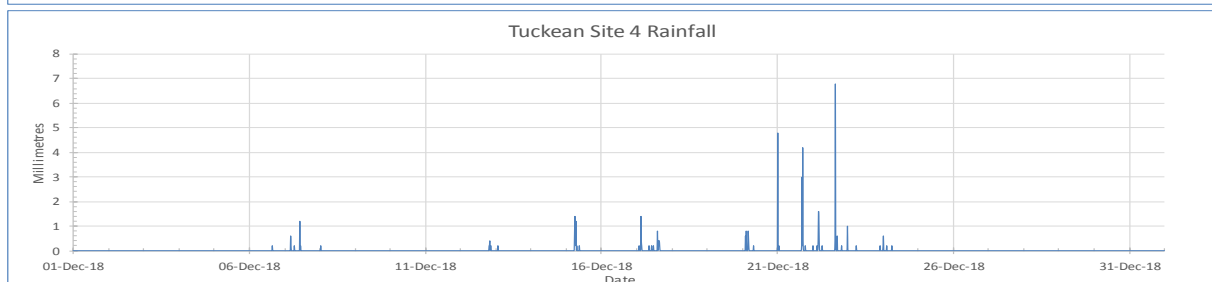
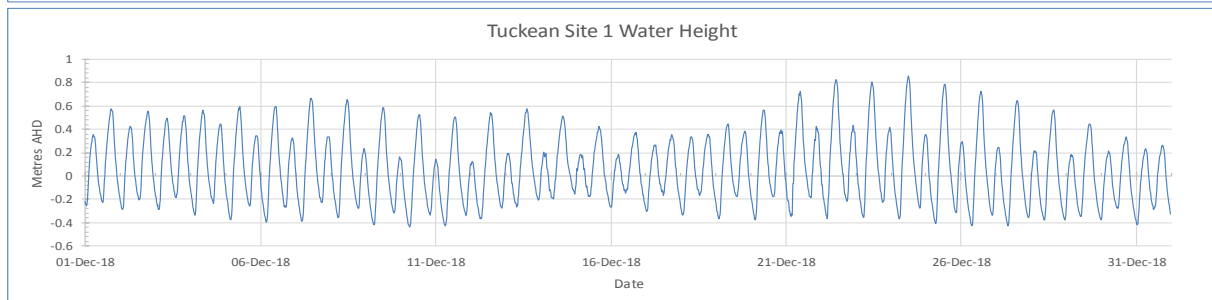
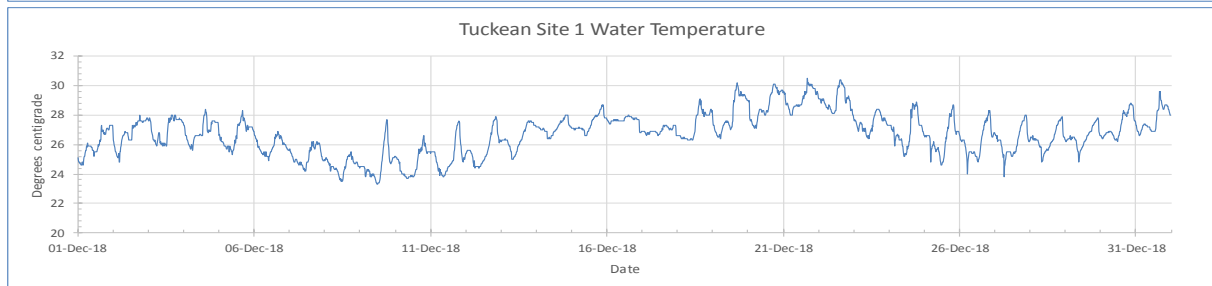
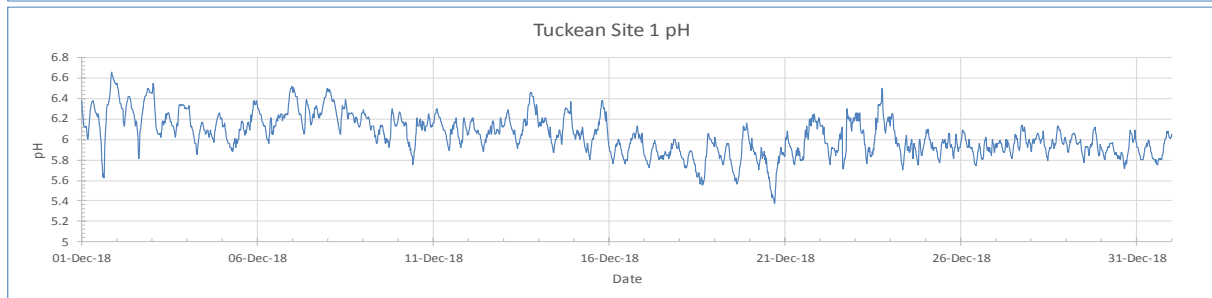
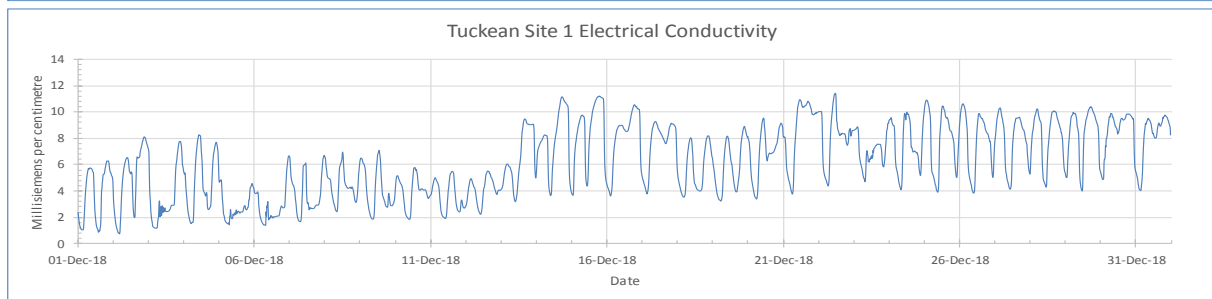
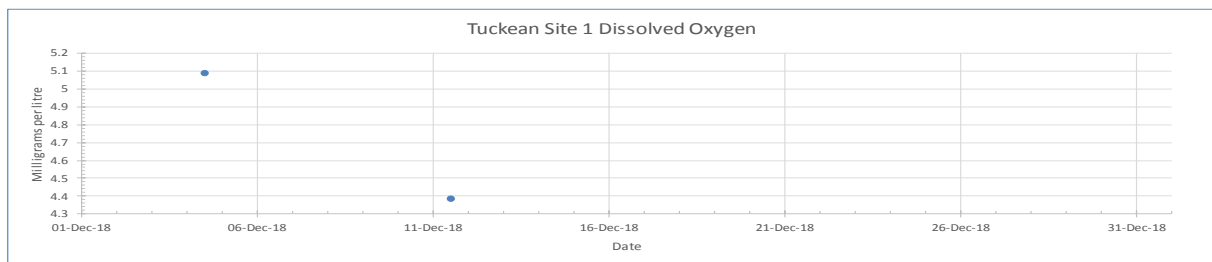


