



# CLLAMMecology Research Cluster

## Research in the Coorong, Lower Lakes and Murray Mouth

### NEED FOR RESEARCH

Located south-east of Adelaide in South Australia, the Coorong, Lower Lakes and Murray Mouth (CLLAMM) is one of Australia's largest estuaries and is one of six iconic sites identified by the Murray-Darling Basin Commission's *Living Murray* Initiative. The estuary is degraded and several of its iconic fish and bird species are threatened.

Through CSIRO's Collaboration Fund, the CLLAMMecology Research Cluster brings together scientists from a range of disciplines with the goal to develop a decision-support framework for assessing the effectiveness of interventions aimed at restoring the estuary. Research will link with existing initiatives for predicting the effect of changes in management of river flows and Lower Lakes barrage operations on water level and salinity. This is the most comprehensive ecological research program ever undertaken in the CLLAMM region and one of the largest of its kind in Australia.

CLLAMMecology will carry out a detailed study of the Coorong, the Lower Lakes and the Murray Mouth ecosystems to examine hydrology; aquatic, bird and fish ecology; and social sciences. It will produce ecosystem-level models that allow managers to assess potential consequences of decisions and evaluate water benefits, particularly for key species of migratory waders and estuarine fish.

Research will focus on the areas which are most likely to show ecological responses to changes in management actions, including the Murray Mouth region and the north and south lagoons of the Coorong. It aims to improve the habitat of migratory birds, increase the numbers of estuarine fish and help keep the Murray Mouth open.

Research outcomes will relate directly to policy and implementation initiatives such as:

- Significant Ecological Asset Management Plan; *Living Murray*
- Ramsar Plan; ecological character and wise use and
- Murray-Darling Basin Native Fish Strategy.



### COLLABORATION

Facilitated by the Water for a Healthy Country Flagship, CLLAMMecology research partners are CSIRO, the University of Adelaide, Flinders University, South Australian Research and Development Institute (SARDI) Aquatic Sciences, and the South Australian Department of Environment and Heritage.

Management agencies supporting the program include the SA Department of Water, Land and Biodiversity Conservation; the Murray-Darling Basin Commission; Land and Water Australia; and the Fisheries Research and Development Corporation.

The partnership will receive \$2.2 million from the CSIRO Collaboration Fund with partner contributions taking the total investment to \$5.3 million over three years.

As part of the \$305 million over seven years provided by the Australian Government to the National Research Flagships, \$97 million was specifically allocated to further enhance collaboration between CSIRO, Australian universities and other publicly funded research agencies.

The Flagship Collaboration Fund enables the skills of the wider Australian research community to be applied to the major national challenges targeted by CSIRO's Flagship Initiative.





## Research projects

The decision-support framework being developed by the CLLAMMecology Research Cluster will be delivered through four linked research projects.

### KEY SPECIES RESPONSES

This project will develop a series of models to document responses of key bird, plant and fish species to changes in aquatic environments likely under different water management regimes in the River Murray. For example, it will examine species that offer conservation (migratory waders), ecosystem (aquatic plant) or recreational (black bream and mullet) values. This research is led by the University of Adelaide.

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### PRODUCTIVITY AND TROPHO-DYNAMICS

This project will determine whether increased river flows lead directly to increased productivity by fuelling the food-chain (through the delivery of organic carbon from the catchment) or indirectly by increasing estuarine primary production through the increased delivery of limiting nutrients for phytoplankton and plant growth. It will contribute to descriptions of CLLAMM food-webs and will explore how energy is transferred across the ecosystem. This research is led by the University of Adelaide.

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### DYNAMIC HABITAT

This project will provide an assessment of changes in habitat distribution under different management scenarios. These distribution maps will be produced by linking water balance, hydro-geomorphic and ecological response models for key species produced under the Key Species Responses project.

This will allow the extent and quality of key habitats, such as the mudflats used by waders, to be predicted over time and under any flow scenario, enabling researchers and water managers to predict the impact of changes in water flow. This research is led by the South Australian Research and Development Institute (SARDI) Aquatic Sciences.

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### CLLAMM FUTURES

This project will evaluate the longer-term status of different parts of the CLLAMM region under different potential climate and management scenarios.

These scenarios will be developed in consultation with stakeholders. CLLAMM Futures will rely on the ecological information provided by the other projects.

The research is led by Flinders University.

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Some of the images supplied are courtesy of the Murray-Darling Basin Commission.