Geography report

Jane Harrison

We were delighted to welcome back Sarah Woodroffe, Professor of Geography, at Durham University. Sarah previously spoke to us in 2021, when she talked about sea level change in Greenland. On this occasion her topic was “Searching for Eustasy in the Tropics”.

Eustacy is sea level change caused by factors such as the melting of polar ice caps or the heating of the oceans which lead to a change in volume. Isostacy, on the other hand, is movement of the land relative to the sea caused, for example, by crustal rebound that follows deglaciation. At a specific location the rise and fall of relative sea level can reflect either eustatic or isostatic movement or a combination of the two.

Information on sea level change comes from tide gauges and more recently from satellites. To reconstruct sea level change before such records existed, Sarah relies on examining sediments and microfossils. Understanding what happened in the past is important and may help to inform future decisions at a time when global sea level is rising. Since the 1990s average sea level rise has increased from around 2mm to over 3.5mm per year.

To establish whether eustatic change has occurred, a location far from ice sheets and glaciers and therefore the influence of isostatic change is a prerequisite. Sarah identified Queensland, in Australia, as a location for her doctorate on eustacy. In temperate latitudes salt marshes preserve a detailed record of sea level change and she hoped to transfer tested research methods to a subtropical location. Mangroves, with their complex root systems, are very sensitive to sea level change.

A small patch of mangrove left high and dry on an Australian beach

Sarah described some of the problems she encountered in collecting her data. The mangroves proved highly impenetrable as well as being extremely hot and humid. There were biting insects and worse still – crocodiles! She discovered that the marker species of foraminifera (microscopic, shelled organisms), found in intertidal zones, rapidly disintegrated in the

mangroves so were not found in core samples. Some flexing of the broad shallow continental shelf had also occurred leading to higher relative sea levels than expected. Her later research in the Seychelles resolved some, but not all, of these issues.

The audience were very envious of the locations Sarah had visited and suggested locations for her future research! Discussion ensued about the consequences of sea level rise. These ranged from the Thames Barrier being too low, changes to the Gulf Stream and the problems faced by island states such as The Maldives.

Next meeting: Thursday 18th December. The Witham. 2pm. By popular request – Gerald Blake "Geography of the Nativity" plus mulled wine and mince pies!