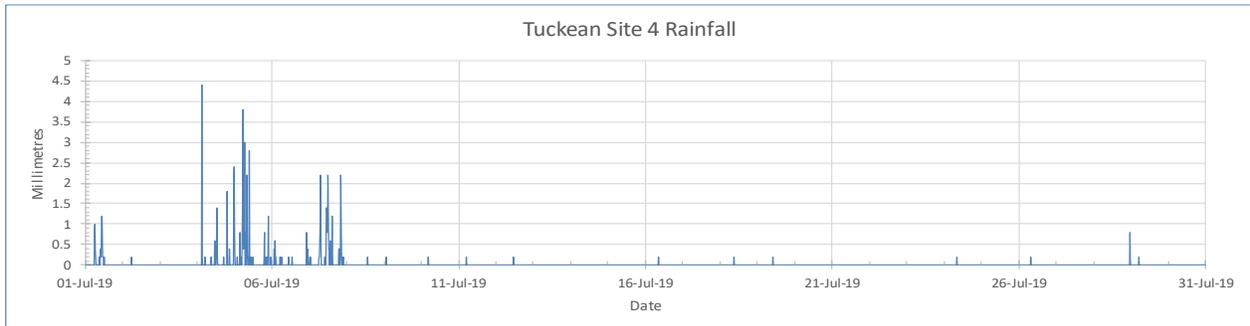
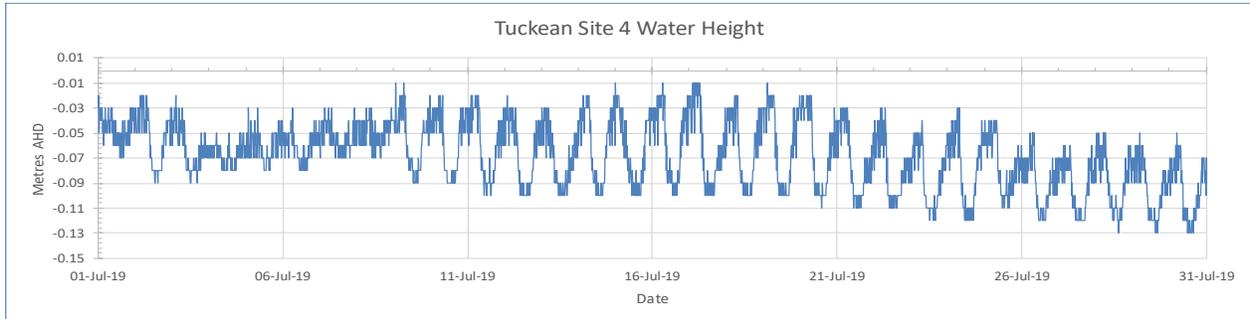
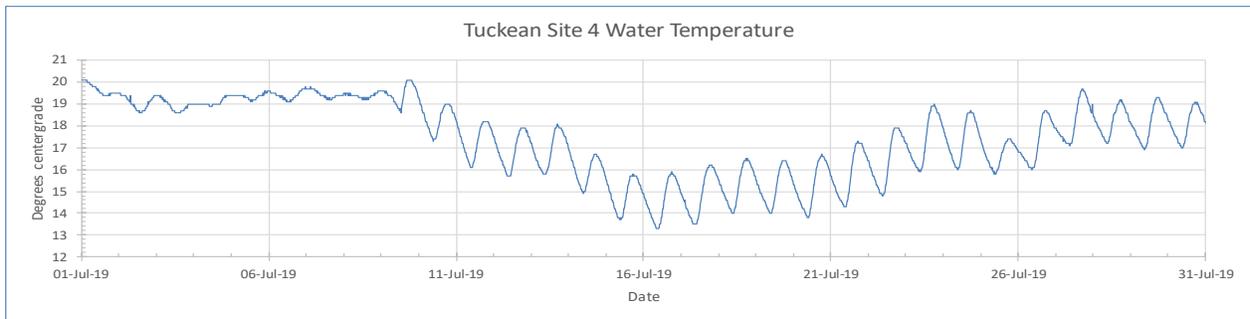
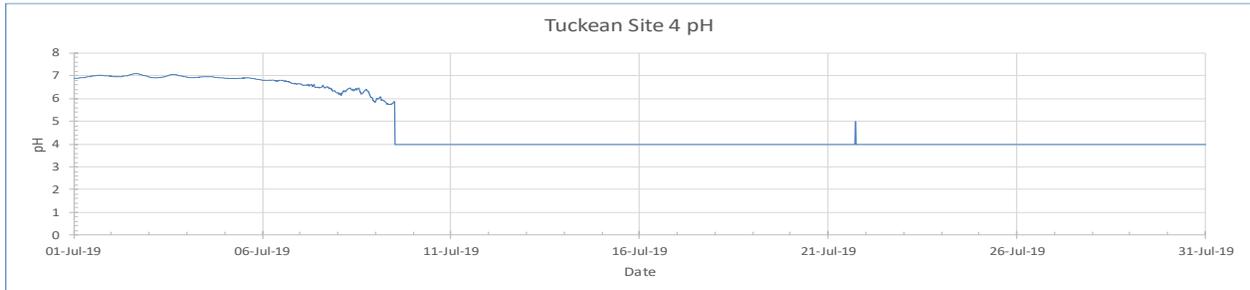
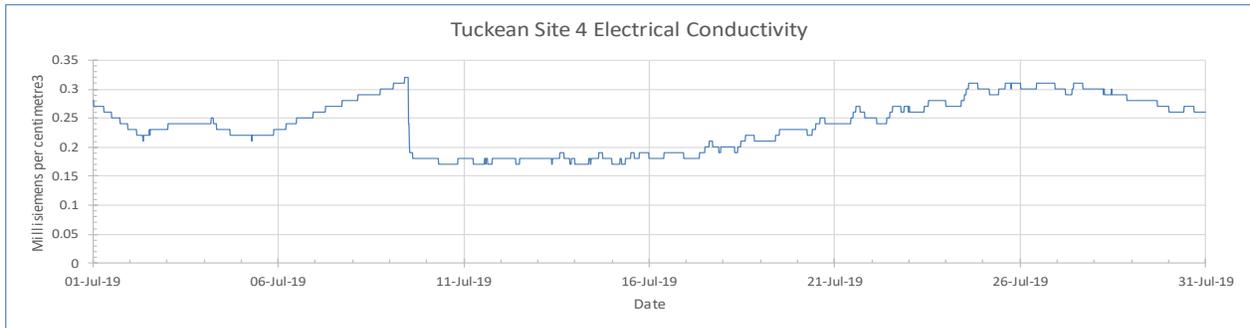


