

RESILIENT FUTURES USING INTERDISCIPLINARY RESEARCH GUIDED BY LOCAL INDIGENOUS KNOWLEDGE

Katherine Aigner, Simon Haberle and Colin Pardoe

Australian National University, National Centre for Indigenous Studies, Canberra, Australia

Background: For thousands of years, the Murray–Darling River – one of the largest river systems in Australia – sustained large populations through periods of environmental change. Prior to European settlement, it was among the most densely populated regions on the continent. Today, the river system is highly regulated and ecologically vulnerable, with climate volatility, biodiversity loss, and water governance challenges threatening the resilience of wetland and floodplain ecosystems.

Objective: This paper examines long-term human–environment interactions in the Murray–Darling Basin to identify how interdisciplinary research, informed by Indigenous knowledge, can contribute to future sustainability and conservation.

Subjects and methods: This study integrates palaeoecology, archaeology, and anthropology. It draws on natural history collections, ecological datasets and the Indo-Pacific Palaeoecology Database (IPPD) to reconstruct environmental change. Archaeological analyses from sites such as Kow Swamp and Coobool Creek examine changes in body size and social organisation across climatic transitions. This data is combined with community-driven research in partnership with the Yorta Yorta Aboriginal Nation, incorporating First Nations ontologies through collaborative methodologies.

Results: Findings show significant environmental and social transformations since the late Glacial into the Holocene. Biodiversity shifts are evident in ecological datasets, while archaeological evidence indicates changes in human morphology and group relations. Integrating Indigenous knowledge with scientific data reveals relational practices that sustain ecosystems and highlights culturally grounded strategies for resilience.

Conclusions: Interdisciplinary, community-driven approaches are essential for understanding deep human–environment histories. By centring First Nations knowledge and ontologies alongside scientific data, the study demonstrates how co-produced knowledge can inform more effective and culturally appropriate conservation strategies. Such approaches are critical for supporting the restoration and long-term sustainability of the Murray–Darling River system.

Keywords: Indigenous knowledge; Wetlands; Ancient ancestors; Conservation.