportunity I have secured money from the departmental institute (ESSI) in the School of Earth and Environment and have submitted an application to IAS for a grant to help cover costs. My field assistant and I will be camping for 4 weeks in order to keep costs at a minimum and the highest expenditure is expected to be flights and vehicle hire (now covered by ESSI grant).

Budget: Flights from the UK to Salt Lake City / Las Vegas (closest airports to my field area) cost in the region of £600. Therefore I am applying to the Gill Harwood memorial fund for £500 to help cover the cost of getting to this exceptional area.

REFERENCES

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