Central Coast Council

Central Coast Waterways report card 2019-20

central coast waterways

Introduction

This is the third combined report card for waterways of the Central Coast Local Government Area. It includes the estuarine areas of Southern Lake Macquarie, Tuggerah Lakes, Brisbane Water, the lower Hawkesbury River and our larger coastal lagoons.

The ecological health data presented here were collected throughout 2019-20.

Central Coast Council monitors the ecological health of our lakes, estuaries, rivers, creeks and lagoons to evaluate condition, measure change through time and target investment and on-ground works to improve ecosystem health. A healthy waterway is one that supports natural processes, is resilient to change, can recover from human impacts, and is relatively stable and sustainable through time.

By reporting the monitoring results to the community each year, Council aims to raise awareness about the state of our waterways, and the pressures that affect ecological health.

> Our diverse estuaries support abundant meadows of seagrass and macroalgae - home to the elusive White's Seahorse who gently winds its tail around the seagrass leaves and feasts on tiny amphipods as they pass by. Prawns, worms, molluscs and small crustaceans gather tiny food particles from the sediment or filter them from the flowing water. They in turn becoming dinner for flathead, whiting and yellowfin bream. Our waterways are a world of their own, and they are ours to protect.

Central Coast waterways

The Central Coast Local Government Area is located on the east-coast of New South Wales between Sydney and Newcastle. It is one of the largest Council areas in NSW covering an area of 1,845 km^2.

The Central Coast's waterways form part of the NSW marine estate, and are managed through implementation of Estuary and Coastal Zone Management Plans.

From the southern shores of Lake Macquarie and the valleys and floodplains of Tuggerah Lakes to the delicate coastal lagoons, rugged Brisbane Water and the shores of the mighty Hawkesbury - the Central Coast's waterways are extensive and unique. They connect our natural landscapes, carrying water from the catchments to the coast and supporting a range of important environmental, social and cultural values and uses. The health and beauty of our waterways is vital to our region's strong tourism industry and our local identity.

Community Strategic Plan

The value the community places on our local waterways was demonstrated through the development of the Community Strategic Plan (2018-2028). Maintaining environmental resources for the future and cherishing and protecting the natural beauty of the Central Coast were highlighted as key focus areas for the Central Coast.

Methods

The Central Coast waterways report card is like a health check for our estuaries: it compares current ecological health with ideal estuary health and can be used to track changes over time.

The program is designed to be consistent with the NSW Natural Resources Monitoring, Evaluation and Reporting (MER) Program and to address locally relevant issues. By following the MER protocols, waterway ecological health can be compared to other estuaries throughout NSW.

Our scientists measure turbidity, chlorophyll-a and seagrass depth range at each of the sampling sites. These tell us about how the ecosystems are performing in response to catchment pressure. The results are compared to established trigger values for each estuary type – lake, lagoon or back dune lagoon – and are used to calculate the water quality grades.

T **Turbidity** is a measure of water clarity or cloudiness. Elevated turbidity is caused by more sand, silt, clay and microalgae suspended in the water. Long periods of high turbidity will negatively affect estuary health.

C **Chlorophyll-a** is an indicator of levels of microalgae and nutrients in the water. High levels of chlorophyll-a indicate high inputs of nutrients which can lead to algal blooms and a decline in water quality.

S **Seagrass depth range** is a biological indicator of water clarity over longer time periods. Seagrass grows slowly and depends on high water clarity, good access to sunlight and relatively low nutrient concentrations to survive and thrive.

These indicators are used to calculate an overall grade for each site. Sites are selected to represent the surrounding area. Healthy estuaries generally have low levels of microalgae and turbidity, and strong seagrass communities.

Ecological health is used to describe the current state of the environment, and how that compares to an ideal state as set out in the relevant management objectives and plans.

Ecological health does not refer to environmental health issues such as drinking water quality, safety for swimming, heavy metal contamination, disease, bacteria, viruses or our ability to harvest shellfish or fish.

The grades explained

A **Excellent** The indicators meet all benchmarks for more than 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.

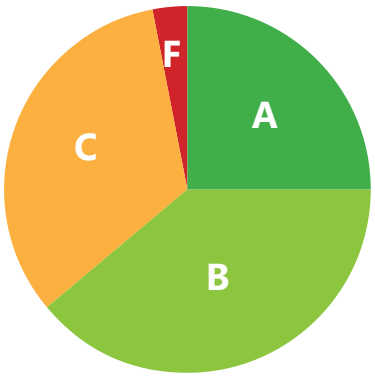
C **Fair** The indicators meet some benchmarks for part of the year. Equal to the next 30% of scores in NSW.

