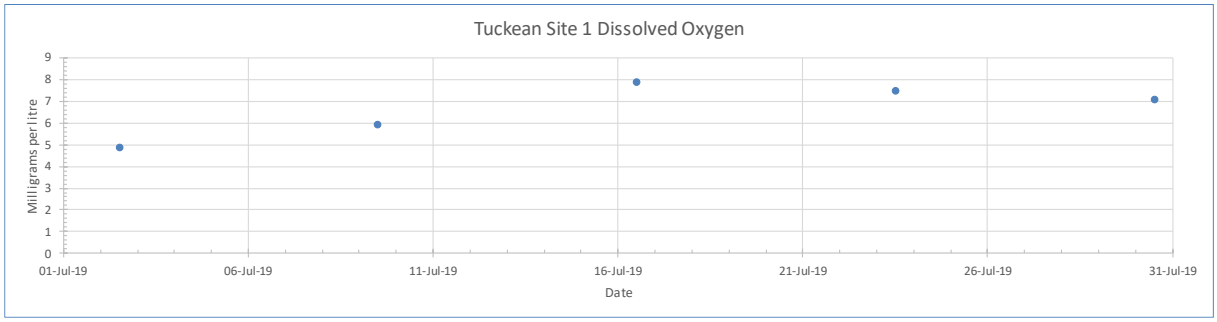
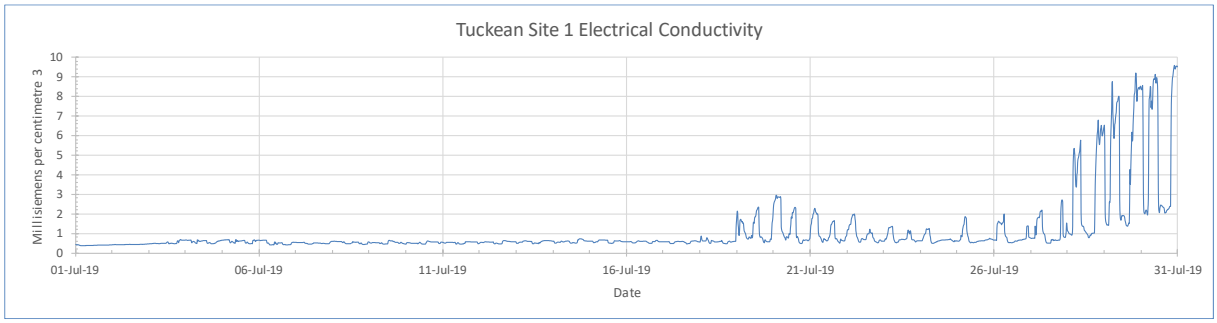
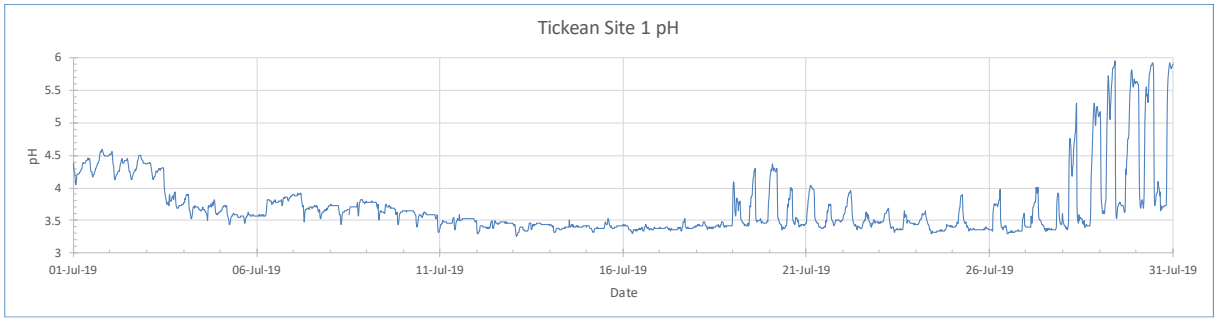
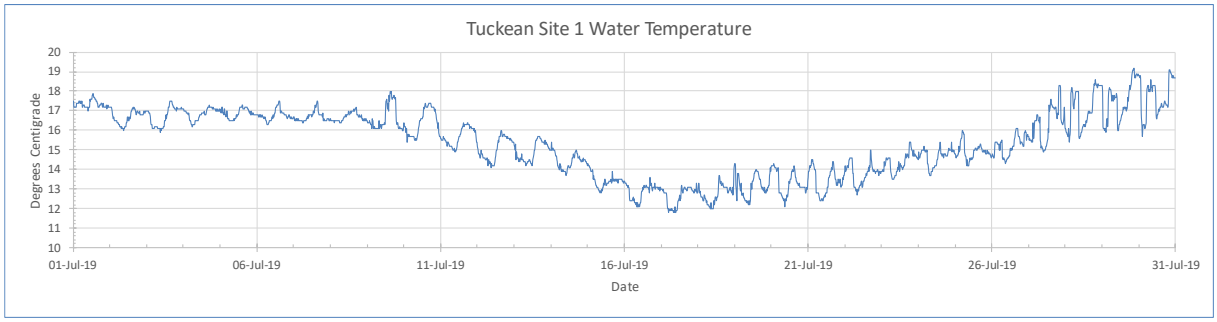
Tuckean Site 1 water quality – July 2019

