Summary of Gunnell paper

Article reference: Gunnell, Y., Gallagher, K., Carter, A., Widdowson, M. and Hurford, A.J., 2003. Denudation history of the continental margin of western peninsular India since the early Mesozoic–reconciling apatite fission-track data with geomorphology. Earth and Planetary Science Letters, 215(1-2), pp.187-201.

1 Overview

The aim of the study is to extract the denudation history of the passive margin in the Western peninsula of India. The post-rift denudation history is the controlling factor on the spatial and temporal extent of sediment loading offshore. Hence, understanding this will allow us to better understand passive margin models.

2 Location

2.1 Passive margins; overview

Mature passive margins represent an extensional environment in the transition from coastal to continental tectonic plates. They are no longer an active plate margin. Extension is driven by plate boundary forces creating a zone under tension. Passive margins are the end member of this rifting process, and are therefore a site of sediment deposition. Onshore denudation causes significant sediment unloading, and along with isostatic rebound this allows us to understand the morphology of the landscape.

2.2 Regional setting

The study location is peninsular India, which has been subjected to major rifting events since the early Jurassic (ca 180Ma; Sorey, 1995). It has since evolved into a mature passive margin, which is reflected in its current topography. Its morphological succession from the coast to the continental interior is as follows:

1. A low lying coastal plateau with short, seaward-flowing rivers (Konkan-Kanara lowlands)
2. A coast-parallel escarpment 0-70km inland (relief 0.6-2.2km). This is the continental-scale Western Ghats escarpment and is the focus of the study. It forms the vast majority of the main drainage divide of peninsular India.

3. An elevated inland plateau (Karnataka and Maharashtra uplands)

3 Methods

3.1 AFT explanation

3.2 Past research

subsection