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

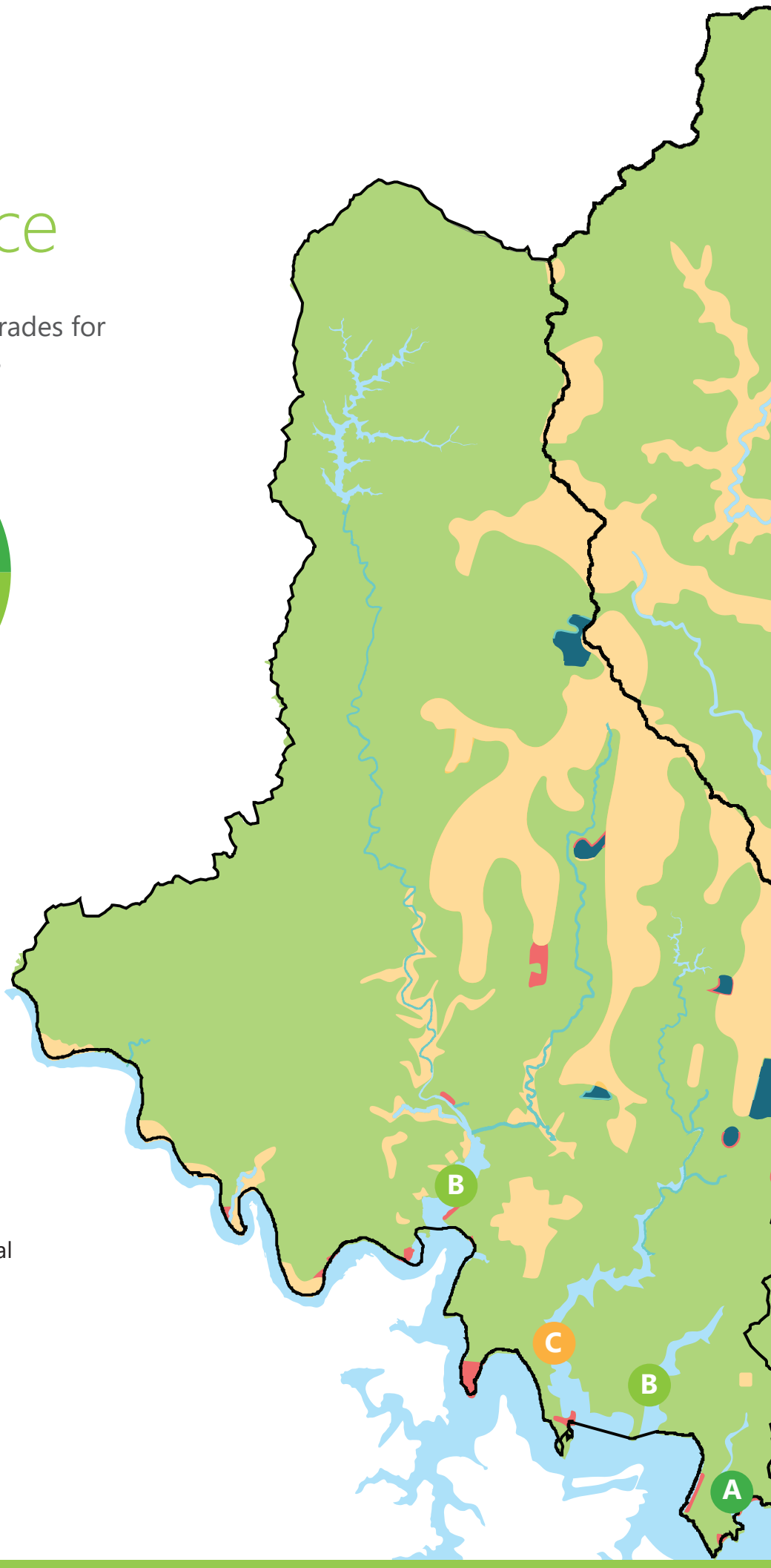
F **Very Poor** The indicators never meet benchmarks. Equal to the worst 5% of scores in NSW.

