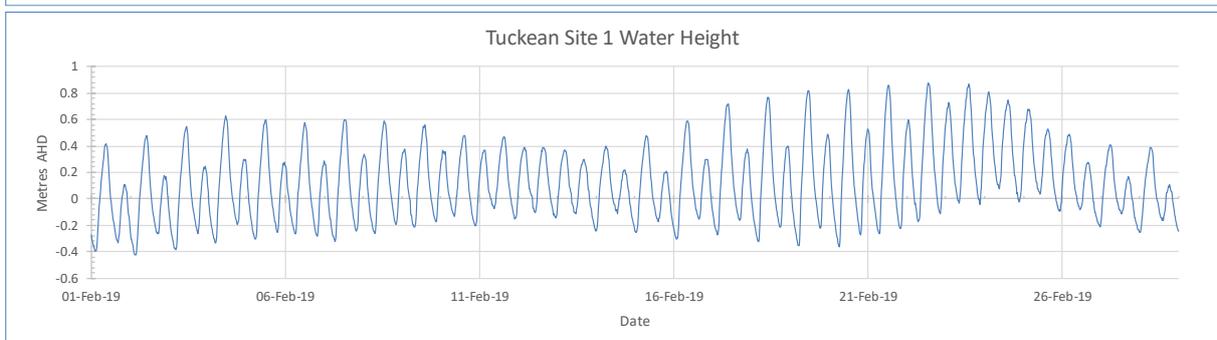
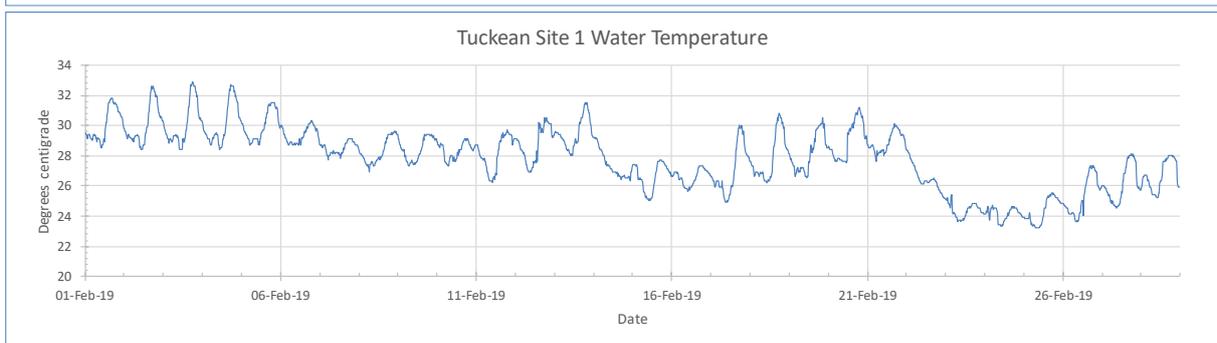
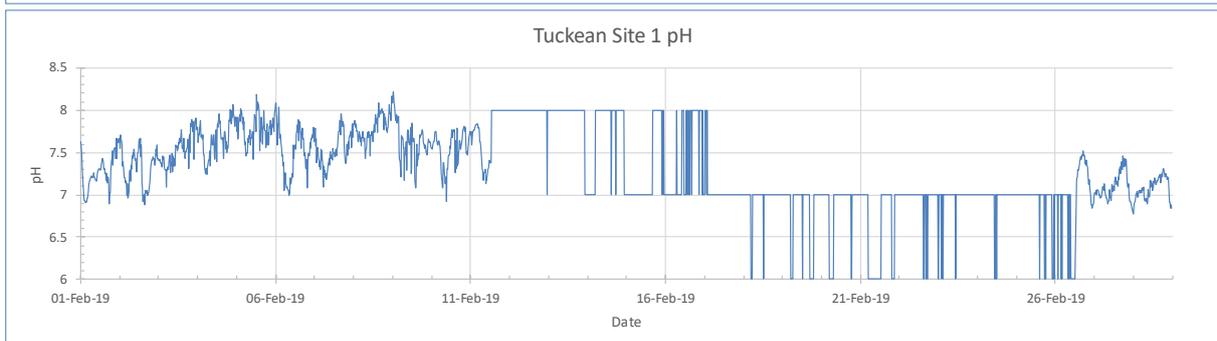
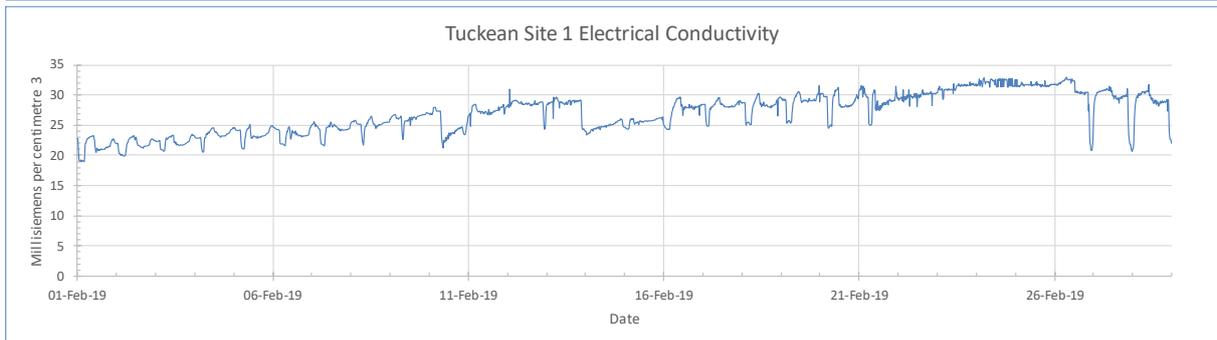
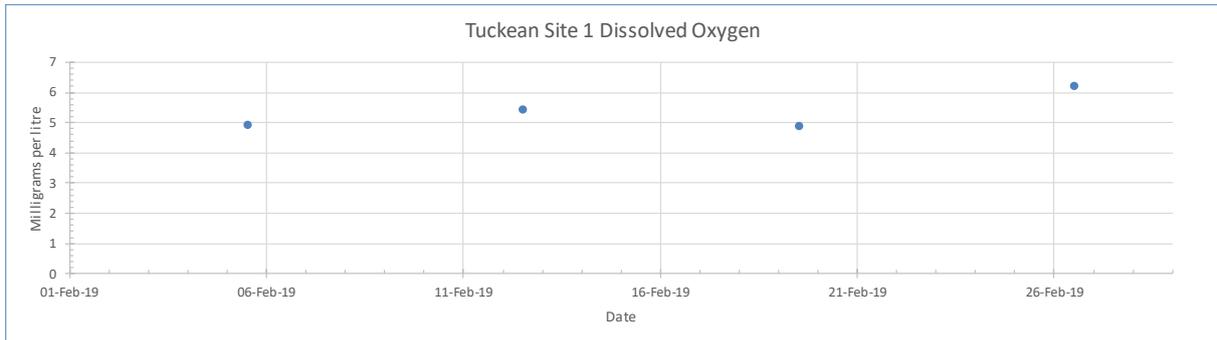
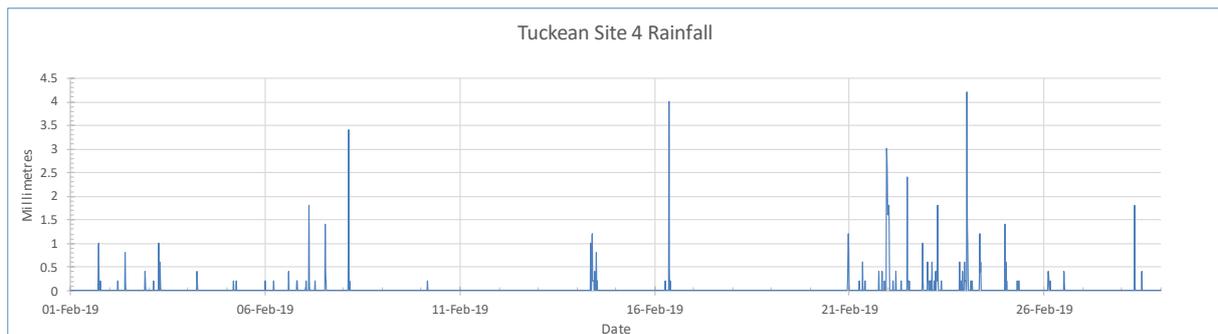


