**Overall Estuary Health**

The overall health of the Shoalhaven River estuary is good. The water of the Shoalhaven River is generally clear with low levels of algae. The important habitats of seagrass, saltmarsh and mangroves all showed increases in their distribution.

This assessment is based on chlorophyll a and turbidity collected by Council between September 2009 to January 2011, and estuarine vegetation change between 2003 and 2010 calculated by the NSW Department of Primary Industries. While this assessment is a snapshot in time, it provides a baseline against which future sampling can be compared, allowing us to track how well we are managing this important estuary.

For more detailed information about Council’s sampling program and the methodology for analysing data, please refer to the accompanying technical report located on Council’s website.

**Estuary Information**

- **Catchment area (km²):** 7085.8
- **Estuary area (km²):** 31.9
- **Estuary volume (ML):** 86508.6
- **Estuary type:** Mature barrier estuary
- **Entrance:** Permanently open
- **Major tributaries:** Shoalhaven River and Crookhaven River
- **Average Yearly Rainfall:** 765.8mm (Stn No:68213) 2010: 609mm (total)
- **Land Use (Area):** Urban: 3.5%  Forest: 63.2%  Rural: 31.8%  Other: 1.5%

**Shoalhaven River Estuarine Vegetation**

- **Saltmarsh**
- **Mangroves** (unscored)
- **Seagrass**

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**Shoalhaven River**

- **Nowra**
- **Bomaderry**
- **Berrys Canal**
- **Greenwell Point**
- **Shoalhaven Heads**
- **Schoharie Island**
- **Comerong Island**
- **Old Man Island**

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**Chl-a**  **Turbidity**

- **A**  **B**  **C**

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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 2010/11 the Shoalhaven River overall received a good rating for chlorophyll a with 28% of total samples exceeding guideline values, with these samples barely exceeding the guideline. The two sampling sites near Berrys Canal both had 41% of samples exceeding guideline values, indicating possible excessive nutrient input at these locations. As a comparison, chlorophyll a data collected by the State Government between 2008 and 2009 had 32% of samples exceeding guideline values, 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 2010/11 the Shoalhaven River as a whole received a good rating for turbidity with 24% of total samples exceeding guideline values, with these samples barely exceeding the guideline. The sampling site west of Pig Island had the highest percentage of exceedances at 41%. As a comparison, turbidity data collected by the State Government between 2008 and 2009 all complied with guideline values, 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 Shoalhaven River increased by 27% between 2003 and 2010, resulting in a grade of very good. In addition, large gains were also observed between 1985 and 2003. Seagrasses have increased in multiple locations, with large areas including west of Numbaa Island and Billys Island, and to the east of Old Man Island. This increasing trend in such a valuable habitat is a positive sign for the estuary.

**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 reestablishing 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 increased by 7% between 2003 and 2010, which continues the increasing mangrove distribution trend identified between 1985 and 2003. This increase has primarily occurred along the southern side of Bevan Island and northern side of Mangrove Island. Some of this increase would be a result of initiatives to re-establish mangroves along eroding foreshores and is a positive sign for estuary health.

**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 an endangered ecological community under the Threatened Species Conservation Act 1995. Declines in recent years have been linked to both increased sedimentation from catchment land use pressures and sea level rise.

Saltmarsh in the Shoalhaven River increased by 3% between 2003 and 2010 and therefore received a grade of good. This is in addition to a 33% increase observed between 1985 to 2003. This increase has occurred primarily to the north of Comerong Island Reserve, to the south of Comerong Island, on the southern side of Bevan Island, and the south eastern side of Apple Orchard Island and is a positive sign for estuary health.

*Note:* Analysis of change in extent of estuarine vegetation was completed using two different aerial photo interpretation methodologies for the 1985 and 2006 surveys. As a result, some of the change observed may be due to the different methodologies, as well as actual losses and gains in vegetation extent.