



MIDCOAST
council

WATERWAY AND CATCHMENT REPORT CARD

2020

Reporting on data
November 2019 to March 2020



This project is funded by MidCoast Council's Environmental Rate and supported by the New South Wales Government through its Coast and Estuary Program and Department of Planning, Industry and Environment.



MANNING RIVER ESTUARY

The condition of the Manning River Estuary dropped by one grade in the Upper Manning and Dawson River, but overall has maintained good ecological condition. The Upper Manning and Dawson River Estuaries were in fair condition while good results were recorded in the Mid and Lower Manning Estuaries and Farquhar Inlet.

Apart from the Lower Manning Estuary, algal levels continued to be much higher than desired; this was particularly noticeable in the Dawson River and Upper Manning Estuaries. These results show there is a need for ongoing improvements in nutrient and sediment management from land use activities within the Manning Catchment.

The depth range where seagrass is able to grow in the Lower Manning Estuary decreased to fair, the same level as 2017 and 2018. There was a slight increase in the Mid Manning Estuary, but results are still fair. Seagrass has not regrown in the Upper Manning Estuary.

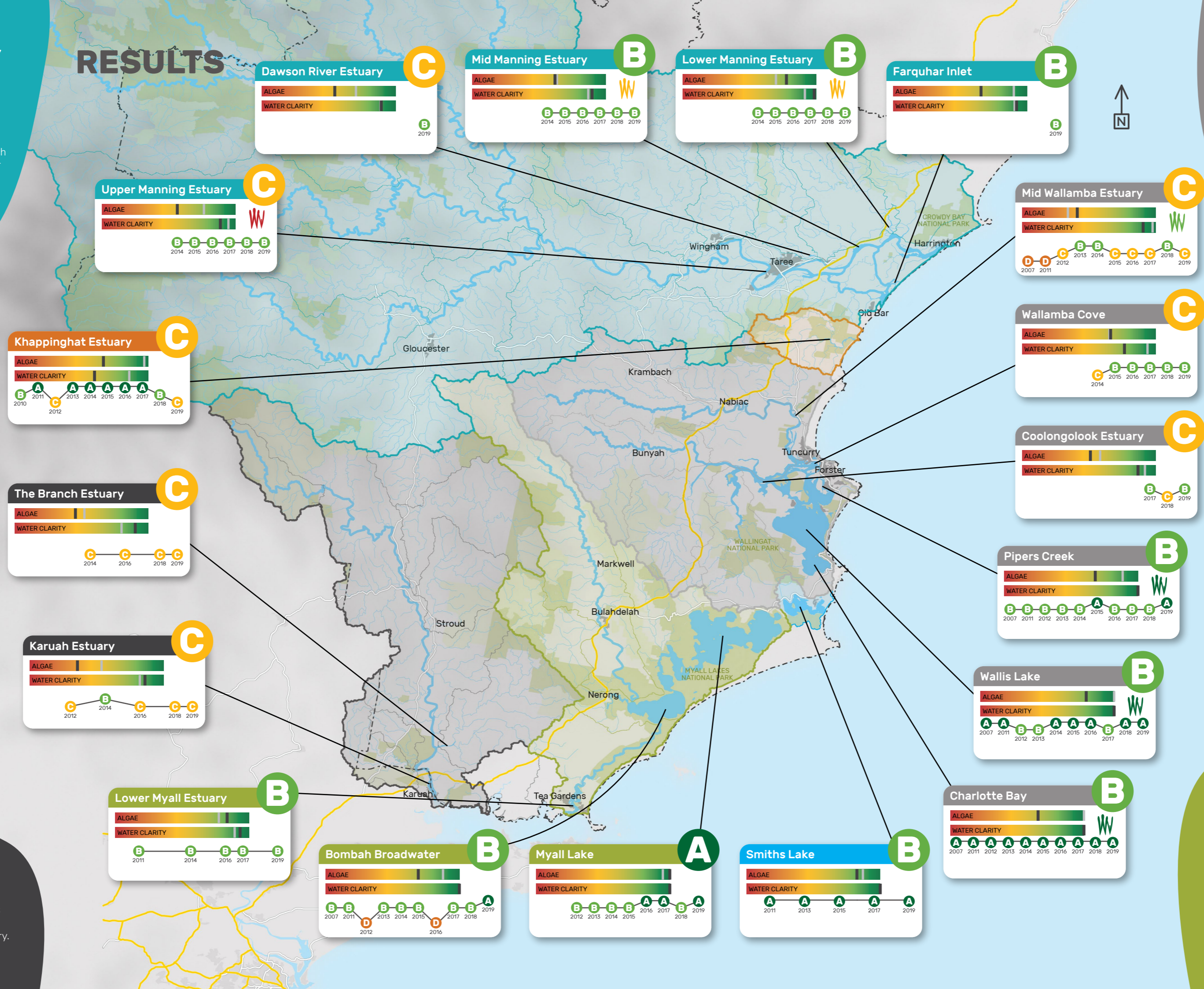
KHAPPINGHAT ESTUARY

The Khappinghat Estuary is located in Saltwater National Park so is expected to be in excellent ecological condition. However, last summer moderate algal growth and poorer than expected water clarity resulted in a fair grade. The sampling period was one of the driest on record followed by very heavy rain, the quality of runoff would have also been strongly influenced by fires within the Kappinghat Catchment.

KARUAH RIVER ESTUARY

The Karuah River and The Branch Estuaries continued to show signs of significantly impaired estuary health with much higher than desired algal growth and good water clarity. Unlike some other estuaries, excess nutrients from catchment runoff were not linked to the rainfall from late summer indicating that there is a chronic flow of nutrients into the estuary.

RESULTS



WALLIS LAKE

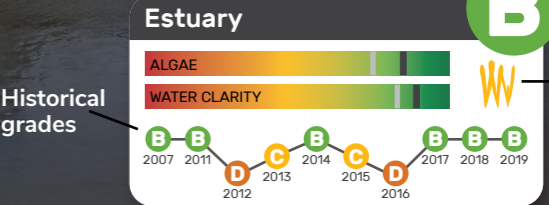
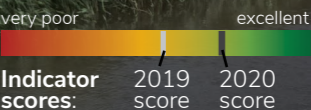
