26th International Congress on Modelling and Simulation, Adelaide, SA, Australia, 30 Nov–4 Dec 2025
mssanz.org.au/modsim2025

Charting the future: A horizon scan for ecological forecasting research in Oceania

Alistair Hobday[a] and the OEFI community

[a]CSIRO Environment, Castray Esplanade, Hobart, Tasmania, 7000, Australia
Email: Alistair.hobday@csiro.au

Abstract: Ecological forecasting is emerging as a critical tool for anticipating environmental change and guiding decision-making across diverse ecosystems. In Oceania—a region marked by ecological richness, climatic variability, and socio-political diversity—the need for robust, actionable forecasts is urgent. This horizon scan synthesizes insights from the Oceania Ecological Forecasting Initiative (OEFI) and broader literature to identify priority research areas, knowledge gaps, and opportunities for advancing ecological forecasting in the region. Through a structured, community-driven process involving expert elicitation, thematic analysis, and scenario planning, we highlight key challenges and future directions.

Preliminary topics include improving forecast accuracy under climate extremes, integrating Indigenous knowledge systems, enhancing cyberinfrastructure for real-time data assimilation, and developing operational forecasting models for marine and terrestrial systems. End-user engagement is already emerging as a central theme, underscoring the need to co-design forecasts with stakeholders in conservation, agriculture, fisheries, and public health. We propose a regional roadmap that emphasizes interdisciplinary collaboration, capacity building, and policy alignment to ensure forecasts are not only scientifically rigorous but also socially relevant. By aligning research efforts with end-user needs and emerging environmental pressures, this horizon scan aims to catalyse a new era of ecological forecasting in Oceania—one that is anticipatory, inclusive, and impactful.

