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Considering evolutionary aspects of the proxy value of benthic foraminifera – Progress and limitations

T. Kouwenhoven (1), M. Schweizer (2), S. Langezaal (1) and B. van der Zwaan (1,3)

(1) Utrecht University, Utrecht, The Netherlands

(2) ETHZ, Geologisches Institut, Zürich, Switzerland

(3) Radbout University, Nijmegen, The Netherlands

These days benthic foraminifera are among the commonly used organisms providing proxy records for paleo-environments of the sea floor. Historically described by paleontologists by detailed observation of the morphology of their tests, evolutionary lineages were constructed on the basis of common morphological traits and first occurrence datums, and paleoecological reconstructions were initially based on their occurrence in certain sedimentary environments. With growing interest of other disciplines for these organisms a lot more information has become available about habitats and life modes of these organisms, including the ways they incorporate geochemical elements in their calcite or aragonite tests. Nowadays paleoecological reconstructions lean heavily on knowledge of Recent foraminifera obtained by field sampling and lab experiments. Based on morphology and presumed evolutionary relationships the Recent findings are translated to fossil envoronments.

More recently molecular methods are being applied to foraminifera. Studies currently in progress aim at unravelling the genetic relationships between (groups of) foraminifera. Even more recent are the efforts to find particular functional genes.

In this presentation we will evaluate the progress and (present) limitations of such recent developments in foraminiferal research in their applicability to the geological past.