Tuckean Site 1 water quality – February 2019

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 11th and 26th, the pH sensor failed to calibrate on 11th, a new sensor was ordered and installed on 26th. There was unreliable EC data between February 23 and February 28th.

- Dissolved oxygen (DO)** was recorded in February by weekly manual measurement on the upstream side of the barrage between 4.95 and 6.29 mg/L with an average of 5.4 which has increased compared to the January average of 4.7. 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 February ranged between 19.05 and 32.46 ms/cm³ and averaged 26.90 ms/cm, which is considered saline and has increased by 3.74 compared to the January saline average of 23.16 due to low rainfall, increased tidal exchange and storm surge. 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 February ranged from 6.8 to 8.2 and averaged 7.3, which is alkaline and has increased when compared to the January average readings of 6.8, however the sensor would not calibrate and gave false readings between 11th and 26th. 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 February ranged from 23.2° to 32.6°C giving a range of 9.4°C and averaging 27.8°C which has decreased by 1.3° compared to the January average of 29.1° due to a fall in temperature in late February due to cyclone Oma. Water temperature is influenced by season, air temperature, solar radiation, cloud cover, day/night, turbidity, tidal movement and rainfall.
- Water height** was recorded for February between -0.36 m and +0.86 metres giving a range of 1.22 m and averaging +0.13 m which has risen by 0.09 m when compared to the January average of +0.04 m due to storm surge from cyclone Oma, however the logger needs to be surveyed into AHD. The highest tides of the month at 1.85 m occurred on 20th at 8:48 am at Ballina, while the corresponding peak at the logger of 0.83m AHD occurred at 11:45 pm on 20th giving a delay of 2hr 57 min. Zero AHD approximates to mean sea level or a 0.925 m tide height therefore 1.85 m tide = 0.925m AHD however this was compounded by storm surge. 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 February the site 4 data logger situated 4 km to the north recorded 79.0 mm over 19 days which compares to 12.2 mm recorded over 1 day in January. Rainfall included 47.6 mm from cyclone Oma in the last week of February. Peak 15-minute rainfall of 4.2 mm was recorded between 12:00 am and 12:15 am on 24th February. The February 33-year average for this location is 176.5 mm therefore rainfall is well below average. During February the Rocky Mouth Creek data logger located 19 km to the SSW recorded 54 mm over 16 days, while the Ballina AWS located 19 km to the NE recorded 70.2 mm over 18 days.