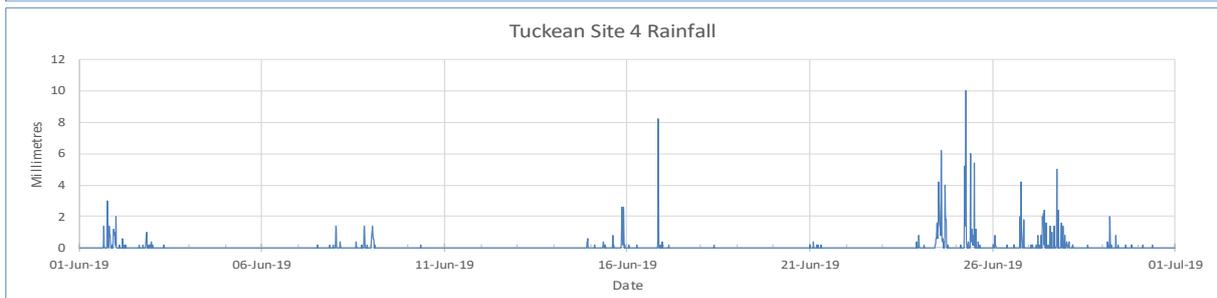
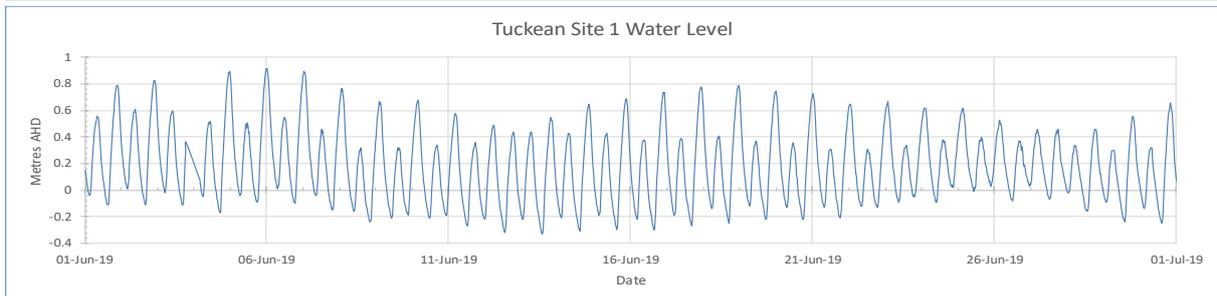
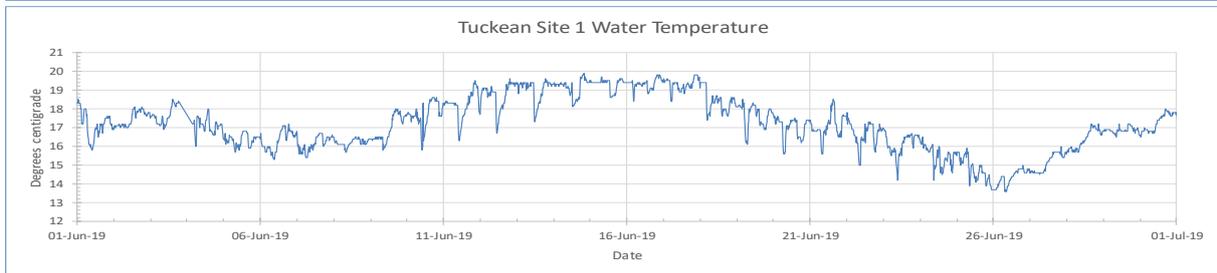
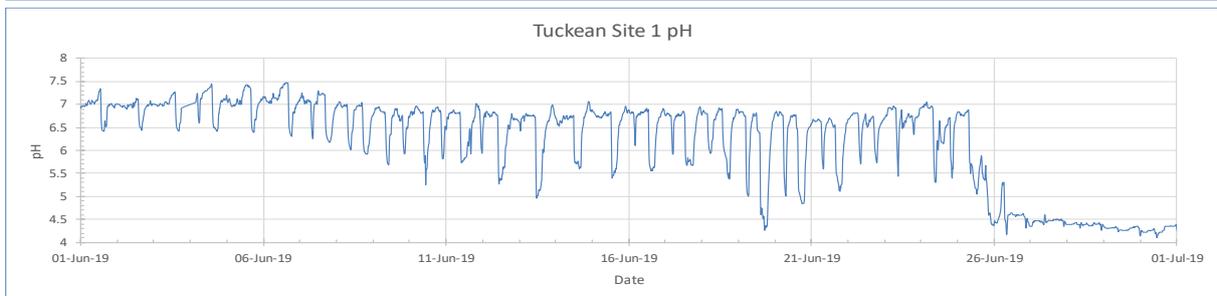
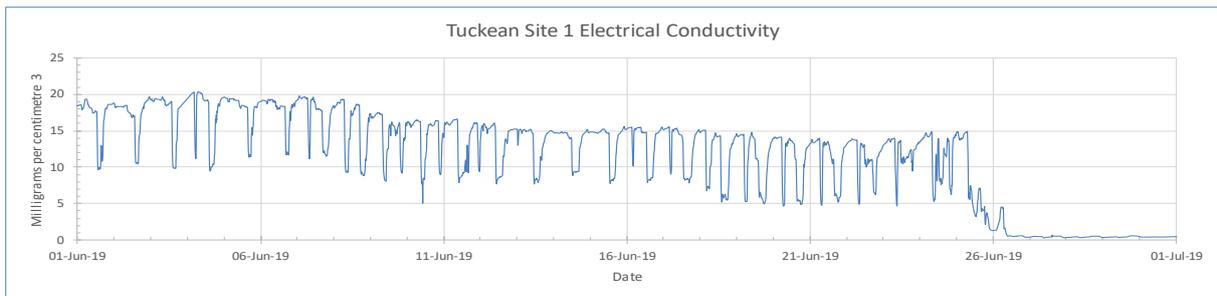
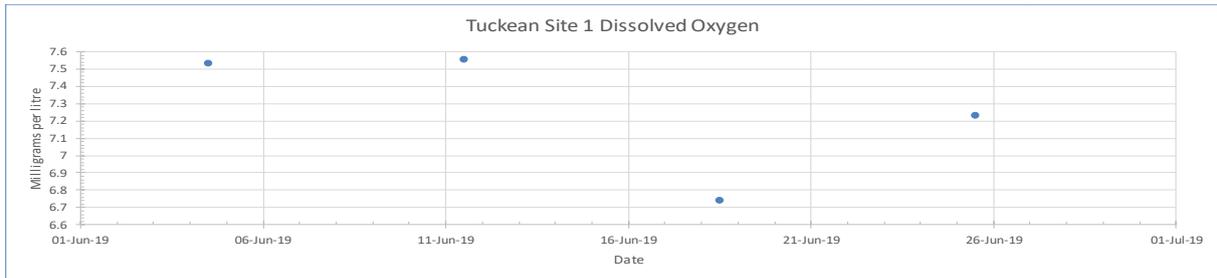


