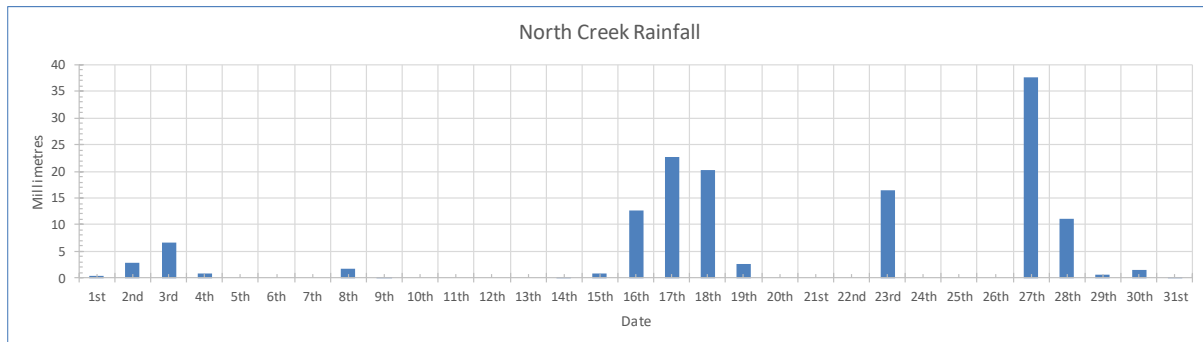


North Creek water quality – March 2019

Data logger located in North Creek near airport.



Interpretation

*Note – The unit was removed from North Creek on February 27th and sent to the manufacturer for calibration and repair on 1st March. The unit was received back on 29th March and is planned to be reinstalled on 4th April.

- **Dissolved oxygen* (DO)** for March was not recorded. 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, chemical and biological oxygen demand. DO at North Creek is negatively influenced by runoff from drains following rain.
- **Electrical conductivity (EC)** for March was not recorded. 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 equivalent to approximately 60 ms/cm. EC is influenced by rainfall, runoff, temperature and tidal movement.
- **pH** for March was not recorded. Peaks of pH normally occur on high tide with increasing salinity while troughs occur on low tide as acid drains discharge. River water under normal conditions is generally near neutral (pH 7), while saline water moving upstream during high tides will be higher. pH is measured on a logarithmic scale with each consecutive whole number different by a factor of 10.
- **Total dissolved solids (TDS)** is a measure of the combined content of all inorganic and organic dissolved molecular, ionized or suspended micro-granular substances in the water, including minerals, salts or metals measured in parts per thousand (ppt). TDS was not recorded in March. TDS is highest on high tide as salinity increases and lowest on low tide as freshwater is discharged from North Creek. TDS is influenced by tidal movement, rain and runoff.
- **Density** also called specific gravity (SG) is the ratio of the weight of a sample compared to that of fresh water at +4.0°C. For March density was not recorded. Fresh water is normally close to 1.0, while sea water is slightly denser at 1.027g/cm³, which leads to the formation of salt wedges and acid water is even denser (Sulfuric acid SG = 1.94 g/cm³). Density varies

with temperature with maximum density occurring at +4.0°C, while tides, rainfall, runoff and acid discharges also affect density.

- **Water temperature** for March was not recorded. Water temperature is influenced by season, air temperature, solar radiation, cloud cover, day/night, turbidity, tidal movement and rainfall.
- **Water height** was not recorded in March. The highest tide of the month at 1.85 m occurred on 20th March at 8:48 am at Ballina while the peak at the logger was not recorded. The delay in tidal peak along North Creek is caused by restrictions in water entering North Creek due to width and depth, which also reduces the maximum tide height and range. The logger has not yet been surveyed in to the Australian Height Datum (AHD) so all heights are relative. Zero AHD approximates to mean sea level or a 0.925 m tide height and the readings have been adjusted to approximately AHD. Water height can be affected by river level, floods, tides, storm surge and rainfall and to a lesser extent temperature, wind and barometric pressure.
- **Rainfall** recorded during March at the Ballina Airport Automatic Weather Station (AWS) situated 1.8 km to the west of the North Creek logger was 139.2 mm falling over 18 days, which compares to the February rainfall of 70.2 mm over 18 days. The March average for Ballina Airport AWS is 200.4 mm therefore rainfall was below average. Peak March 24-hour rainfall of 37.6 mm was recorded between 9:00 am on 26th and 9:00 am on 27th. During March the Tuckean site 4 data logger located 19 km to the SW recorded 166.6 mm over 17 days, while the Rocky Mouth Creek data logger located 37 km to the south-west recorded 184.2 mm over 20 days.