# CLYDE RIVER ESTUARY Estuary Ecosystem Health Report Card 2016-17

### **Ecosystem Health**

Based on the indicators assessed, the health of Clyde River is good. Algae levels were generally low and water clarity generally high. Seagrass showed little change, whereas saltmarsh decreased and mangroves increased in distribution.

This assessment is based on chlorophyll a and turbidity collected by Council between July 2016 to June 2017, and estuarine vegetation change between 2012 and 2017 mapped on behalf of Council. Compared to the 2010-11 assessment, overall estuary health shows a slight decrease from very good to good. The most noticeable change was the saltmarsh grade dropping from very good to fair reflecting the recent mapping of mangrove in areas previously mapped as saltmarsh.

For more detailed information about Council's sampling program please refer to Council's website www.esc.nsw.gov.au/living-in/about/our-natural-envir onment/estuaries-of-eurobodalla/estuary-health-andwater-quality-monitoring

#### **Estuary Information**

Catchment area (km <sup>2</sup> ):	1722.9
Estuary volume (MI):	50736.6
Estuary type:	Drowned valley estuary
Entrance:	Permanently open
Major tributaries:	Cyne Mallowes Creek and Buckenbowra River
Average Yearly Rainfall: 996.6mm (Stn No:69052) July 2016-June 2017: 678.7mm (total)	
Land Use (Area): Urba (2005 data) Rura	n: 0.5% Forest: 95.7% al: 3.3% Other: 0.5

#### **Clyde River Estuarine Vegetation**





## Water Quality Indicators (Grades based on OEH Estuary Health Assessment Methodology)



**Chlorophyll a** indicates the amount of microscopic algae, called phytoplankton, growing in the water. Excessive input of nutrients from catchment runoff (urban stormwater, agricultural runoff, and sewage overflows) can increase chlorophyll a levels and lead to algal blooms and detrimental effects on estuarine plants and animals.

For 2016-17 the Clyde River overall received a good rating for chlorophyll a with 25% of total samples exceeding guideline values, with these samples barely exceeding the guideline. The sampling site just upstream from the Clyde Bridge had the highest percentage of exceedances at 58%. As a comparison, chlorophyll a data collected by the State Government over the summer of 2016-17 reported an overall very good rating for chlorophyll a, but was based on a different sampling regime.



**Turbidity** is a measure of light scattered by suspended particles such as sediment, algae and dissolved material in the water which affect its colour or murkiness. Turbidity can increase from sediments transported in catchment runoff (particularly after heavy rainfall), shoreline erosion and increased microscopic algae. Increased turbidity can have negative impacts on seagrasses and fish.

For 2016-17 the Clyde River overall received a good rating for turbidity with 11% of total samples exceeding guideline, with these samples barely exceeding the guideline. The sampling site just upstream from the Clyde Bridge had the highest percentage of exceedances at 33%, with other sites rarely exceeding guidelines. As a comparison, turbidity data collected by the State Government over the summer of 2016-2017 reported an overall very good rating for turbidity, but was based on a different sampling regime.



#### Estuarine Vegetation Indicators (Grades based on % gain or loss in extent)



**Seagrasses** are aquatic flowering plants that form meadows near shore. They are highly productive, provide nursery and foraging habitat (for fish, crustaceans and molluscs), bind sediments against erosion and help regulate nutrient cycling. They are very sensitive to changes in water clarity.

Seagrasses in the Clyde River showed no overall change in percentage cover between 2012 and 2017 and therefore received a grade of good. Previously large gains were observed between 2006 and 2012.



**Mangroves** grow between mid and high tide levels. They are an important food source, provide habitat for a number of species such as crabs and juvenile fish, protect shorelines and cycle nutrients and carbon. While an increase in mangroves can be a positive outcome where they are recolonising in areas previously removed, increases in mangrove distribution can sometimes be at the expense of other important habitat types such as saltmarsh, which could be viewed as a negative outcome.

Mangroves in the Clyde River increased by 18% between 2012 and 2017, which continues the trend identified since 1985. Large areas previously classified as saltmarsh were mapped as mangrove in the Mcleods Creek, Pelican Inlet, Waterfall Creek and Deep Creek areas. New areas of mangrove were also mapped upstream of Nelligen, creating a continuous distribution along the banks. However, overhanging trees in this location would have made it difficult to previously identify mangroves from aerial photography and some of this increase may be due to greater effort of field validation.



NOT A TOTAL

**Saltmarsh** is a community of plants and animals that grows above the mangroves at the highest tidal levels. Saltmarsh is important in estuarine food webs, providing a site for invertebrate breeding and a feeding area for economically important fish and shorebirds. Saltmarsh decline is a worrying trend from a number of estuaries in NSW and has led to saltmarsh being listed as a threatened ecological community under the Biodiversity Conservation Act 2016. Declines in recent years have been linked to both increased sedimentation from catchment land use pressures and sea level rise.

Saltmarsh in the Clyde River decreased by 39% between 2012 and 2017 and therefore received a grade of fair. This is in contrast to the increase in saltmarsh identified between 2006 and 2012 surveys. Decreases occurred around Mcleods Creek, Pelican Inlet, Waterfall Creek where mangroves are colonising saltmarsh areas. While new patches of saltmarsh were mapped along the Buckenbowra River and near Nelligen they are likely related to greater effort on field validation.

This report card is an initiative of Eurobodalla Shire Council, with financial and technical support from the NSW Government Estuary Management Program