Tuclean Site 1 water quality – June 2019

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 10th June.

- **Dissolved oxygen (DO)** was recorded in June by weekly manual measurement on the upstream side of the barrage between 6.7 and 7.6 mg/L with an average of 7.3 mg/L which has increased by 0.2 mg compared to the May average of 7.1 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 June ranged between 0.4 and 20.2 ms/cm³ and averaged 11.5 ms/cm, which is considered saline and has increased by 0.2 compared to the May saline average of 11.3. EC fell from 25th June due to fresh water runoff generated by rainfall. 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 June ranged from 5.6 to 7.3 and averaged 6.2, which is acid and has decreased by 0.1 representing 1.26 times more acidity when compared to the May average readings of 6.3. pH fell at the end of the month as rainfall resulted in 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 June ranged from 13.6° to 19.7°C giving a range of 6.1°C and averaging 17.2°C which has decreased by 3.5° compared to the May average of 20.7° 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 June between -0.33 m and +0.88 metres giving a range of 1.21 m and averaging +0.19 m which is 0.07 higher than the May average of +0.12 m, however the logger needs to be surveyed into AHD. The highest tides of the month at 1.88 m occurred on 5th at 10:05 pm at Ballina, while the corresponding peak at the logger of 0.92 m AHD occurred at 11:30 pm on 5th giving a delay of 1hr 25 min. Zero AHD approximates to mean sea level or a 0.925 m tide height therefore 1.88 m tide equals 0.955 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 June the site 4 data logger situated 4 km to the north recorded 214.4 mm over 21 days which compares to 68.8 mm recorded over 21 days in May. Peak 15-minute rainfall of 10.0 mm was recorded between 6:15 am and 6:30 am on 25th June. The June 33-year average for this location is 165.5 mm therefore rainfall is above average for the first time in eight months. During June the Rocky Mouth Creek data logger located 19 km to the SSW recorded 191.0 mm over 24 days, while the Ballina AWS located 19 km to the NE recorded 268.2 mm over 15 days.