Results at a glance

Overall water quality grades for Central Coast estuaries

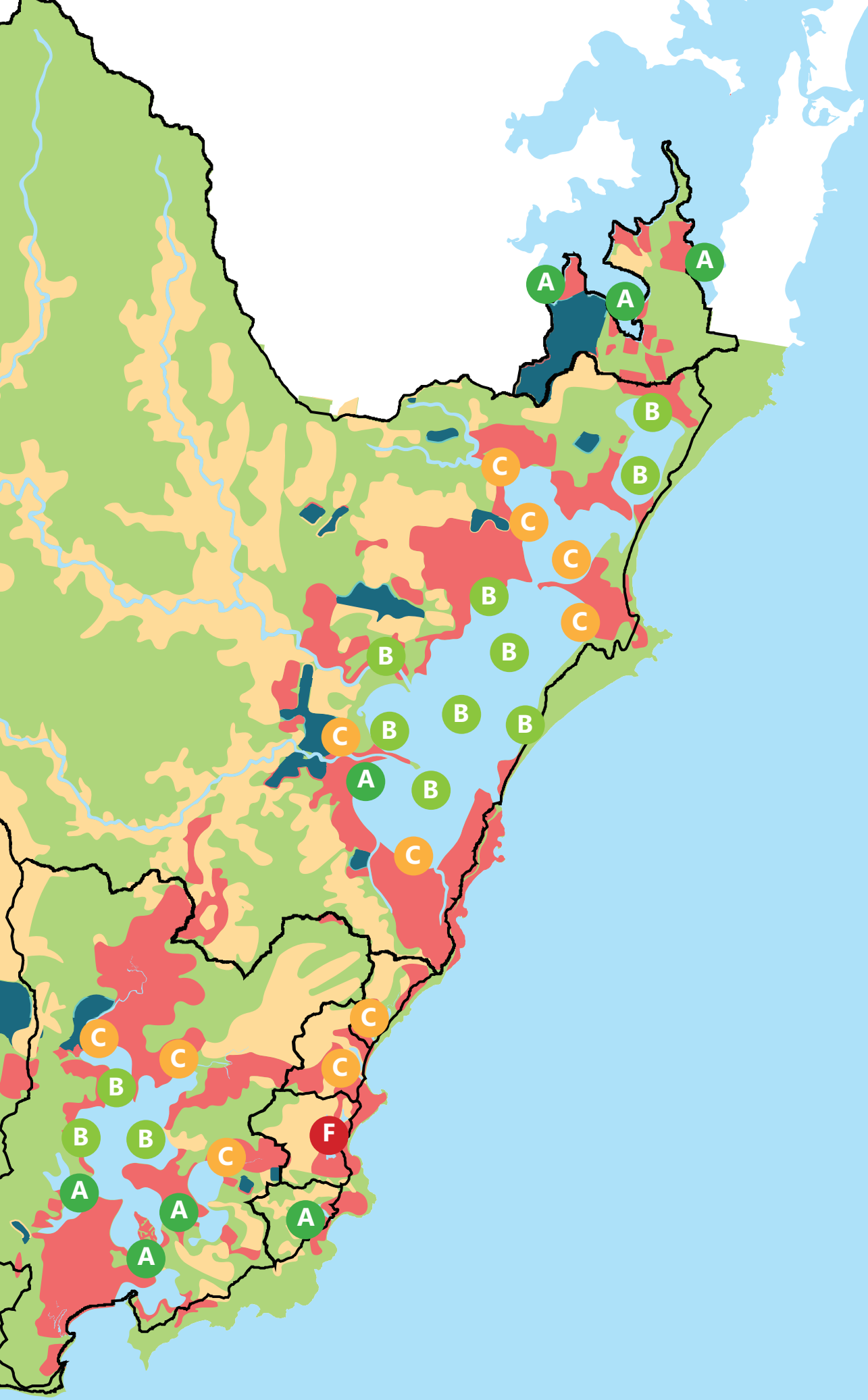


- A 25%
- B 39%
- C 33%
- F 3%



LEGEND

- Industrial/Commercial
- Urban
- Rural
- Natural Area
- Water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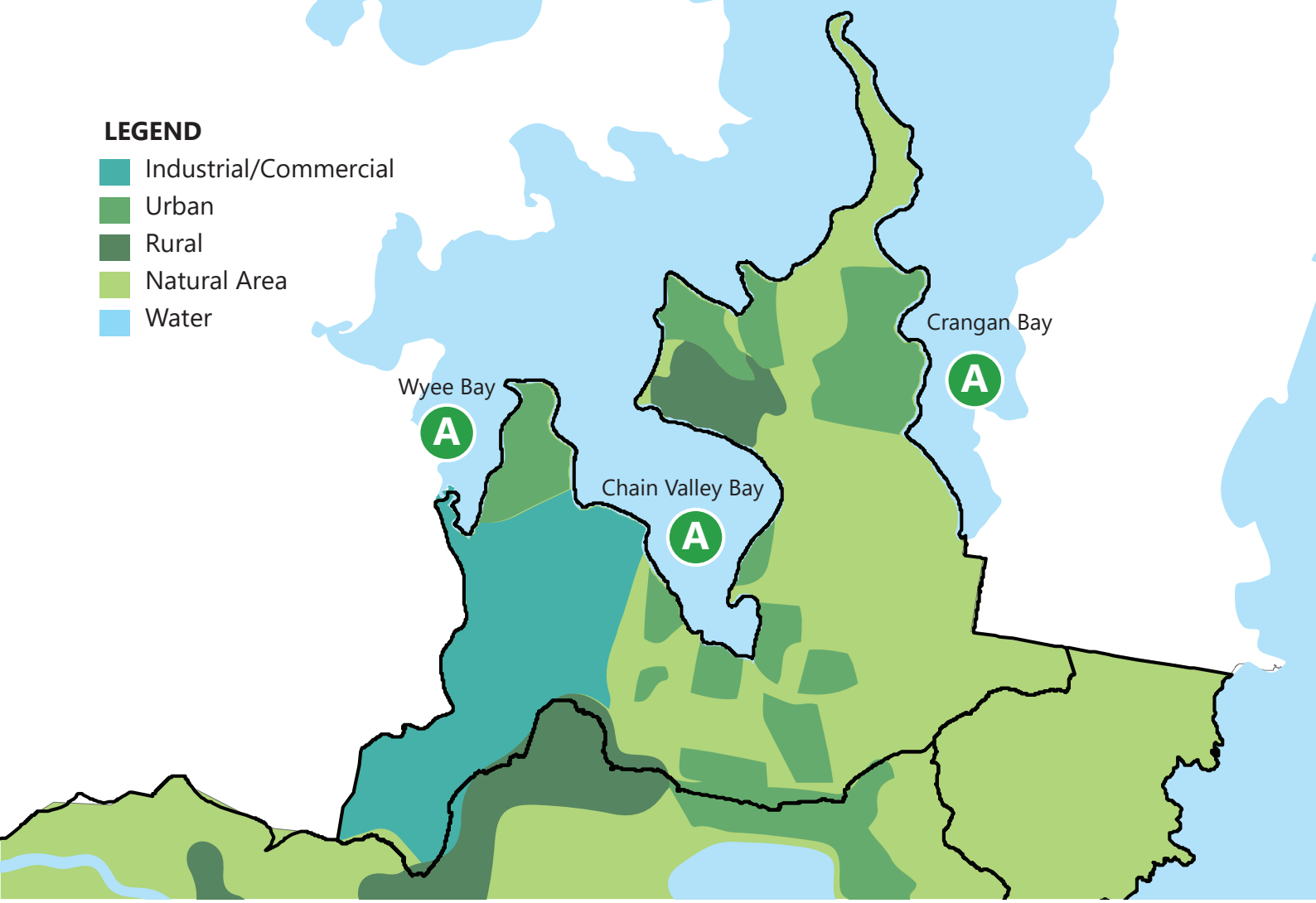
Southern Lake Macquarie