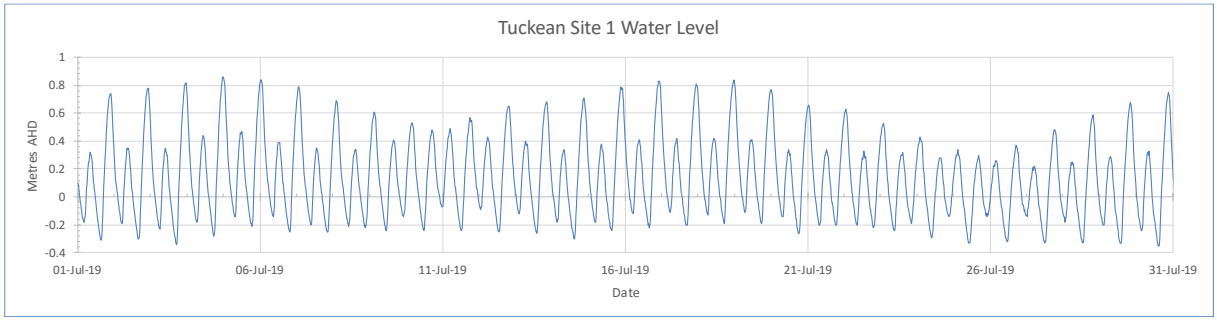
Data logger located at Bagotville in the Broadwater downstream from Bagotville Barrage

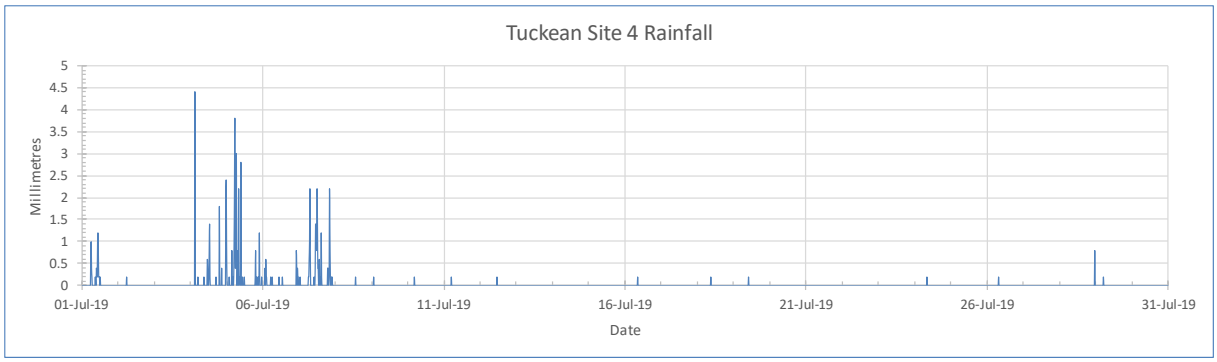












Interpretation

Note: - Dissolved oxygen readings are being substituted by weekly manual measurements. Site 1 was cleaned and calibrated on 8th July.

- **Dissolved oxygen (DO)** was recorded in July by weekly manual measurement on the upstream side of the barrage between 5.0 and 8.0 mg/L with an average of 6.8 mg/L which has decreased by 0.5 mg compared to the June average of 7.3 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 July ranged between 0.4 and 20.2 ms/cm^3 and averaged 1.25 ms/cm, which is considered freshwater and has decreased by 10.25 compared to the June saline average of 11.5. EC fell following above average rainfall in June and July generating fresh water runoff. 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 July ranged from 3.3 to 6.0 and averaged 3.7, which is acid and has decreased by 2.5 representing 316 times increased acidity when compared to the June average readings of 6.2. pH fell due to above average rainfall during June and July which caused minor flooding and the discharge of acid water from drains. 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 July ranged from 11.9^o to 19.2^{o}C giving a range of 7.3^{o}C and averaging 15.4^{o}C which has decreased by 1.8^0 compared to the June average of 17.2^0 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 July between -0.34 m and +0.86 metres giving a range of 1.20 m and averaging +0.15 m which is 0.04 lower than the June average of +0.19 m, however the logger needs to be surveyed into AHD. The highest tides of the month at 1.93 m occurred on 4th July at 9:52 pm at Ballina, while the corresponding peak at the logger of 0.858 m AHD occurred at 11:15 pm on 4th giving a delay of 1hr 23 min. Zero AHD approximates to mean sea level or a 0.925 m tide height therefore 1.93 m tide equals 1.005 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 July the site 4 data logger situated 4 km to the north recorded 92.6 mm over 18 days which compares to 214.4 mm recorded over 21 days in June. Peak 15-minute rainfall of 4.4 mm was recorded between 2:30 am and 2:45 am on 4th July. The July 33-year average for this location is 79.4 mm therefore rainfall is above average for the second time this year. During July the Rocky Mouth Creek data logger located 19 km to the SSW recorded 69.8 mm over 21 days, while the Ballina AWS located 19 km to the NE recorded 74.8 mm over 14 days.

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