Hydroclimate variability during the past millennium: a new record from West Basin Lake, Victoria

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HYDROCLIMATE VARIABILITY DURING THE PAST MILLENNIUM: A NEW RECORD FROM WEST BASIN LAKE, VICTORIA

HYDROCLIMATE VARIABILITY IN SOUTH-EASTERN AUSTRALIA

ABSTRACT

Our understanding of the long-term climate variability in Australia is limited by the number of high-resolution climate reconstructions. High-resolution palaeoenvironmental studies in Australia spanning more than a millennium are required to identify regional coherency among records and to recognise the relationships between climate and environmental conditions. This research project aims to investigate the nature of decadal-centennial scale climate and hydroclimate variability in south-eastern Australia. A record of hydrological change is established for the past millennium at West Basin Lake, a maar lake located in western Victoria. Palaeoclimate variability is inferred from sedimentary diatom analysis, and is used to reconstruct lake water salinity. These data are interpreted in conjunction with element concentration data. The record indicates that West Basin Lake underwent hydrological variability on a decadal-centennial timescale. The diatom record shows evidence of a more variable climate during 932-550 cal BP and less saline conditions from 500-100 cal BP. The record also identifies a multi-decadal period of increased salinity from 625-575 cal BP. This suggests a more variable climate during the past millennium than observed since European settlement. The record established from this study provides a regionally coherent palaeoclimate reconstruction of the last millennium for western Victoria, Australia.

KEYWORDS

Hydroclimate variability
Diatoms
Lake sediment
Palaeoclimatology
South-eastern Australia

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