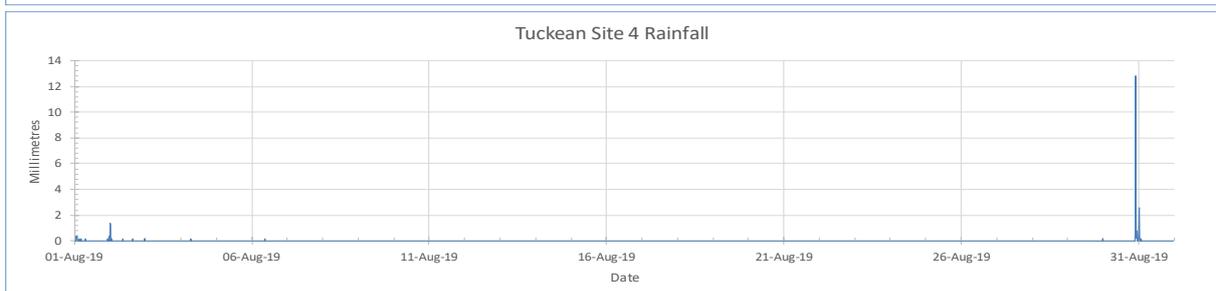
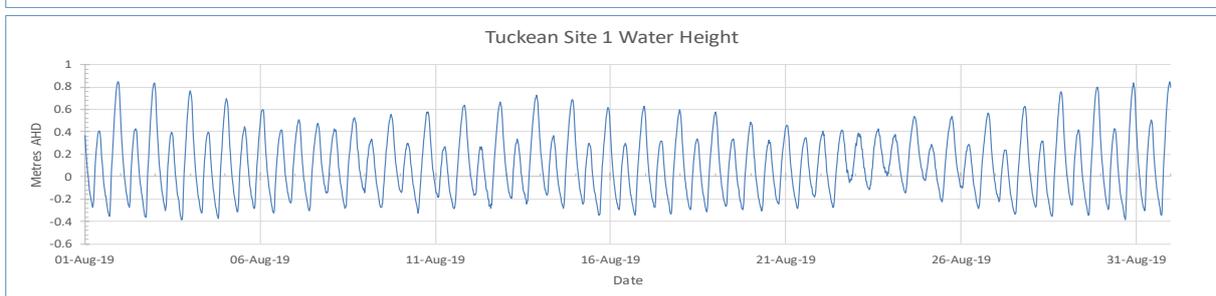
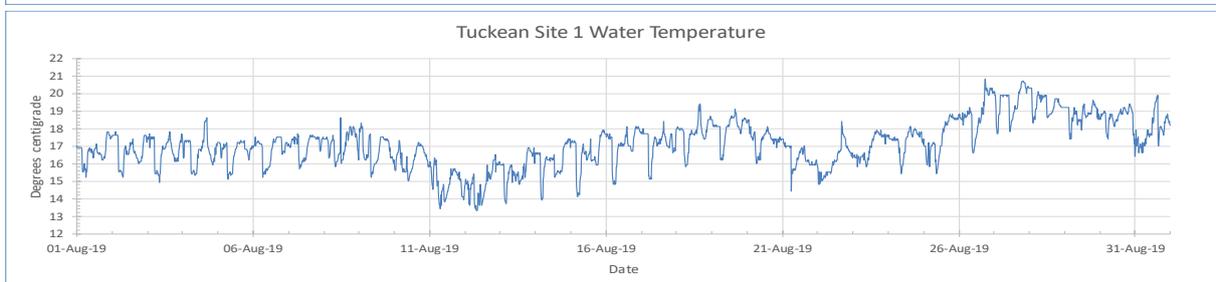
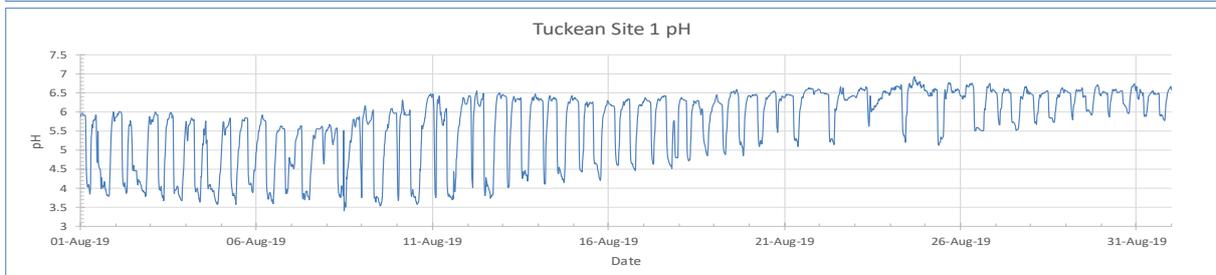
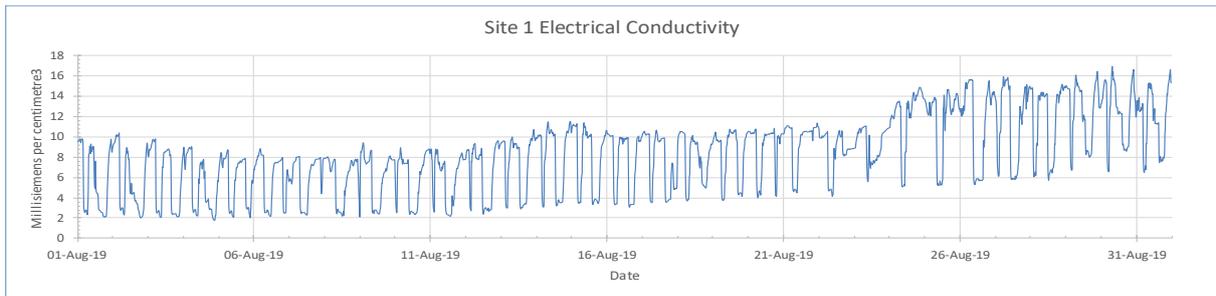
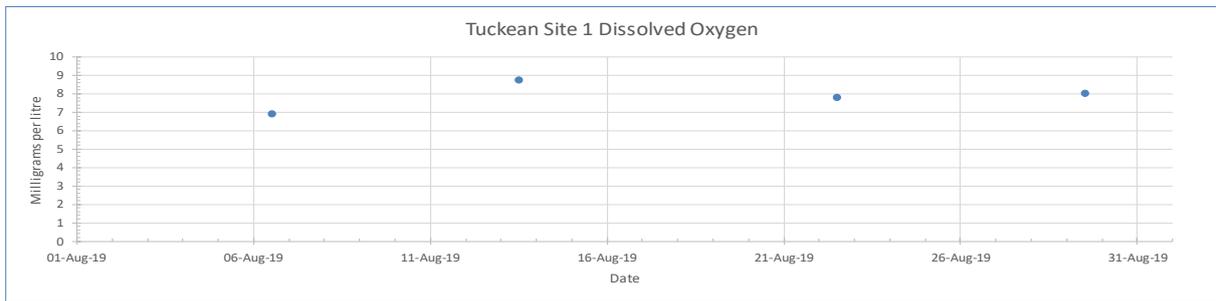


