

Diatom chemistry as a potential paleoproxy

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Diatoms are an important player in ocean chemistry and yet they are not yet a leading paleo-proxy. Developments in analytical techniques have made it possible to look at chemical characteristics of samples on nanometer scale and may thus improve our understanding of the nature of diatoms. This study utilizes the nano-SIMS facilities at Utrecht University to study variations in elemental ratios and isotopic ratios related to environmental changes. The aim of this research is to identify novel paleoproxies as well as improve existing proxies. Many existing diatom proxies such as the $\delta^{30}\text{Si}$ signal of opal, use bulk methods while the nano-SIMS can be used to investigate variability within frustules and between individuals of the same sample. Insight in intra-frustule and inter-species variability will significantly advance our mechanistic understanding of proxies based on diatoms, e.g. by identification of possible sources and distribution of the signal.