



Physical constraints on oxygen-18-based salinity reconstructions

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With the advent of independent temperature reconstructions e.g. from transfer functions based on foraminiferal assemblages, alkenone concentrations or Mg/Ca ratios, it has become common practice to estimate salinity variations from the oxygen-isotope ratio as preserved in foraminiferal carbonate. We argue that the propagation of the analytical errors as well as the uncertainties in the paleotemperature equation and the local relationship between salinity and the oxygen-isotope ratio of seawater must be carefully accounted for. Furthermore, we give examples of constraints from physical oceanography and climatology that allow us to assess the plausibility of the reconstructed salinity changes. Finally, we would like to discuss with the audience questions such as: How can the “oxygen-18 community” contribute to reduce the present uncertainties? Do we need an oxygen-18 database for the past?