Grades for Wallis Lake, Pipers Creek and Charlotte Bay all dropped from excellent to good this year and were strongly influenced by drought conditions followed by heavy rain. In Wallis Lake and Pipers Creek, the grade was influenced by both water clarity and algal levels. Higher than desirable algal growth in Charlotte Bay was responsible for its drop in grade.

In the Mid Wallamba and Coolongolook Estuaries, water clarity was good but excess nutrient runoff resulted in much higher than desired algal growth. This resulted in a drop from good to fair in the Coolongolook Estuary and a continuation of the fair grade in Mid Wallamba Estuary.

A drop in grade from good to fair in Wallamba Cove was the result of greater than desired algal growth showing that this site continues to be affected by stormwater runoff from Tuncurry.

The depth range where seagrass is able to grow has remained excellent at all sites in Wallis Lake and has improved to good in the Mid Wallamba Estuary.

ESTUARY SCORE KEY



Overall grade: This represents ecological condition, it is a combination of algae and water clarity scores.

Seagrass depth range score: The seagrass score indicates how deep the seagrass is growing and if the seagrass area is expanding or contracting. Where there are no seagrass results, no data was collected at these locations.

For more details on the scientific methods and results contained in this Report Card (Waterway and Catchment Technical Report) and how bushfires and floods impact our waterways visit: www.midcoast.nsw.gov.au/reportcard

very poor, poor, fair, good, excellent

SMITHS LAKE

The grade for Smiths Lake dropped this year from excellent to good. Last summer presented challenging conditions including one of the driest summers on record followed by very heavy rain. The storms brought in nutrients which triggered excess algal growth.

MYALL LAKES

Myall Lake's grade remained excellent this year, but excess algal growth after the February rains meant that the grade for Bombah Broadwater dropped from excellent to good. The condition of Bombah Broadwater, and to some extent Myall Lake, is strongly influenced by runoff from the Myall River Catchment and this year, the drop in grade in the Broadwater was due to increased algal levels. Marked variability in condition between the yearly reports emphasises the need to continue to reduce nutrient runoff from land use activities in the catchment.

