Andrew Whitham CASP Fieldwork Award 2022-23 - Winner

Applicant: Valentin Zuchuat
Project title: Timing and dynamic of the flooding of the Sørkapp-Hornsund High during the Earliest Triassic
Award: £2,500

Scientific question and rationale: The End Permian Mass Extinction led to extreme climatic perturbations and a rapid transgression during the latest Permian and the Earliest Triassic (Induan) in Spistbergen. This transgression was followed by a regression recorded by the Vardebukta Formation. In this context, the poorly-documented transgression of the Sørkapp-Hornsund High during the Dienerian seems at odd with the regional basin dynamic at the time. An improved knowledge of this transgression could shed light on the role played by Greenland on the development of the Western Barents Sea during the Earliest Triassic.

Specific objectives and deliverables: 1) map and quantify the geometry/relief/processes associated with the genesis of the unconformity at the base of the Triassic on the Sørkapp-Hornsund High (SHH); 2) Detail logging, mapping, and architectural analysis of the Brevassfjellet conglomerate, the lowermost Triassic unit on the SHH, which will help understand the nature and the dynamic of the depositional environment of this unit; 3) compare and correlate these analyses with neighbouring sections, and placing them in regional context.

The results will be published in one-two scientific publications, and will be presented at international conferences.

Proposed work plan: Two weeks fieldwork around Lisbetdalen on the SHH, measuring sections on Savictoppen, Kovalevskajafjellet, Gavrilovfjellet, Liddalen, Lidfjellet, Sturvefjella, and Sergeevfjellet, building on the work conducted for my MSc thesis (Zuchuat, 2014), and during my PhD (Zuchuat et al., 2020). If time/weather allows it, three or four additional sections will be measured around Kistefjellet at Sørkapp. Time of fieldwork: July or August 2022. Fieldwork will also be coordinated with MSc-PhD students and other fellow ECS from other institutions (UNIS) in order to maximise the cost- and the field-efficiency, and safety-efficiency. Given the polar-bear conditions in the last summers, we will overnight on a boat.

The detailed stand-alone and primary sedimentological, architectural, and sequence stratigraphic analyses will be complemented by additional: 1) Sampling of tephra beds for U/Pb dating (will be sent to Lars Eivind Augland, University of Oslo); 2) Sampling of extrabasinal clasts in the Brevassfjellet conglomerate for provenance analysis (will be sent to Henrik Svensen, CEED, University of Oslo); 3) Sampling of the limestone bed at the top of the Brevassfjellet conglomerate for biostratigraphic analysis (Hans Arne Narkem, Natural History Museum, Oslo).

This work on the SHH, if sponsored by the Andrew Whitham CASP Fieldwork Award, is a standalone project, but it will serve as preliminary study for a bigger scale project looking at basin reconfiguration occurring during the Permian-Triassic transition in the High Arctic. This second, bigger and regional project will hopefully be sponsored by a Deutsche Forschungsgemeinschaft (DFG), and will involve collaborators from various institutions, including my home institution (RWTH-Aachen), the University of Hamburg, the University of Oslo, and the University Centre in Svalbard.

Proposed expenditure, including details of any other sources of funding:

Plane ticket Düsseldorf – Longyearbyen: 800 €; 2 nights in Longyearbyen: 200 €

Boat Longyearbyen – Hornsund and overnights (12 overnights): 1650 €

Food supply: 25 € per day, 14 days in the field: 350 €

Other source of funding: IAS ECS grant, DFG grant (both grants in prep.)