

Developing a Critical Zone Observatory for Geomorphology

Interim Report September 2020

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This project is designed to provide a focus for, particularly UK-based, geomorphologists to look at long-term landscape behaviour and detailed process studies in a range of environments. The idea is to identify an area that shows long-term landscape development where data can be gathered together to help clarify ideas on long-term landscape development and which provides a perspective on the geomorphology of the British Isles. With the tendency for 'process studies' and short term funding, long-term geomorphic perspectives are often lost. The idea is to develop, initially as a concept, but then to look for funding, for an 'observatory'. This is partly a virtual space for research but primarily is a physical location where active research and monitoring can be conducted.

The observatory idea is based around the concepts developed in the US for a 'Critical Zone Observatory'.

The Critical Zone is 'Earth's permeable near-surface layer... from the tops of the trees to the bottom of the groundwater' and 'A Critical Zone Observatory is an environmental laboratory, focused on the interconnected chemical, physical and biological processes shaping Earth's surface' (US NSF National program, 'Critical Zone Observatories')

Although such observatories are based upon geomorphological surfaces they do not, for the most part use geomorphologists as investigators. This project starts to develop a CZO based on geomorphology from sea level to mountain glacier and permafrost (in North Norway) bringing in investigators from many disciplines to look at past landscapes, present processes and mechanisms and future changes in a warming world. I call this a Critical Zone Observatory for Geomorphology (CZOG).

A paper for ESP&L is in progress for discussion in the geomorphological and CZO communities and with the hope that a long-term project could be established and for which funding would be sought. A preprint of this will be posted in the ResearchGate project site.

Progress

Currently I am working on this project alone but hope to take it to those who have expressed an interest in the project. I had intended to produce a progress poster for the BSG AGM this month. This will now be placed on-line in my ResearchGate project space. For the present this seem to be the best location for sharing ideas and information.

I had hoped to visit Norway this summer to talk with contacts and particularly look at how field logistics might be worked out. Unfortunately, travel restriction with Covid-19 have put this on hold until, all being well, next summer. I hope however, that I could circulate a draft rationale paper to several interested parties with the prospect online discussion in spring 2021.

This is going to be a project that takes some time to accomplish but I hope that once there is a sufficiently robust scientific plan and known support from individuals, then it could be taken forward to look for funding on a limited basis.

The original project was conceived as a means of bringing together geomorphologists, specifically those in the British Isles. For example, geomorphology in UK institutions no longer has a landscape perspective and areas such as weathering, soils and bio-geochemistry seem to be no longer studied, either at research or undergraduate programmes. This also applies to A-Level. In looking for links to current research in UK geomorphology and indeed physical geography I have become increasingly aware of a very specialism orientation, probably related to REF interests and grant acquisition, I am currently writing a paper on this for JGHE (which relates to the issues brought up by Ken Gregory and John Lewin). The Critical zone will be part of this as it provides some sort of central focus for geomorphologists and associated workers, as for example in Giardino and Houser's 'Principles and dynamics of the critical zone' (Elsevier, 2015) and the recent paper in Geomorphology by Aquilar et al, 2020, ('The expanding role of anthropogeomorphology in critical zone studies in the Anthropocene').

So far, £105 has been spent to aid BSG members to meet at a conference.

W. Brian Whalley. 7th September 2020