The Lower Myall Estuary upstream of Tea Gardens maintained its good grade this year. This area is usually strongly influenced by the condition of the outflow from the Bombah Broadwater. However, when there is little catchment runoff, as was the case this year, the waters moved by the tides are the main influence.

USING SCIENCE TO GUIDE WATERWAY MANAGEMENT

What we do on the land impacts on the quality of water that runs off it. When runoff quality is poor it puts stress on the environment, leading to ecological harm.

Results from monitoring and scientific studies combined with local knowledge and expert advice help Council work out where to put effort to have the most effective approach to managing our waterways.

MONITORING

Monitoring is essential to track the condition of our waterways and provides a link to predictive models and management effectiveness. The ecosystem health results presented in the Report Card help document the 'ecological impact' of stressors. Council monitors the condition of our estuaries so that we can confirm that the actions we are taking on land are achieving the changes we expect in our waterways. Monitoring also allows us to check that predictions in computer modelling are consistent with what is happening in the real world – this is known as validating the model.

Rebecca Swanson

Environmental Scientist, Estuaries and Catchments, Department of Planning, Industry and Environment

"Regular monitoring of water quality and ecological health indicators provides baseline data on the current condition of the waterway. This data can be used to track future change in condition that may occur from development in the catchment, or management actions aimed at reducing pollution entering waterways."

MODELLING

Computerised catchment modelling is used to understand the complexities of natural systems. Modelling examines how these systems work in order to make predictions about what happens if we change land use or activity within the catchment. Wallis, Smiths and Myall Lakes have models that identify the most effective actions to implement when taking all these system complexities into account.

Angus Ferguson

Senior Research Scientist, Department of Planning, Industry and Environment

"Ecosystem response modelling brings together the best available science to quantify and couple catchment pressures with ecosystem processes. Models allow scientists and managers to better understand the causes of poor water quality and to make effects based assessments of different management options. This information helps target and prioritise resources to achieve the best possible outcomes for the waterway and the community."



MANAGEMENT

Agriculture is one of the industries where changes to management can reduce the stressors on the environment. Ecological health assessments of The Branch and Karuah Rivers showed that inputs from the catchment were affecting waterway health. Landholders in The Branch are now using this science to help manage their properties, protecting over 270 hectares of wetlands and 50 hectares of riparian vegetation improving wildlife habitat, agricultural productivity and water quality.

Bryan Royce, Farmer, Le Grande Lande

"The cattle get into the wetlands and pug the soil, generally making a mess particularly when it's wet. The new internal fence and water points keep the cattle out of the wetlands most of the year meaning we are able to get the most out of the good pasture and help protect the local environment."



HOW DO ESTUARY TYPE AND RAINFALL IMPACT WATER QUALITY?

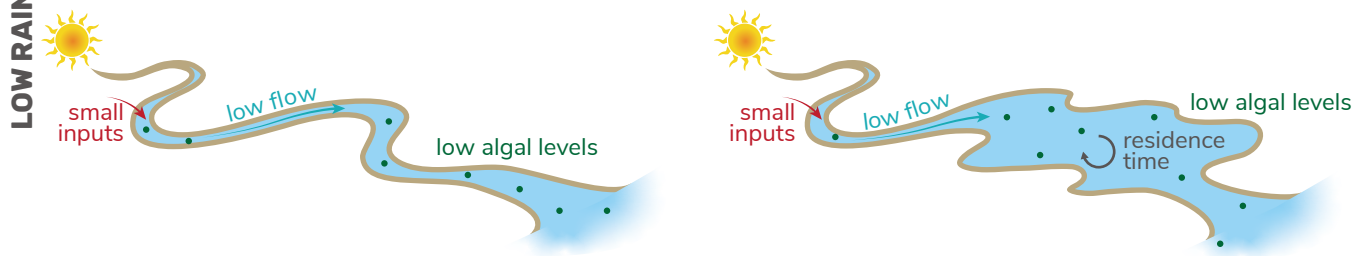
Rainfall and runoff carry sediment and nutrients into our estuaries. How these estuaries are impacted depends on the estuary type and the intensity of the rainfall.

River Estuaries – are generally long and linear with very large catchment areas and a large tidal range. The speed of water flow in river estuaries varies according to rainfall and the volume of catchment runoff.

