

# Understanding the impacts of climate change through the lens of climate and ecological analogues

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**Abstract:** Spatial and temporal analogues offer powerful tools for translating climate projections into more tangible and actionable insights. **Spatial analogues** identify regions that currently experience climatic conditions similar to those projected for a site of interest, while **temporal analogues** reference recent extreme climate events as proxies for future scenarios. Although simplistic analogues—often limited to temperature and rainfall—have been used to communicate climate change impacts [1,2], recent studies have expanded their application to inform planning and management, including urban economic assessments [3] and agricultural yield forecasting [4].

These analogues can provide valuable lessons for building resilience and adaptive strategies. Knowledge, practices, and technologies from spatial and temporal analogue regions may be transferable, offering a foundation for future planning. However, this approach has limitations: drawing parallels between locations or time periods without accounting for underlying ecological, hydrological, or socio-environmental differences can lead to biased or misleading conclusions [5].

This presentation explores the utility of spatial and temporal analogues in assessing climate change impacts on key ecological assets across three Ramsar-listed wetlands in the Murray–Darling Basin. It highlights the need to move beyond temperature and rainfall, identifying additional climate variables critical for understanding ecological condition and state. A conceptual framework is proposed to guide the use of analogues, explicitly accounting for fundamental dissimilarities between spatially or temporally separated systems to improve the robustness of ecological impact assessments.

**Keywords:** climate change, Ramsar Wetland, Climate and ecological analogues

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