Monitoring in Southern Lake Macquarie commenced in 2017-18.

Water quality in the three southern bays of Lake Macquarie remained excellent for the third consecutive year. No trigger value exceedances were observed for the duration of sampling with both turbidity and chlorophyll-a levels remaining well below their respective trigger values. Seagrass depth range was again graded excellent at Crangan Bay, and fair at Chain Valley Bay and Wyee Bay.

A Wyee Bay
2018-19 **A** *2017-18* **A**

A Chain Valley Bay
2018-19 **A** *2017-18* **A**

A Crangan Bay
2018-19 **A** *2017-18* **A**

2019-20 was the final year of the Tuggerah Lakes Improving your Local Parks and Environment Grant (2017-20) – to view current and past projects, please visit loveourwaterways.centralcoast.nsw.gov.au/projects

Tuggerah Lakes

Monitoring in Tuggerah Lakes commenced in 2011-12.

Lake Munmorah

Water quality and overall ecological health remained good at both the basin and nearshore sites in Lake Munmorah during the 2019-20 sampling period. This is consistent with previous years. Turbidity remained good in the basin and improved from good to excellent at the nearshore site. No trigger value exceedances were recorded at this site. Chlorophyll-a remained stable in the nearshore and improved from fair to good in the main basin. Seagrass depth range has increased marginally which is a good sign however still fell within the fair category. It is hoped this improving trend for seagrass will continue in future years.

Budgewoi Lake

The water entering Budgewoi Lake from Wallarah Creek exceeded both turbidity and chlorophyll-a trigger values on most occasions throughout 2019-20, sometimes quite substantially. Lower quality water from the estuary catchments has a long-term impact on downstream estuary health.

Overall water quality has improved from poor to fair at Lake Haven in response to lower turbidity throughout the monitoring period. Improvements in turbidity, chlorophyll-a and seagrass depth range were also observed in Budgewoi Lake with the site retaining an overall grade of fair. Recovery of seagrass at this location is a positive sign for ecological health. A range of water quality improvement works are underway in the Budgewoi Lake catchment (yourvoiceourcoast.com/tuggerah-lakes-restoration).

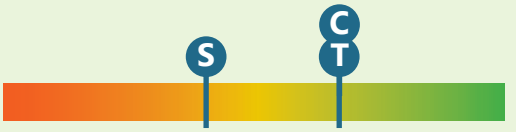
Northern Tuggerah Lake

Overall water quality in the north zone of Tuggerah Lake improved from fair in 2018-19 to good in 2019-20 due to an improvement in both turbidity and chlorophyll-a. Exceedances of the trigger values for both indicators were less frequent than in the previous year, with both variables graded as good. A recovery in seagrass depth range was also observed in this location. Canton Beach has declined from excellent in 2017-18 to fair in 2019-20 in response to two large turbidity exceedances during the monitoring period. Chlorophyll-a remained good at Canton Beach. Gorokan returned from fair to good for all indicators with only minor exceedances following the February 2020 flood.

