

Radiolarians and diatoms as sources of past climate and environmental information in the Southern Ocean

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Biosiliceous micro-organisms have been the subject of intense scrutiny in recent years to clarify their autoecology, biodiversity and genomics. These efforts have contributed to improve their application in paleoceanography and paleoclimate research. In the latter fields, pioneering work by Jim Hays in the late 1970s led to fundamental scientific advances, such as the discovery of orbital controls on the pacing of ice ages, as well as the first temperature and sea ice reconstruction of the North Atlantic during the Last Glacial Maximum.

The original tool (transfer functions, linking species abundances to oceanographic variables) has evolved substantially since then, with increasingly sophisticated and more accurate techniques being employed. Their application has also targeted a much wider variety of oceanographic regions, including all the main ocean basins, as well as their marginal seas. A substantial focus on the Southern Ocean has contributed to a shift in thinking from a North Atlantic-centric view of paleoceanographic change to one that takes into account the large role the Southern Ocean plays in the global climate system.

In my talk, I will briefly touch upon the historic development of the field, as well as present a series of case studies highlighting how diatoms and radiolarians are being used to reconstruct complex aspects of oceanographic and climatic change in the Southern Ocean during the Late Pleistocene.