# Tuckean site 4 water quality – July 2019

Data logger located in Tuckean Swamp, Northern NSW



## Interpretation

Note – Site 4 EC sensor was replaced and calibrated on 9<sup>th</sup> July however pH failed to calibrate after several cycles and was replaced on 1<sup>st</sup> August. Temperature was reading 10 deg C low so has been adjusted.

**Electrical conductivity (EC)** was recorded in July between 0.17 and 0.32 millisiemens per cubic centimetre (ms/cm<sup>3</sup>) averaging 0.24 ms which compares to the June average of 0.27 ms however the EC sensor had failed to calibrate and was replaced on 9<sup>th</sup>. EC measures the ability of the water to conduct an electric current, which is the inverse of electrical resistance (R expressed in ohms) and is affected by rain and runoff, acid water, tidal brackish water and temperature.

**pH** failed to calibrate and appears to be higher than expected therefore no reliability can be placed on the data. The pH sensor was replaced on 1<sup>st</sup> August and calibrated OK but the meter is again returning incorrect data and may require replacing. Above average rainfall during June and the first half of July caused minor flooding and allowed runoff of acidity downstream dropping pH at site 2 and site 1. Peaks of pH normally occur in late afternoon as plants draw CO<sub>2</sub> from the water, while troughs occur in early mornings as plants respire CO<sub>2</sub> forming carbonic acid. pH is measured on a logarithmic scale, therefore each consecutive whole number below neutral represents 10 times the acidity than the previous number.

**Water temperature.** Water temperature for July ranged between 13.3 and 20.1<sup>o</sup>C with an average of 17.4 deg C which has increased by 0.3 <sup>o</sup>C compared to the June average of 17.1 deg C however the sensor was replaced on 9<sup>th</sup> which increased its response therefore no comparison can be made. Temperature variations are caused by season, time of day, solar radiation and air temperature, while cloud cover, rain and degree of shading also affect water temperature.

**Water level** was recorded for July between -0.13 and -0.01 m AHD giving a range of 0.12 m with a max daily tidal range of 0.09 m and average height of -0.07 m AHD, which has increased compared to the June average of -0.09m due to rainfall however the depth sensor did not appear to be responding correctly to increased levels so will need checking. Average water level at site 4 is 0.22 m lower than site 1 due to low yearly rainfall, evaporation, transpiration and the restricted entry of tidal water. For accuracy the depth sensor will need to be checked and resurveyed in to AHD. Rainfall, tidal fluctuations, river level, sluice gate opening, in stream vegetation, sediment build up and drain blocks and to a lesser extent temperature, wind and barometric pressure can all affect the water level.

**Rainfall:** In July the site 4 data logger 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 4<sup>th</sup> July. The July 33-year average for this location is 79.4 mm therefore monthly 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.