Lake Munmorah

B Lake Munmorah shore
2018-19 **B** *2017-18* **B**

B Lake Munmorah basin
2018-19 **B** *2017-18* **B**

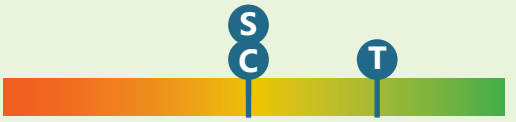


Budgewoi Lake

C Wallarah Creek
2018-19 **C** *2017-18* **C**

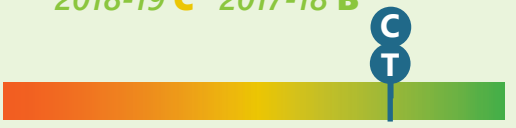
C Lake Haven
2018-19 **D** *2017-18* **C**

C Budgewoi Lake
2018-19 **C** *2017-18* **C**

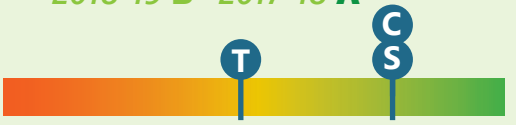


Northern Tuggerah Lake

B Gorokan
2018-19 **C** *2017-18* **B**



C Canton Beach
2018-19 **B** *2017-18* **A**



B Tuggerah Lake North
2018-19 **C** *2017-18* **B**

Central Tuggerah Lake

Overall water quality in Wyong River improved from fair in to good due to an improvement in chlorophyll-a levels. Water clarity in Wyong River was good throughout the monitoring period whilst chlorophyll-a often exceeded the trigger value and received a fair rating. Elevated chlorophyll-a can be an indicator of persistent nutrient pollution which triggers microalgal growth. This is likely to have long-term impacts on estuary water quality given catchment inputs are the most significant source of water entering the estuary.

Tuggerah Bay rallied from a particularly poor year in 2018-19 returning to a good rating for all indicators including overall water quality in 2019-20. Seagrass depth range has remained stable at this location since 2012-13 demonstrating the resilience of the system. Turbidity improved at the Tuggerah Lake Centre zone resulting in an overall improvement from fair to good, whilst a minor decline from excellent to good was observed at The Entrance in response to one large chlorophyll-a exceedance at the end of February following heavy rain and flood conditions.

Southern Tuggerah Lake

Overall water quality in Ourimbah Creek remained fair for the third consecutive year. Once again, this result was largely a result of persistent high chlorophyll-a levels often well above the trigger value indicating persistent nutrient pollution from this catchment.

Nearby Chittaway Bay has returned to an excellent overall water quality grade with no trigger value exceedances recorded for turbidity and only one exceedance for chlorophyll-a.

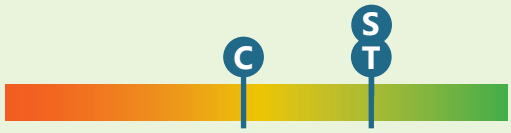
An improvement in all variables was recorded in the southern zone of Tuggerah Lake with each being graded as good in 2019-20. Seagrass depth range improved from fair to good at this location which is a positive sign for overall ecological health. The southern foreshore adjacent to Tumbi Creek returned to fair in 2019-20 with improvements recorded in turbidity, chlorophyll-a and seagrass depth range. Turbidity was recorded as very poor in 2018-19 and returned to fair this year as a result of far fewer and smaller turbidity exceedances at this location.

