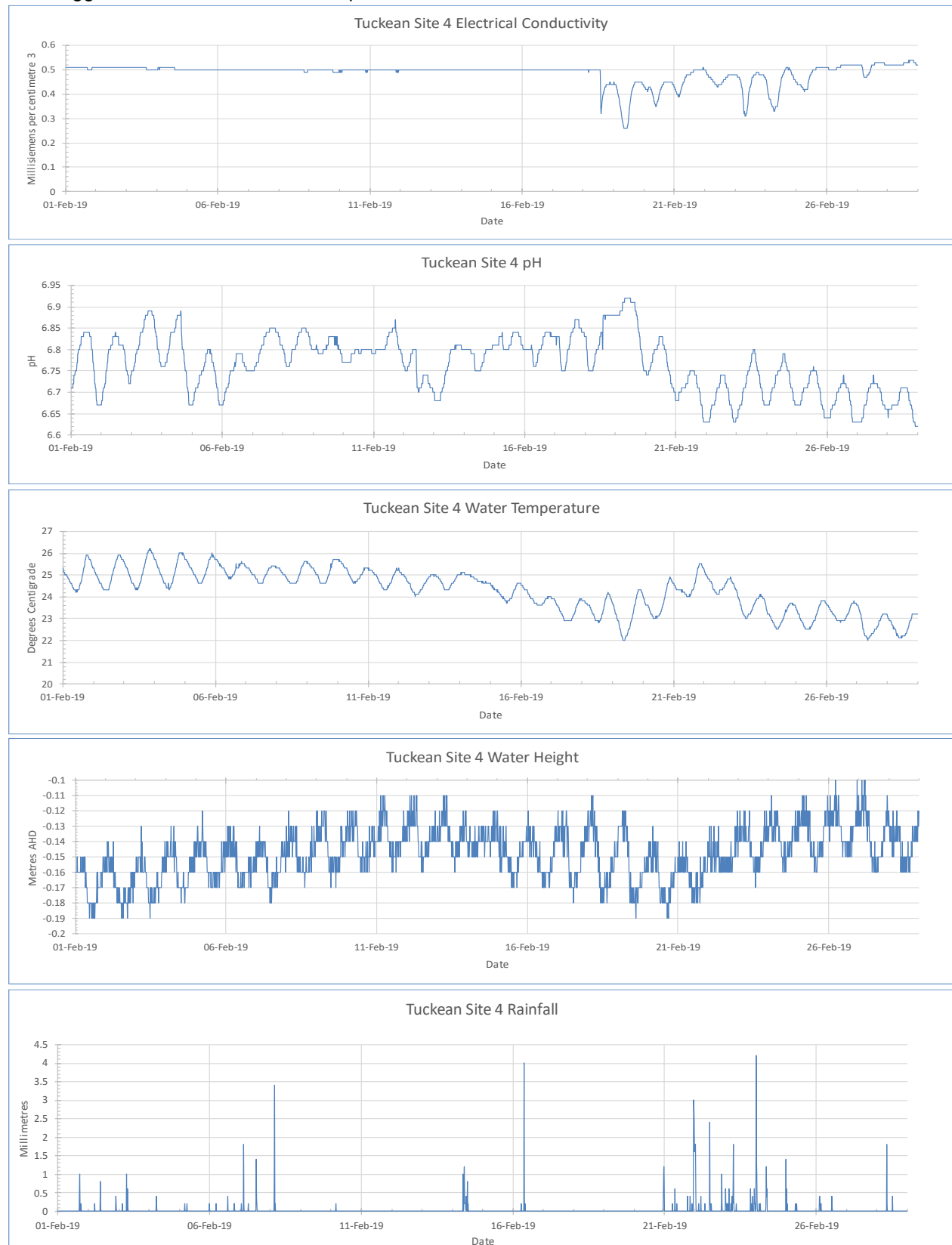


Tuckean site 4 water quality – February 2019

Data logger located in Tuckean Swamp, Northern NSW



Interpretation

Note – Site 4 was cleaned and calibrated on 18th February restoring EC response.

Electrical conductivity (EC) was recorded in February between 0.26 and 0.53 ms/cm³ averaging 0.49 which compares to the January average of 0.53 ms. 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 was recorded in February between 6.6 and 6.9 with an average of 6.8 which is equal to the January pH average of 6.8. Low rainfall, high transpiration and evaporation and restricted tidal entry have resulted in the lowest groundwater levels recorded over summer during the last 33 years. Falling groundwater exposes acid sulfate soils which oxidise, however during February drain levels higher than groundwater levels were prevented acid water from entering drains. Future rain may mobilise acidity and flush acid water into drains. Peaks of pH normally occur in late afternoon as plants draw CO₂ from the water, while troughs occur in early mornings as plants respire CO₂ forming carbonic acid. pH is measured on a logarithmic scale, therefore each consecutive whole number below neutral represents 10 times the acidity that the previous number.

Water temperature. Water temperature for February ranged between 22.0 and 26.1⁰C with an average of 24.3 deg C which has decreased by 1.4⁰C compared to the January average of 25.7 deg C due to cloud and rain from cyclone Oma. Temperature variations are caused by time of day affecting solar radiation and air temperature, while cloud cover, rain, degree of shading and season also affect water temperature.

Water level was recorded for February between -0.19 and -0.1 m AHD giving a range of 0.09 m with a max daily tidal range of 0.07 m and average height of -0.15 m AHD which is 0.01 m higher than the January average of -0.16m due to increased rainfall. Average water level at site 4 is 0.28 m lower than site 1 due to low rainfall, evaporation, transpiration and the restricted entry of tidal water. For accuracy the sensor will need to be 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 February the site 4 data logger 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.