Tuckean Site 1 water quality – August 2019

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 8th August.

- **Dissolved oxygen (DO)** was recorded in August by weekly manual measurement on the upstream side of the barrage between 7.0 and 8.9 mg/L with an average of 8.0 mg/L which has increased by 1.2 mg compared to the July average of 6.8 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 August ranged between 1.8 and 16.7 ms/cm³ and averaged 8.34 ms/cm, which is considered saline and has increased by 7.09 compared to the July freshwater average of 1.25. EC rose throughout August due to reduced rainfall and increasing tidal influence. 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 August ranged from 3.4 to 6.9 and averaged 5.7, which is acid and has increased by 2.0 representing 100 times decreased acidity when compared to the July average readings of 3.7. pH fell at the start of August due to rainfall causing a discharge of acid water then rose with reduced rainfall. River water under normal conditions is generally near neutral (pH 7), while brackish or saline water moving upstream during dry periods will 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 August ranged from 13.3° to 20.8°C giving a range of 7.5°C and averaging 17.1°C which has increased by 1.7° compared to the July average of 15.4° due to increasing 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 August between -0.38 m and +0.85 metres giving a range of 1.23 m and averaging +0.12 m which is 0.03 m lower than the July average of +0.15 m, however the logger needs to be surveyed into AHD. The highest tides of the month at Ballina of 1.91 m occurred on 1th August at 8:47 pm and 2nd August at 9:35 pm, while the corresponding peak at the logger of 0.848 m AHD occurred at 10:30 pm on 1st and 0.838m at 11:30pm on 2nd giving a delay of 1hr 43 min and 1hr 55 min respectively. Zero AHD approximates to mean sea level or a 0.925 m tide height therefore a 1.91 m tide equals 0.985 m AHD, however tidal water cannot get in fast enough during the tidal cycle 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 August the site 4 data logger situated 4 km to the north recorded 30.4 mm over 6 days which compares to 92.6 mm recorded over 18 days in July. Peak 15-minute rainfall of 12.8 mm was recorded between 10:00 pm and 10:15 pm on 30th August during a thunder storm. The August 33-year average for this location is 74.1 mm therefore monthly rainfall is below average. During August the Rocky Mouth Creek data logger located 19 km to the SSW recorded 19.2 mm over 11 days, while the Ballina AWS located 19 km to the NE recorded 52.0 mm over 5 days.