Paleoenvironmental indications and cyclostratigraphic studies of sediments from tropical Lake Towuti obtained from downhole logging

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The Towuti Drilling Project

Lake Towuti is a tectonic lake on Sulawesi, Indonesia. It is located within the Indo Pacific Warm Pool, a region where relevant amounts of heat and moisture are produced for global atmospheric convection (De Deckker, 2016). During an ICDP drilling campaign in 2015, the Leibniz Institute for Applied Geophysics conducted geophysical downhole logging measurements.

Recorded parameters are: Spectral gamma ray (total gamma ray, U-, Th-, K-concentration), resistivity (deep & shallow), magnetic susceptibility, acoustic velocity, caliper, temperature, salinity and images of an acoustic televiewer.

Lithostratigraphy

Artifical lithologic logs were created for each lithological unit separately. Cluster analysis is a valuable tool for a rough estimation of stratigraphic layers.

Cyclostratigraphy

Cyclostratigraphic methods have the potential to improve our understanding of sedimentary processes and to enhance the accuracy of age-depth models, especially when dating material (e.g. tephra) is rare.

Age-depth model

The preliminary age-depth model improves using the sedimentation rate curve. More than 77% of the Lake Towutis history is covered using cyclostratigraphic analysis.

References

Russell et al. (2014). Glacial forcing of central Indonesian hydroclimate since 60,000 y BP. Proceedings of the National Academy of Sciences, 111(14), 5100-5105.

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