



## Lower Balonne Quarterly Snapshot – March 2025



### The data Flow

Working at a computer analysing data might not sound as exciting as getting out and working in the beautiful wetlands and waterways of the Lower Balonne, but data analysis is an essential component of understanding changes in the landscape to improve environmental water outcomes.

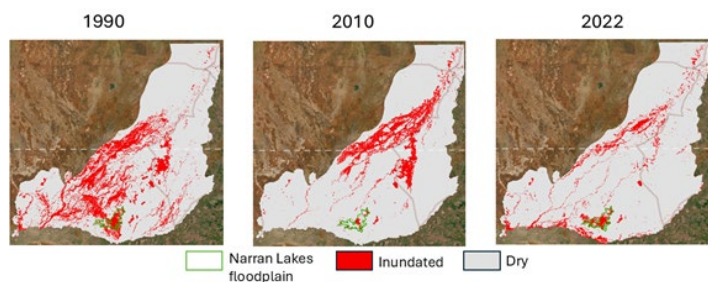
Andres Sutton, the newly appointed Remote Sensing Analyst for the UNSW CES Flow-MER team, has been hard at work compiling, processing and analysing Sentinel-2 and Landsat satellite data (see right) of the Lower Balonne catchment.

The data processed includes Sentinel-2 inundation maps and annual inundation dynamic maps (inundation start and duration) over seven years (2017-2024).

Sentinel-2 surface water extent in waterbird survey sites in Narran Lakes was studied at two scales: waterbird breeding site and wider landscape scale (including all survey sites).

Preliminary analysis of historical Landsat satellite inundation mapping revealed extensive changes in the inundation patterns of the Lower Balonne catchment in the past 35 years (pictured below).

Next, the team will analyse inundation data collected by the UNSW Flow-MER team over the last several months and study drivers (eg. land use changes, environmental flows, etc) of long-term trends. Understanding the causes of long-term changes will allow the team to predict future changes and better inform environmental water decision-making.



### Going to the heavens to protect the Earth



*The Landsat 9 satellite in orbit over Earth (Image: NASA).*

The UNSW Flow-MER team are utilising data from two Earth observation satellite programs - Sentinel-2 and Landsat - that monitor changes in the Earth's land surface conditions. The programs provide a data archive that assists people across the globe in making informed decisions about Earth's natural resources and the environment.

Developed and operated by the European Space Agency, Sentinel-2 consists of twin satellites that constantly orbit Earth, and the Landsat program, which is jointly managed by NASA and the U.S. Geological Survey (USGS), has a series of Earth-observing satellites.

The programs offer complimentary benefits. Running since 1972, the Landsat program provides the longest continuous record of Earth's land surfaces, while Sentinel-2 offers more frequent revisits (it takes a complete picture of the planet every five days) and additional spectral bands.

Both programs offer their images and data online and free of charge via:

- Sentinel-2 - [browser.dataspace.copernicus.eu](https://browser.dataspace.copernicus.eu)
- Landsat - [earthexplorer.usgs.gov](https://earthexplorer.usgs.gov)

The Flow-MER Program team acknowledges the Aboriginal communities of the Murray–Darling Basin and pays respect to Elders past and present. We acknowledge Aboriginal People as the Traditional Owners of the land, water and sky Country across the Basin and value the expertise, wisdom and enduring connections that have informed their care for Country over millennia. We recognise the intrinsic connection of Aboriginal People to Country, and we value the enduring cultural, social, environmental, spiritual, and economic connection to the rivers, wetlands, and floodplains of the Basin. Artist: Rebecca Salcole





## Waterbirds

**The fourth and final 2024-2025 Lower Balonne Flow-MER waterbird surveys were completed in February 2025. Nine of the 10 sites surveyed in the Narran Lake Nature Reserve were still wet. Only Salt Lake, a rainfed site, was dry. Eight sites exceeded 75 per cent inundation of the survey area.**

The widespread inundation supported new vegetation growth and abundant waterbird activity, with 43 species recorded across the survey sites.

The waterbirds recorded included three species listed on the NSW Government's threatened species list:

- a pair of black-necked storks nesting (*Ephippiorhynchus asiaticus*) – Endangered
- a pair of blue-billed ducks (*Oxyura australis*) – Vulnerable
- 18 freckled ducks (*Stictonetta naevosa*) – Vulnerable

The survey was conducted by the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) and supported by the NSW National Parks and Wildlife Service (NPWS).

Two members of the Dharriwaa Elders Group River Rangers also attended a morning survey, observing and getting to know the team.

There were hundreds (200 to over 500) of grey teal (*Anas gracilis*), Eurasian coot (*Fulica atra*), Australian pelicans (*Pelecanus conspicillatus*), great cormorants (*Phalacrocorax carbo*) and pied cormorants (*Phalacrocorax varius*) seen in the survey sites. Other species, where flocks of around 100 birds were observed, included pink-eared ducks (*Malacorhynchus membranaceus*), eastern great egrets (*Ardea modesta*), Australasian darters (*Anhinga novaehollandiae*), spoonbills and herons.

Darters and pied cormorants were also observed sitting on nests and with chicks, and little egrets (*Egretta garzetta*) were observed with breeding plumage.

The data from the completed Flow-MER survey trips, together with existing NPWS ground survey data, will allow our researchers to study changes in species composition at each site in relation to the season, water use, weather conditions and water in the landscape to inform Commonwealth environmental water decision-making.



*A black-necked stork captured in flight during the survey (Image: Pat Johnston, Bullarah Fauna Pictures).*

### Forty-three waterbird species and a random Rakali...

A surprising observation during the February waterbird survey was the observation of a Rakali (*Hydromys chrysogaster*).

Previously known as the Australian water rat, the name was phased out in the 1990s to distinguish it from the introduced rat species.

It was replaced with Rakali, from the language of the Ngarrindjeri people of the Lower Murray River and Coorong region of South Australia. Its name in the local Lower Balonne Gamilaraay language is gumaay.

This sighting was extremely rare as the animal requires habitats with year-round water. In contrast, Narran Lakes (Dharriwaa) is an ephemeral (or seasonal) wetland that is frequently dry.

The first and last official recorded sighting of a Rakali in the Narran Lakes Nature Reserve was in 1998.



*An image of a Rakali near Wallaroi Creek south of Condobolin, NSW (Image: Warren Chad).*

## More information

Visit [www.flow-mer.org.au](http://www.flow-mer.org.au) or contact the UNSW's Flow-MER Communications Officer, Jane Howard on [jane.howard@unsw.edu.au](mailto:jane.howard@unsw.edu.au)



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