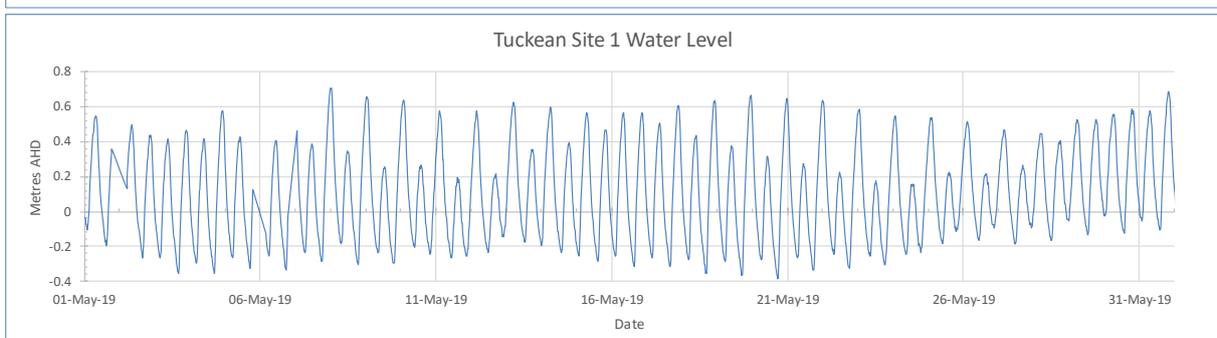
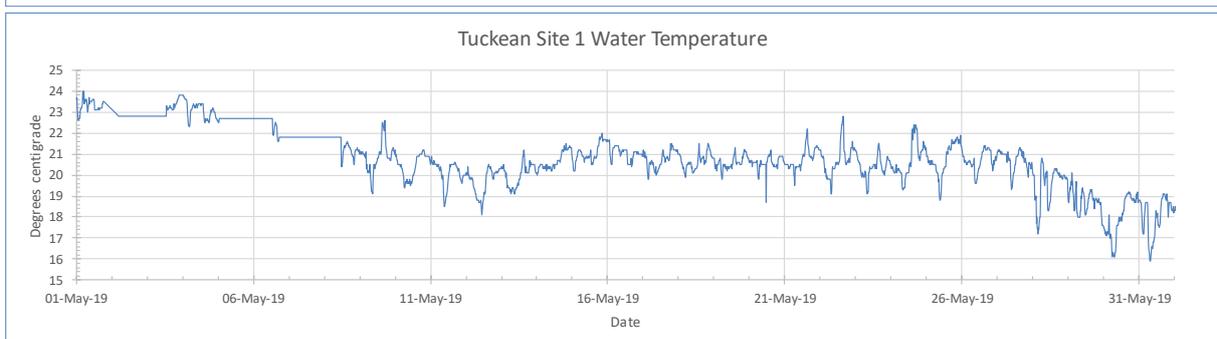
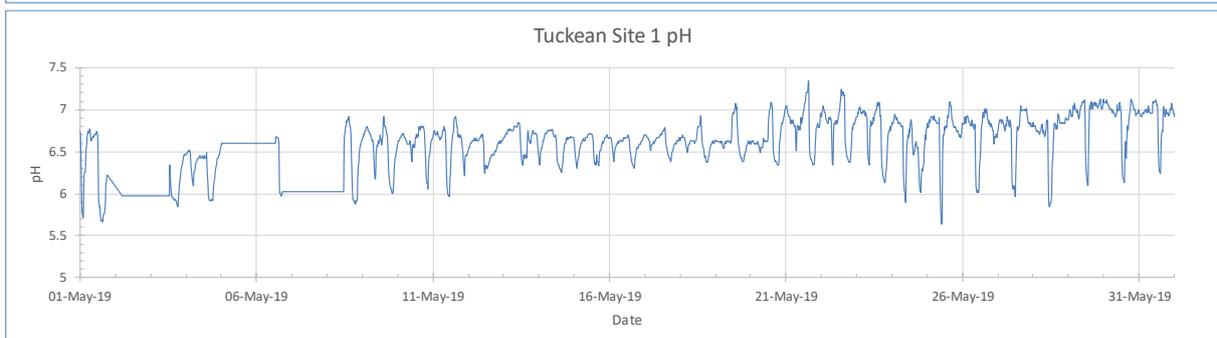
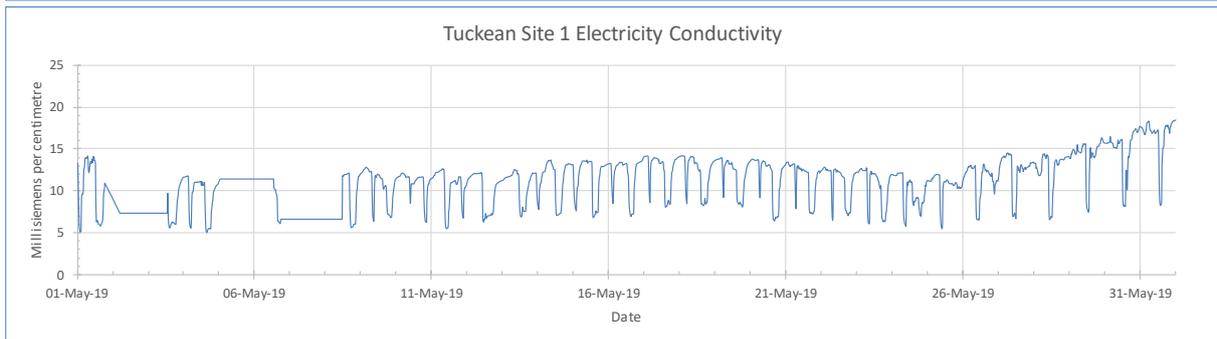
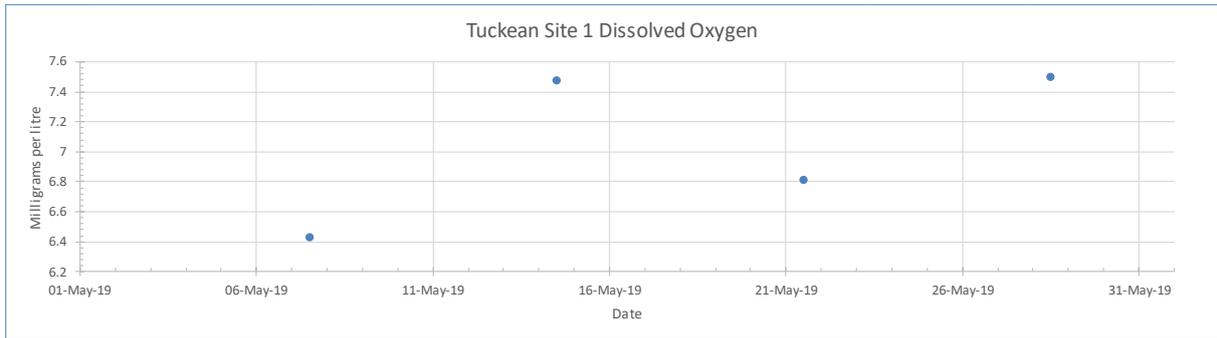
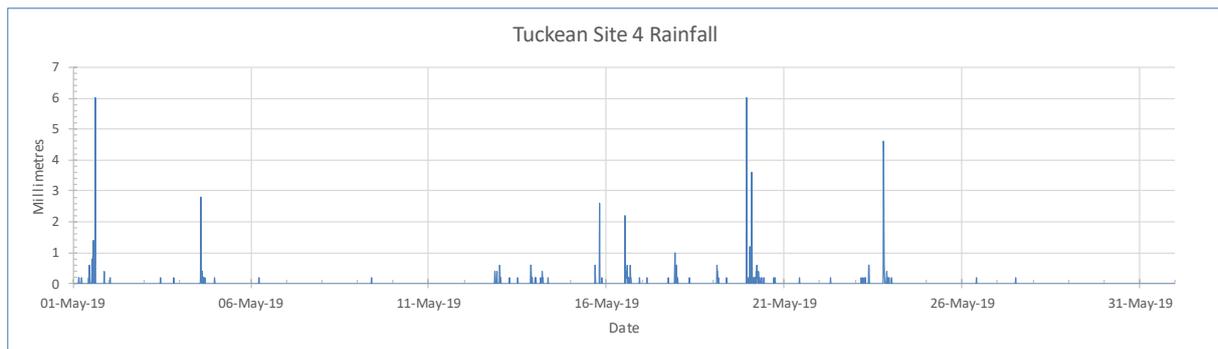


