# The Oligocene–Miocene transition in the tropical low latitudes

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The climate history of the late Oligocene to early Miocene interval has been relatively understudied, in part due to the limited recovery of high-quality marine sediment cores of this age. Despite this, the occurrence of both the late Oligocene warming event (LOWE, ~25 Ma; Pälike et al. 2006) and Mi-1 glaciation event (~23 Ma; Zachos et al. 2001) suggest this was a dynamic chapter in Earth's climate history. Further to this, it is suggested that a relatively weak version of the Indian monsoon system existed in the late Oligocene (~26 Ma; Reuter et al. 2013), and possibly as early as the late Eocene (Licht et al. 2014), but detailed sedimentological and geochemical evidence of this primitive monsoon system is limited.

We present high-resoution geochemical data from a sediment core recovered by the National Gas Hydrate Program (NGHP) of India from the eastern Arabian Sea, covering the late Oligocene to earliest Miocene interval. Data based on paired planktic foraminifera stable oxygen isotope and trace element analyses, benthic foraminifera stable isotopes, and bulk sediment elemental data from x-ray fluorescence (XRF) core scanning reveal new insights into the establishment of the Indian monsoon system across this critical interval. Data suggest that, coincident with the transient Mi-1 glaciation, there was a significant step-change in the oceanography and climatology at the site. We attribute this transition to the interplay between changing regional ocean circulation patterns and a change in behaviour of the primitive Indian monsoon system.

Licht et al. (2014). Nature, 513, p. 501–506.
Pälike et al. (2006). Science, 314, p. 1894–1898.
Reuter et al. (2013). Climate of the Past, 9, p. 2101–2115.
Zachos et al. (2001). Science, 292 (5515), p. 274–278.