## Tuckean Site 1 water quality – December 2018

Data logger located at Bagotville in the Broadwater downstream from Bagotville Barrage



## Interpretation

Note: - Dissolved oxygen readings are being substituted by weekly manual measurements.

- **Dissolved oxygen (DO)** was recorded twice in December by weekly manual measurement on the upstream side of the barrage between 4.4 and 5.1 mg/L with an average of 4.8 which has decreased compared to the November average of 5.2. Levels below 3 mg/L are considered critical to fish, while between 3 and 6 mg/L is considered marginal and above 6 mg/L is optimal. DO is influenced by temperature, rainfall, tidal movement and chemical and biological oxygen demand.
- **Electrical conductivity (EC)** for December ranged between 0.77 and 11.43 ms/cm<sup>3</sup> and averaged 5.16 ms/cm, which is considered saline and has increased compared to the November fresh average of 0.92. Levels below 1.8 ms/cm are considered freshwater, while from 1.8 to 4.8 is considered brackish and above 4.8 ms/cm saline with seawater equal to approximately 60 ms/cm. EC is influenced by rainfall, runoff, temperature and tidal movement.
- **pH** for December ranged from 5.4 to 6.6 and averaged 6.1, which is acid and has increased by 0.7 equivalent to five times decreased acidity when compared to the November average readings of 5.4. River water under normal conditions is generally near neutral (pH 7), while brackish or saline water moving upstream during dry periods may be higher. Acid water is normally discharged from the Tuckean drains following rain. pH is measured on a logarithmic scale with each consecutive whole number different by a factor of 10.
- **Water temperature** for December ranged from 23.5° to 30.5°C giving a range of 7.0°C and averaging 26.4°C which has risen by 1.5° compared to the November average of 24.9° due to seasonal change. Water temperature is influenced by season, air temperature, solar radiation, cloud cover, day/night, turbidity, tidal movement and rainfall.
- **Water height** was recorded for December between -0.44 m and +0.85 metres giving a range of 1.29 m and averaging +0.06 m which has fallen by 0.02 m when compared to the November average of +0.08 m, however the logger needs to be surveyed into AHD. The highest tides of the month at 1.93 m occurred on 24<sup>th</sup> at 10:15 am at Evans Head, while the corresponding peak at the logger of 0.85m AHD occurred at 12:00 pm on 24<sup>th</sup> giving a delay of 1hr 45 min. Zero AHD approximates to mean sea level or a 0.925 m tide height therefore 1.93 m tide = 1.005m AHD. Water height can be affected by river level, tides and rainfall and to a lesser extent temperature, wind and barometric pressure.
- **Rainfall:** In December the site 4 data logger situated 4 km to the north recorded 46.2 mm over 12 days which compares to 45.8 mm recorded over 8 days in November. Peak 15-minute rainfall of 6.8 mm was recorded between 3:15 pm and 3:30 pm on 22<sup>nd</sup> December. The December 32 year average for this location is 132.1 mm therefore rainfall is well below average. During December the Rocky Mouth Creek data logger located 19 km to the SSW recorded 80.2 mm over 19 days, while the Ballina AWS located 19 km to the NE recorded 36.6 mm over 11 days.