Manchester Geological Association

Some Aspects of the Quaternary

Saturday 8 December 2018

Speaker Abstracts

Underwater rivers

Prof Jeff Peakall, University of Leeds

The modern sea-floor has an abundance of giant channels that can be thousands of miles long, up to several miles wide, and hundreds of metres deep. These submarine channels are the feeder systems and arteries of submarine fans, the largest sedimentary deposits on Earth. Surprisingly these 'underwater rivers' are perhaps the most poorly known large-scale (up to thousands of miles long) geomorphic feature on the planet. Certainly the channels on Mars, Venus, and even Titan, are far more widely recognised!

These channels are fed by fast moving particulate-laden flows that are denser than the surrounding seawater and known as turbidity currents. Initiation of these flows can result in tsunami, and as they travel downslope they can damage sea-floor infrastructure and communications cables. Such submarine channel flows may also play a key role in the carbon cycle through transport and burial of organic material. In addition, the deposits of ancient submarine channels are of increasing importance as hydrocarbon reservoirs, particularly in the Gulf of Mexico and offshore West Africa.

Our early models and understanding of these submarine channels were based around comparison with their terrestrial cousins, rivers, yet work has highlighted just how dramatically different submarine channels and rivers really are. In particular, they show dramatic differences in their morphology and evolution, and their flow processes. Furthermore, unlike rivers they exhibit latitudinal variations in sinuosity and morphology. This presentation will provide an overview of these dramatic channels, as well as examining some of the latest developments that are driving our understanding of their morphology and behaviour.

Living with a shrinking Nile – 8000 years of environmental change in the Nile Valley of Northern Sudan

Jamie Woodward, Professor of Physical Geography, The University of Manchester

This talk will explore changes in the behaviour of the desert Nile over the last eight millennia or so. Jamie will illustrate the distinctive geography of the Nile in northern Sudan, presenting some of the latest interdisciplinary work seeking to understand the nature, timing and causes of Holocene fluvial system change and how societies fared alongside a volatile Nile over this period of profound climate and landscape change.

Fluvial History of Quaternary Environmental Change

David Bridgland, Professor Department of Geography, Durham University

The Quaternary has been characterized by a fluctuating environment, the result of oscillations between cold (glacial) climatic phases and warm (interglacial) phases, with the majority of the time spent under conditions between these two extremes. The severity of the cold episodes has increased in the latter part of the Quaternary, with a profound effect on river systems. Rivers have recorded the climatic fluctuations at the glacial–interglacial level particularly well, often forming terraces in synchrony with these cycles, particularly since the more severe glacials began. The evidence varies between systems, with the best information coming from those rivers that preserve fossils of various types within their depositional archive. Also part of the story is uplift, without which river terraces would not have formed, and early human occupation of the landscape, much of the evidence for which comes from fluvial sedimentary records.