Geophysical Research Abstracts
Vol. 21, EGU2019-2959, 2019
EGU General Assembly 2019

The uplift of the Indo-Burman Ranges, Myanmar

Yani Najman (1), Edward Sobel (2), Ian Millar (3), Dan Stockli (4), Gwladys Govin (1), Frank Lisker (5), Eduardo Garzanti (6), Mara Limonta (6), Giovanni Vezzoli (6), Eugene Szymanski (7), and Alicia Kahn (7)

(1) Lancaster University, LEC, Lancaster, United Kingdom (y.najman@lancs.ac.uk), (2) Institut für Erd- und Umweltwissenschaften, Universität Potsdam, Karl-Liebknecht-Strasse 24-25, 14476, Potsdam-Golm, Germany, (3) NERC Isotope Geoscience Laboratory, BGS Keyworth, Nottingham, NG12 5GG, United Kingdom, (4) The University of Texas at Austin, Department of Geological Sciences, Jackson School of Geosciences, 1 University Station C1100, Austin, TX 78712, USA, (5) Fachbereich Geowissenschaften der Universitat Bremen, Postfach 330 28334 Bremen, Germany., (6) Laboratory for Provenance Studies, Department of Earth and Environmental Sciences, University of Milano-Bicocca, 20126 Milano, Italy, (7) Earth Science Department, Chevron Energy Technology Company, Houston, TX 77002, USA

The North-South trending Cenozoic Indo-Burman Ranges (IBR) flank the western margin of Myanmar. The IBR is generally considered to be an accretionary prism, with predominantly Paleogene sedimentary rocks on the eastern flank derived from the Western Myanmar Arc to the east, and Neogene rocks on the western flank considered to be off-scraped Bengal Fan material (Allen et al., JGSL, 2008). Timing of the exhumation of the IBR is poorly constrained (Maurin and Rangin, Tectonics, 2009; Najman et al, Basin Research, 2012), yet is important to understanding the tectonic evolution of the eastern Himalayan-Tibet region (e.g. Rangin et al, JAES, 2013).
We took a three pronged approach to determining IBR evolution:
(1) The IBR acts as a barrier between the Indian Ocean to the west and the Central Myanmar Basin (CMB) to the east, along which, today, the Irrawaddy River flows southward. Thus, the range must have been uplifted by the time that the Irrawaddy through-flowing drainage commenced. Our isotopic provenance study of the CMB rocks determined that the Irrawaddy drainage commenced in the late Oligocene to Oligo-Miocene boundary times (Zhang et al., in review; see presentation by P. Zhang et al. at EGU Meeting 2019).
(2) We constructed a low temperature thermochronological age elevation profile across the IBR, and documented a period of major exhumation in the latest Oligocene / Oligo-Miocene boundary, with a possible earlier event in the Mid Eocene.
(3) We compared the provenance of the sedimentary rocks east and west of the IBR. Prior to uplift of the IBR, the region of the CMB would have been open to the ocean to the west, and similar provenance signatures should be found in coeval rocks both sides of what is now the region of the IBR. After the IBR's uplift, a difference in provenance might be expected, with the rocks of the CMB reflecting derivation from the through-going Irrawaddy River, whilst the region west of the IBR was protected from that input by the risen barrier. We found that Eocene rocks were similar East and West of the Range, whilst Miocene rocks were different.
We conclude that a major period of uplift of the IBR occurred around the latest Oligocene to Oligo-Miocene boundary times. This may be related to changes in relative plate motion vectors (e.g. Li et al., JGR, 2018).