Central Tuggerah Lake

B Wyong River
2018-19 **C** *2017-18* **C**

B Tuggerah Bay
2018-19 **D** *2017-18* **B**

B Tuggerah Lake Centre
2018-19 **C** *2017-18* **B**



B The Entrance
2018-19 **A** *2017-18* **A**

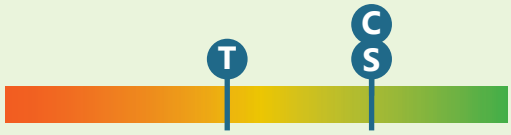
Southern Tuggerah Lake

C Ourimbah Creek
2018-19 **C** *2017-18* **C**

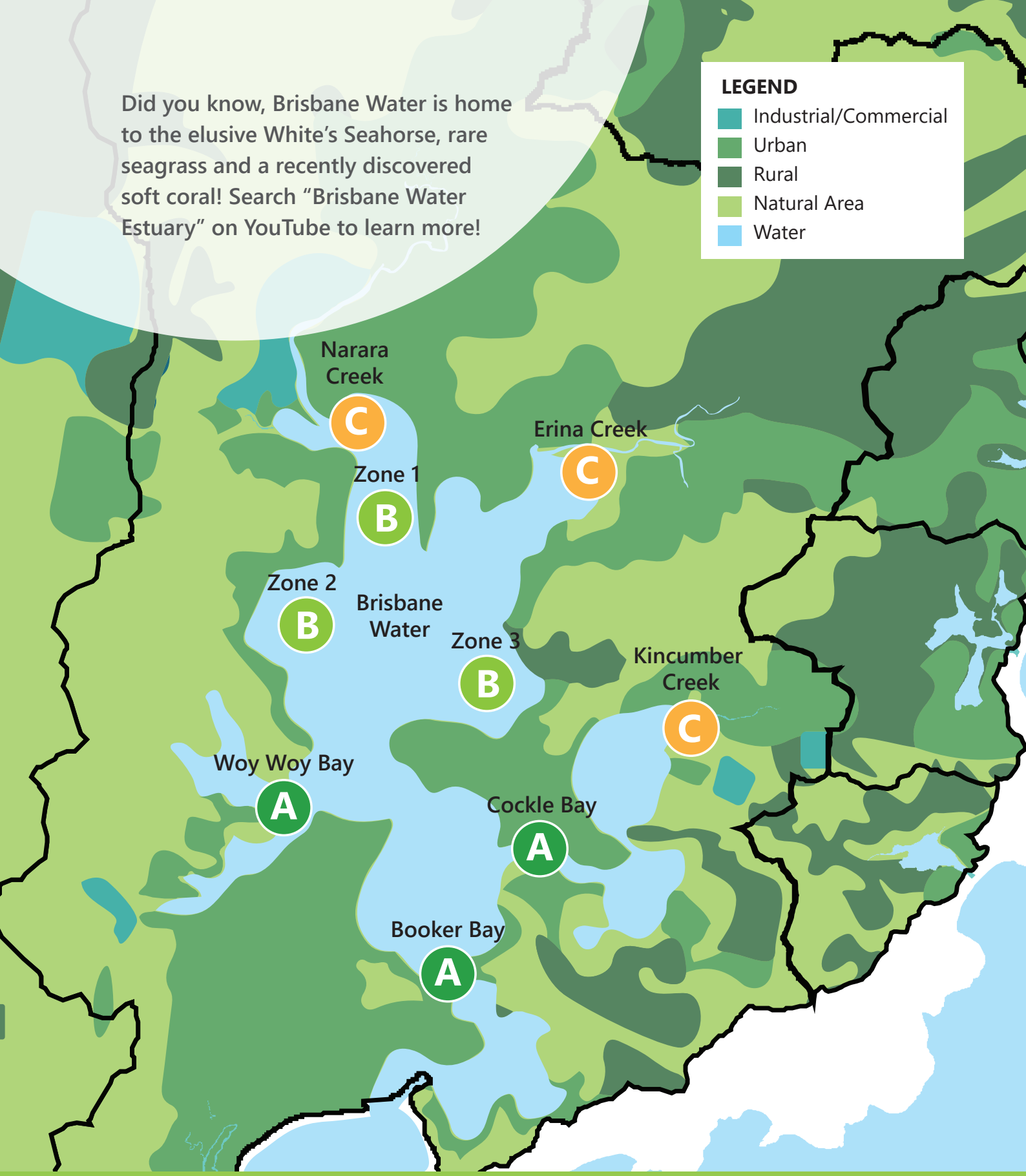
A Chittaway Bay
2018-19 **B** *2017-18* **A**

B Tuggerah Lake South
2018-19 **B** *2017-18* **B**

C Tumbi Creek
2018-19 **D** *2017-18* **B**



C *Chlorophyll-a* T *Turbidity* S *Seagrass depth range*



Brisbane Water

Water quality throughout Brisbane Water graded from fair in the upper reaches to excellent closer to the mouth. The main basin sites including Zones 1, 2 and 3, declined from excellent to good in response to very high chlorophyll-a levels following floods in February 2020, whilst Woy Woy Bay, Cockle Bay and Booker Bay remained excellent for the third consecutive year. The impacts of urbanisation in the upper reaches are evident and point to the ongoing need for source control of pollution to ensure the long-term health of this ecologically and economically valuable waterway.

High chlorophyll-a concentrations from Erina Creek and Narara Creek were once again recorded during the sampling period, primarily associated with heavy rainfall and runoff. Turbidity was generally good at Narara Creek and fair at Erina Creek. A notable increase in seagrass depth range was observed at Erina Creek (nearly double) which is a positive sign for overall ecological health.

Overall water quality and ecological health in Kincumber Broadwater improved from poor to fair. A significant improvement in turbidity was observed, despite the trigger value being exceeded on all but one occasion. These exceedances however where not as large as those recorded in previous years. Seagrass depth range at this location was again good for the second consecutive year.

C Narara Creek
2018-19 **B** *2017-18* **C**

C Erina Creek
2018-19 **C** *2017-18* **B**

B Brisbane Water Zone 1
2018-19 **A** *2017-18* **A**

B Brisbane Water Zone 2
2018-19 **A** *2017-18* **A**

B Brisbane Water Zone 3
2018-19 **A** *2017-18* **A**

C Kincumber Broadwater
2018-19 **D** *2017-18* **D**

A Woy Woy Bay
2018-19 **A** *2017-18* **A**

A Cockle Bay
2018-19 **A** *2017-18* **A**

A Booker Bay
2018-19 **A** *2017-18* **A**

C *Chlorophyll-a* T *Turbidity* S *Seagrass depth range*

A detailed water quality and catchment audit for Terrigal Beach, Terrigal Haven and the coastal lagoons began in 2019. For more information visit yourvoiceourcoast.com/tcla

Coastal Lagoons

C Wamberal Lagoon

2018-19 **C** *2017-18* **B**

Overall water quality within Wamberal Lagoon remained fair for the 2019-20 sampling period, with turbidity exceeding the trigger value on all sampling occasions. Turbidity values were again often higher in Zone 1 (furthest upstream site) than in Zone 2. Chlorophyll-a concentrations were generally below the trigger level throughout the lagoon, with only one relatively minor exceedance occurring during the sampling period.