Tuckean Site 1 water quality – May 2019

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





Interpretation

Note: - Dissolved oxygen readings are being substituted by weekly manual measurements. Site 1 was cleaned and calibrated on 20th May and a new battery was installed to overcome dropouts at night.

- Dissolved oxygen (DO)** was recorded in May by weekly manual measurement on the upstream side of the barrage between 6.4 and 7.5 mg/L with an average of 7.1 mg/L which has increased by 1.2 mg compared to the April average of 5.9 mg/L. Readings are spot readings and do not take into account tidal variations which can cause DO to fall at low tide as drains discharge. 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 May ranged between 5.0 and 18.1 ms/cm³ and averaged 11.3 ms/cm, which is considered saline and has increased by 1.3 compared to the April saline average of 10.0 due to reduced rainfall and increasing tidal exchange. 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 May ranged from 5.6 to 7.3 and averaged 6.6, which is acid and has increased by 0.5 representing 3.16 times less acidity when compared to the April average readings of 6.1. 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 May ranged from 15.9° to 23.9°C giving a range of 8.0°C and averaging 20.7°C which has decreased by 3.1° compared to the April average of 23.8° due to decreasing air temperature and 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 May between -0.38 m and +0.68 metres giving a range of 1.06 m and averaging +0.12 m which is equal to the April average of +0.12 m, however the logger needs to be surveyed into AHD. The highest tides of the month at 1.84 m occurred on 19th at 9:02 pm at Ballina, while the corresponding peak at the logger of 0.67 m AHD occurred at 11:00 pm on 19th giving a delay of 1hr 58 min. Zero AHD approximates to mean sea level or a 0.925 m tide height therefore 1.84 m tide equals 0.915 m AHD, however tidal water cannot get in fast enough and without sufficient river flow, water cannot back up to this height. Water height can

be affected by river level, tides, storm surge and rainfall and to a lesser extent temperature, wind and barometric pressure.

- **Rainfall:** In May the site 4 data logger situated 4 km to the north recorded 68.8 mm over 21 days, which compares to 164.6 mm recorded over 23 days in April. Peak 15-minute rainfall of 6.0 mm was recorded between 10:15 pm and 10:30 pm on 19th May. The May 33-year average for this location is 152.5 mm therefore rainfall is well below average. During May the Rocky Mouth Creek data logger located 19 km to the SSW recorded 49.0 mm over 23 days, while the Ballina AWS located 19 km to the NE recorded 94.0 mm over 17 days.