Oxygen isotope evidence for Antarctic glaciation

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Abstract

Through ice-core studies

Introduction

One of the most prominent climatic changes in Earth's history occurred in the Cenozoic near to the Eocene-Oligocene transition, ca. 33.8 Ma. At this boundary the decrease in global temperatures lead to effects such as permanent ice-sheet formation on Antarctica. Through studying the $\delta^{18}O$ ratio in sedimented foraminifera from ice-core samples, this glaciation can be placed into a long history of glacial-interglacial shifts. Changes in the isotopic composition and temperature of seawater results in variations in the oxygen ratio (Emiliani 1955), thus the larger climate picture can be reconstructed.

The following should therefore be investigated:
Is there oxygen isotope evidence which demonstrates Antarctic glaciation?

Antarctic Drilling

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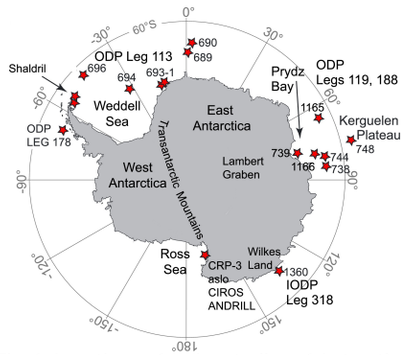

Fig. 1. Locations of major studies of Antarctic marine sediment (Carter et al. 2017) .

Antarctic Drilling

Conclusions

Through

This topic returns to the idea of how isotopes such as oxygen can be used to reconstruct paleotemperatures and climates, this in turn could provide potential evidence and support for hypotheses such as the "over-chill", "over-kill", or "over-ill" theories.

References

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Kennett, J. P. (1977). Cenozoic evolution of Antarctic glaciation, the circum-Antarctic Ocean, and their impact on global paleoceanography. *Journal of Geophysical Research*, *82*(27), 3843-3860.