C Terrigal Lagoon

2018-19 **C** *2017-18* **C**

Overall water quality within Terrigal Lagoon remained fair during the 2019-20 sampling period. Turbidity values exceeded the trigger values for all sampling occasions whilst chlorophyll-a within the lagoon was good despite the trigger being exceeded multiple times. A detailed water quality and catchment audit of Terrigal Beach, Terrigal Haven and Terrigal Lagoon commenced in 2019 – yourvoiceourcoast.com/tcla.

F Avoca Lagoon

2018-19 **F** *2017-18* **F**

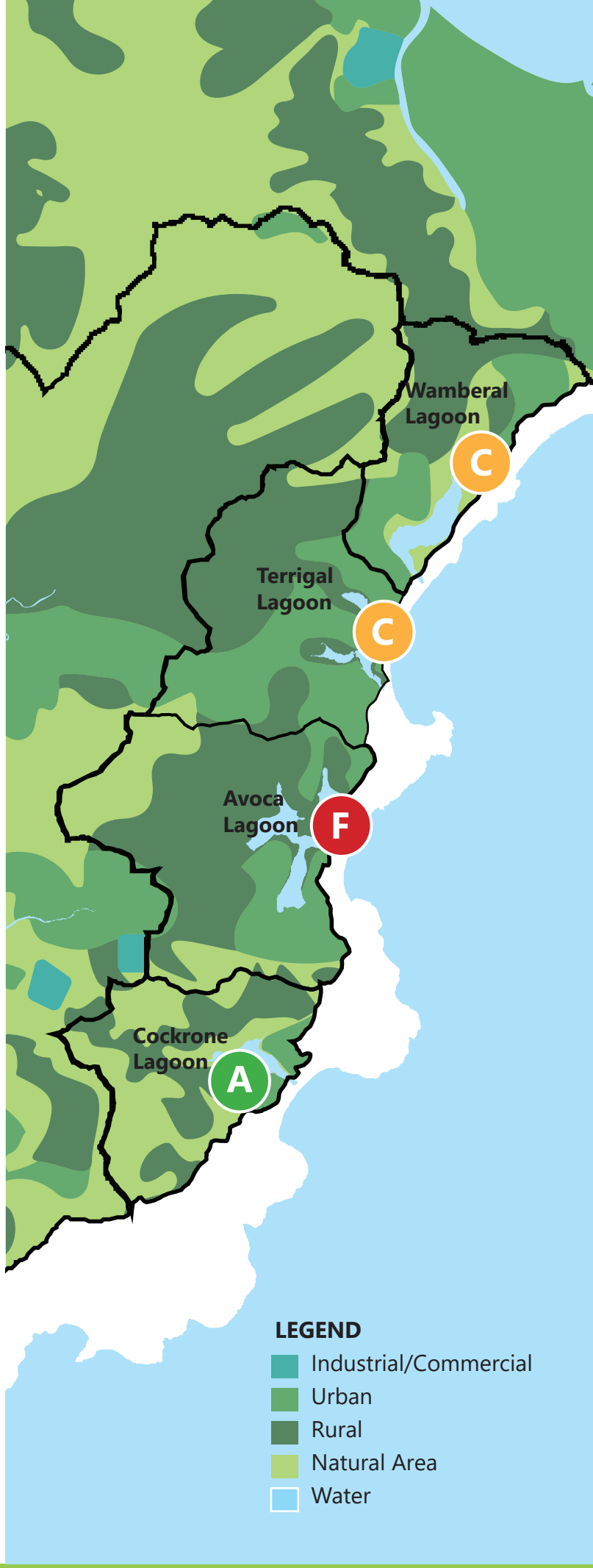
Overall water quality in Avoca Lagoon was again very poor, with turbidity and chlorophyll-a both exceeding their respective trigger values on most of the sampling surveys throughout 2019-20. Turbidity at zone 1 (upstream site) was always much greater than zone 2 (downstream site), with turbidity often several times greater than the trigger value. A detailed catchment audit of Avoca Lagoon commenced in 2019 to help understand the drivers of poor water quality and to rectify them – yourvoiceourcoast.com/tcla.

A Cockrone Lagoon

2018-19 **B** *2017-18* **A**

Overall water quality within Cockrone Lagoon was excellent for the 2019-20 sampling period. No trigger value exceedances were observed for either turbidity or chlorophyll-a, with both variables often well below their respective trigger value.

S *Seagrass depth range is not measured in the coastal lagoons*



Lower Hawkesbury River

A Patonga Creek

2018-19 **A**

Overall water quality within Patonga Creek continued to be excellent, with only two minor trigger value exceedances for turbidity observed during the sampling period.

B Mullet Creek

2018-19 **B**

Overall water quality in Mullet Creek remained good despite the trigger value for turbidity being exceeded on all sampling occasions and all but one occasion for chlorophyll-a. While most of the trigger value exceedances for turbidity were relatively minor, chlorophyll-a was close to or greater than double the trigger values on several occasions. As seen previously, most exceedances for turbidity were recorded in Zone 2 (lower site), with turbidity recorded in Zone 1 (upper site) generally below the trigger values.

