

Late Holocene seasonal and
multicentennial hydroclimate
variability in the Coorong Lagoon,
South Australia: evidence from stable
isotopes and trace element profiles of
bivalve molluscs

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**LATE HOLOCENE SEASONAL AND MULTICENTENIAL HYDROCLIMATE
VARIABILITY IN THE COORONG LAGOON, SOUTH AUSTRALIA: EVIDENCE
FROM STABLE ISOTOPES AND TRACE ELEMENT PROFILES OF BIVALVE
MOLLUSCS**

RUNNING TITLE: PALAEOHYDROLOGY FROM MOLLUSC GEOCHEMISTRY

ABSTRACT

This study investigates the stable isotope and trace elemental geochemistry of the bivalve *Arthritica helmsi* with the aim to investigate its uses as a palaeoclimate archive. Firstly, stable isotopes and trace elements were measured on composite shell samples to create a long-term record of climate variability throughout the past 2500 years. Secondly, the seasonal variations within these multicentennial records was analysed through high-resolution trace elemental analyses on individual shells in addition to high replicate stable isotope analyses. These results show variation in the hydroclimate of the Southern Coorong Lagoon in response to freshwater flow and evaporation. A period of reduced moisture from 2200-1800 cal B.P and periods indicating more fresh conditions from 2500-2250 cal B.P and 1800-1300 cal B.P are in agreement with several other regional records suggesting a coherent regional climate signal. Increases in seasonality coincide with dry climates and indicate that summer climate variability is the main influence on Coorong palaeohydrology. *A. helmsi* exhibits significant potential as a palaeoclimate tracer, subject to further research into its contemporary biology and geochemistry.

KEYWORDS

Late Holocene

Coorong Lagoon

Arthritica helmsi

Climate Change

Oxygen isotopes

LA-ICP-MS

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