Lake Estuaries – are generally wide and shallow, with moderate sized catchment areas and low or no tidal range. They also have a longer residence time (how long water, dissolved or suspended material remains in the estuary) than river estuaries.

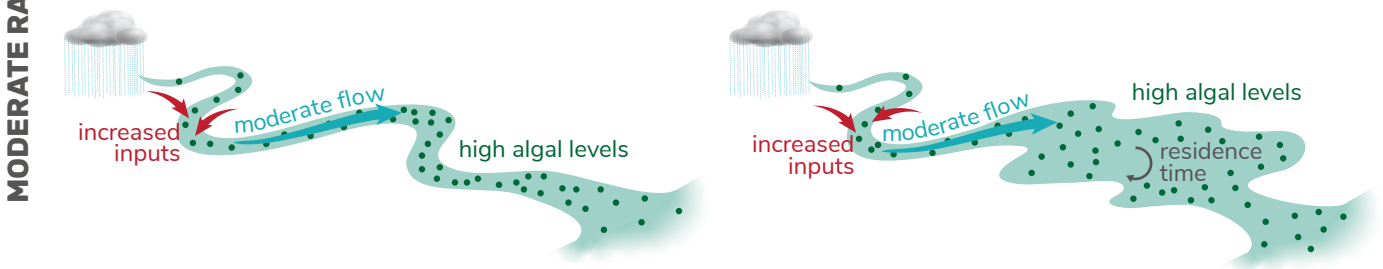
LOW RAINFALL Low algae levels and good water clarity

If the rain is light it soaks into the catchment and doesn't result in runoff and so has little effect on algal levels and water clarity. Under these conditions, material already deposited in an estuary drives water quality.



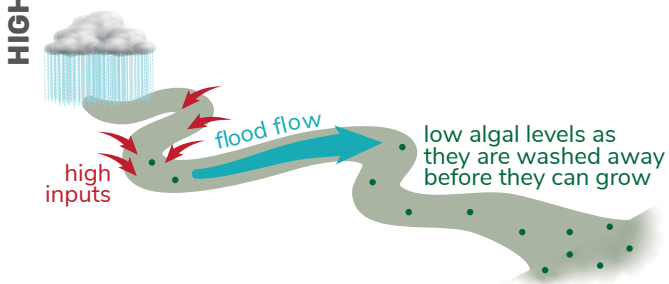
MODERATE RAINFALL High algal levels and poor water clarity

If rain is moderate then enough nutrients to stimulate algal growth reach both river and lake estuaries. In river estuaries as the river flow is not too fast the water stays in the system long enough (residence time) for high levels of algal growth. A similar process occurs in lake estuaries.



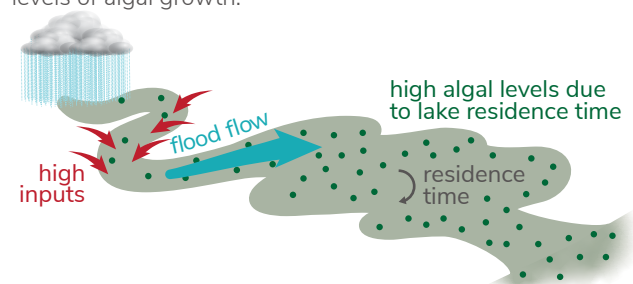
HIGH RAINFALL Low algal levels and poor water quality

During flooding conditions in river estuaries, runoff carries with it high levels of nutrients and sediments. However, because the water moves quickly through the system algae doesn't have an opportunity to grow.



HIGH RAINFALL High algal levels and poor water clarity

Lake estuaries also receive large amounts of nutrients and sediment during flooding conditions. But because the water is trapped or only moves through slowly (longer residence time) nutrients will remain in the estuary long enough to trigger high levels of algal growth.



The 2019/20 sampling period provided an excellent opportunity to see these patterns in action

Of the river estuaries, Manning River experienced low rainfall during the first half of the sampling period resulting in good water clarity and low algae levels. After flooding catchment runoff resulted in poor water clarity, but low algae levels due to the high flows moving through the river so quickly.

Of the lake estuaries Wallis, Myall and Smiths Lakes experienced rainfall during the middle of the sampling period which led to poor water clarity and high algae levels, this pattern continued during and after flooding conditions due to the long residence time of the lakes.