C Mooney Mooney Creek

2018-19 **C**

Overall water quality within Mooney Mooney Creek continued to be fair in 2019-20. At both upstream and downstream sites, turbidity and chlorophyll-a regularly exceeded the trigger values. In the case of turbidity, the increase was marginal whilst chlorophyll-a exceeded the trigger value by a large amount, with one occasion measuring four times the trigger value.

B Mangrove Creek

2018-19 **C**

Overall water quality in Mangrove Creek improved from fair in 2018-19 to good in 2019-20. This improvement in overall grade was driven by chlorophyll-a, with only two minor exceedances of the trigger value observed this year compared the previous year where the trigger value was significantly exceeded on all but one occasion. The trigger value for turbidity was exceeded on almost all occasions, however these exceedances were only relatively minor.

Management actions

The health of the Central Coast's waterways is dependent on the health of the broader catchment areas – whatever comes down the rivers or enters the stormwater, ends up in our waterways and can have good or bad impacts. Our personal actions can directly affect the health of our waterways, not only right where we live or work but all the way to the estuaries and ocean. By working together, we can all do our bit to improve and protect our beautiful coastal areas now, and for the future.

Actions Council has taken to help

Council has a strong commitment to the health of our local waterways and catchments. In the 2019-20 financial year Council:

- continued the Terrigal and Coastal Lagoon Audit – a comprehensive water quality monitoring and improvement program in partnership with the NSW Government – yourvoiceourcoast.com/tcla including significant on-ground works to resolve water quality issues
- continued rehabilitation of natural wetlands at Elizabeth Bay, Doyalson, Budgewoi, Toukley, Tacoma, Chittaway Bay, Berkeley Vale, Erina, Davistown, Saratoga, Bensville, Tascott, Avoca and Terrigal and restoration of coastal saltmarshes along the shores of Tuggerah Lake and Brisbane Water
- supported 80 Environmental Volunteer groups to conserve natural areas and improve the amenity of the Central Coast
- constructed new stormwater quality improvement devices at Umina Beach, The Entrance, Gorokan and Blue Haven to reduce pollutant loads to the waterways
- maintained a network of over 420 stormwater quality improvement devices throughout the estuary catchments to improved water quality
- intercepted and removed over 1600 tonnes of sediment and pollution from stormwater quality improvement devices before it reached the waterways
- removed around 10,000m^3 of excess seagrass wrack and floating algae from Tuggerah Lakes. In addition to this, a total of 1,636 tonnes of material was collected from the foreshores following the February 2020 flood
- launched a new Love Our Waterways website, which covers all things Tuggerah Lakes
- published the Tuggerah Lakes Estuary Management Plan Summary of Implementation Report (2008-20) – **centralcoast.nsw.gov.au/tuggerahlakesestuary**

Simple things you can do to help keep your patch healthy

- Reduce, reuse, recycle - sustainable living is good for us all – our own health, our environment, and the future of our planet. Check out our series of Environmental Education videos at **youtube.com/playlist?list=PLrbmaCJMMhmK1O6iHNLeXf4ZC-JAxABAV**
- Enjoy your boating sensibly – steer clear of seagrass beds, adhere to speed limits and use a boat ramp to launch your vessel
- Fish responsibly – remember to take your gear home with you and stick to catch limits. Handle fish carefully and take home only what you need.
- Save our Sewers by flushing responsibly – only the three Ps: pee, poo and toilet paper! Sewage overflows have a terrible impact on our environment
- Get involved! Protect saltmarsh, wetlands and bushland first hand by joining your local Environmental Volunteer group.

Did you know – illegal sewer connections overload the sewer network, causing overflows and pollution of waterways... check your plumbing to make sure your house is properly connected!

WASH YOUR VEHICLE ON THE GRASS!

IF IT'S ON THE GROUND, IT'S IN OUR WATERWAYS.

Central Coast Council has published six interactive Multi-Touch Books about our waterways. Two about wetlands, one about Brisbane Water and three about Tuggerah Lakes. The wetlands books contain interactive activities, games, videos and animal sounds and are linked to the Australian curriculum for primary and infant students. The Brisbane Water book covers major habitats and tips on how we can all help and the Tuggerah Lakes books look at habitats, impacts, case studies and recreational activities including fishing, birdwatching, walking and bike riding. The Explore book partners with the Tuggerah Lakes Estuary Explore application that you can download to discover more fishing, birdwatching and walking/riding areas around the lakes. Download the books for FREE on the Apple book store and the app on the Apple and Google Play stores.

More Information

centralcoast.nsw.gov.au/tuggerahlakesestuary

centralcoast.nsw.gov.au/waterwayhealth

loveourwaterways.centralcoast.nsw.gov.au

environment.nsw.gov.au/resources/soc/130125esthlthprot.pdf

waterquality.gov.au/anz-guidelines/resources/previous-guidelines/anzecc-armcanz-2000

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NSW GOVERNMENT

Central Coast Council