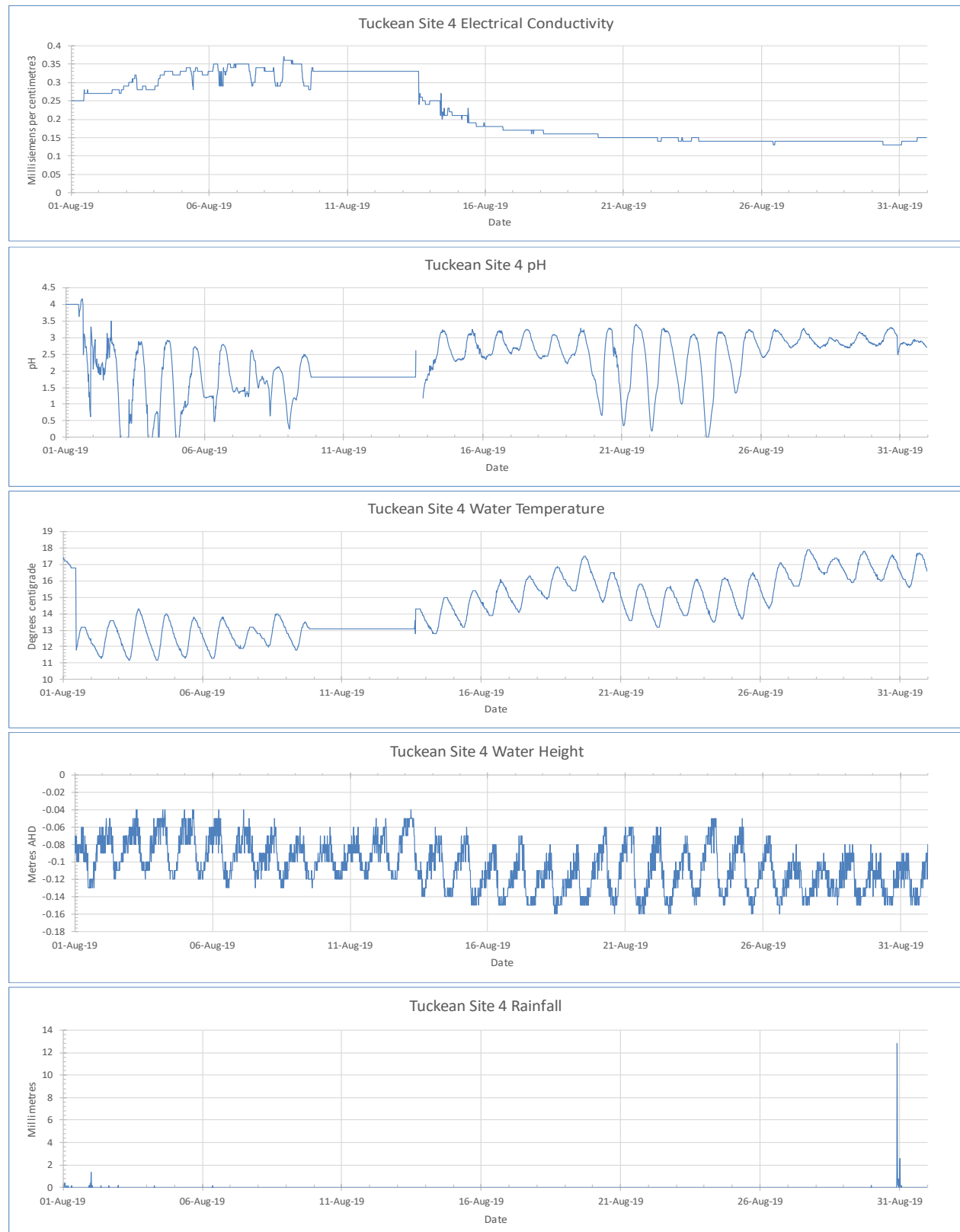


## Tuckean site 4 water quality – August 2019

Data logger located in Tuckean Swamp, Northern NSW



## Interpretation

Note – Site 4 pH sensor was replaced on 1<sup>st</sup> August and cleaned and calibrated, however pH dropped below normal levels indicating an error and the meter turned off on 9<sup>th</sup> and was turned back on and cleaned and calibrated again on 13<sup>th</sup> which improved the response. The water quality meter requires replacement due to unreliable EC and pH readings.

**Electrical conductivity (EC)** was recorded in August between 0.13 and 0.36 millisiemens per cubic centimetre (ms/cm<sup>3</sup>) averaging 0.22 ms which compares to the July average of 0.24 ms however the EC sensor had failed to calibrate at 0uS which may be due to iron residue which cannot be cleaned off. 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** appears to be lower 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 then and again on 13<sup>th</sup> but the meter is still returning low readings. However, pH levels are expected to be low at site 4 due high oxidation and runoff of concentrated acidity. 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 August ranged between 13.3 and 20.1<sup>0</sup>C with an average of 14.5 deg C which has fallen by 2.9 °C compared to the July average of 17.4 deg C however the sensor was replaced and recalibrated 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 August between -0.16 and -0.04 m AHD giving a range of 0.12 m with a max daily tidal range of 0.1 m and average height of -0.11 m AHD, which has decreased by 0.04 m compared to the July average of -0.07m due to lower 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 was 0.23 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 August the site 4 data logger 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 30<sup>th</sup> 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.