Lake Macquarie

Overall water quality and ecological health in Wyee, Chain Valley and Crangan Bays have, for the seventh consecutive year, all remained Excellent. Chain Valley and Crangan Bays have relatively deep waters and small forested catchments with no major tributaries; these factors contribute to the good water quality and sea grass distributions in these bays. Wyee Bay does have a major tributary and receives 4000 megalitres per day of cooling water from Vales Point. This saw a higher average water temperature in this bay compared to those adjacent, but water clarity and algal abundance were Excellent on all but one sampling day where the algal abundance did exceed the trigger point. Sea grass distributions increased in Chain Valley and Crangan Bays with Crangan Bay graded Excellent, and Chain Valley improving to a Good grading. The exotic species Caulerpa taxifolia was observed for the first time in Crangan Bay; this is considered a marine pest species as it can displace native species and reduce habitat complexity.

Pretty Beach

Mooney Mooney

Lake Munmorah

Tuggerah Lakes Estuary

Overall water quality in most of Tuggerah Lake, Budgewoi Lake and Wallarah Creek declined in 2023-24 to Fair or Poor condition. Water quality was stable at Good for Chittaway Bay and Lake Munmorah, remained Fair in Ourimbah Creek and Wyong River and dropped to Good at The Entrance. The decline in water quality was largely driven by moderate to high levels of algal abundance throughout the system with over half of the sites receiving a Poor or Very Poor grading for algal abundance. The nearshore sites of Tumbi Umbi at the south end of Tuggerah Lake and Lake Haven in Budgewoi also had Very Poor water clarity.

While total rainfall over the year was close to average, monthly rainfall in November, April and May was up to three times the average. In these months, 4 large rain events occurred each recording between 100 and 200mm of rain in a 48-hour period. These rain events deliver high nutrient and sediment loads from the catchment to the estuary providing nutrients to fuel algal growth and a decrease in water clarity due to the suspended sediments. In the shallow waters of Tuggerah Lakes, these sediment and nutrient loads can easily be resuspended by wind and wave action resulting in an extended negative impact on water quality. In contrast, Lake Munmorah, where water quality remained stable, does not have many tributaries delivering catchment nutrient or sediment pollutants.

Despite water quality decreasing, seagrass depth range increased at all sites except Lake Munmorah, and were near the maximum recorded over the last 10 years. There was no consistent driver for this, but lake water level was quite stable over the peak seagrass growing period resulting in less turbid waters. This may have been a factor in the increased seagrass range recorded. The Excellent grading for sea grass depth range at The Entrance was the driver for The Entrance being graded as Excellent for overall ecological health.

Tuggerah Lake

Terrigal Lagoon

Wamberal Lagoon

Hawkesbury – Nepean (including Brisbane Water)

Overall water quality in the lower Hawkesbury River has improved to Excellent at Patonga Creek and Good at Mangrove Creek, both results were driven largely by a decrease in algal abundance in these creeks. Mooney Mooney and Mullet Creeks were graded as Fair, this was a drop in grade for Mullet Creek and a stable result for Mooney Mooney Creek. Water clarity remained stable at all sites except for a slight decrease observed in Mooney Mooney Creek.

Overall water quality and ecological health has remained Excellent in the Brisbane Water basin as has the water quality in Cockle and Woy Woy Bays. Kincumber Creek has remained Good despite a drop in water clarity to Fair. Erina and Narara creeks have both decreased in water quality to a Fair grading from Good last year. Both sites had an increase in algal abundance and Narara Creek also a decrease in water clarity. Higher than average rainfall fell in November 2023 and April 2024, and this corresponds with the higher algal abundance observed in these creeks. Both creeks have highly developed catchments with light industry, a golf course and significant urban development. Surface runoff from these areas is likely to be a major source of nutrients leading to increased algal abundance. Booker Bay also saw an increase in algal abundance and a drop in overall water quality from Excellent to Good.

Seagrass growth remained Excellent in the basin, Good in the Woy Woy creek area and Fair in Kincumber and Erina Creeks.

Coastal Lagoons

The water quality results were variable amongst the coastal lagoons this year, with Cockrone Lagoon improving to Excellent from Good last year while Terrigal Lagoon remained stable at Fair. Wamberal Lagoon's overall grade dropped from Good to Poor for overall water quality. Water clarity in the north arm of Wamberal lagoon was Very Poor and was the driver of the overall lower grade. This section of the lagoon was quite shallow for much of the year and as a north-south orientated lagoon, is prone to the nor-easterly winds. These conditions result in resuspension of sediment, decreased water clarity and a drop in water quality.

Avoca lagoon was again graded as Poor with water clarity stable at Poor and algal abundance at Fair. The Poor grades of this lagoon appear to be driven by the Very Poor water quality of the south arm which was graded Very Poor for water clarity and Poor for algal abundance. Contrasting this was the Good grade for water clarity in the central channel and Fair in the north arm and Fair grades for algal abundance in both sections. Like Wamberal, the south arm of Avoca is very shallow making it susceptible to resuspension of sediment. It also receives significant nutrient and sediment input from surrounding catchment runoff. Passage of these catchment pollutants to the outer body of water is limited by the restricted entrance to the southern arm created by the bridge and road structure.

A **Excellent** The indicators meet all benchmarks for morethan most of the year. Equal to the best 20% of scores in NSW.

B **Good** The indicators meet all benchmarks for most of the year. Equal to the next 30% of scores in NSW.

C **Fair** The indicators meet some benchmarks for part of the year. Equal to the middle 30% of scores in NSW.

D **Poor** The indicators met few benchmarks for part of the year. Equal to the next 15% of scores in NSW.

F **Very Poor** The indicators never meet benchmarks. Equal to the worst 5% of scores in NSW.

Seagrass grade: indicates depth of sea grass and if growth is expanding or contracting

Very Good Good Fair Poor Very Poor