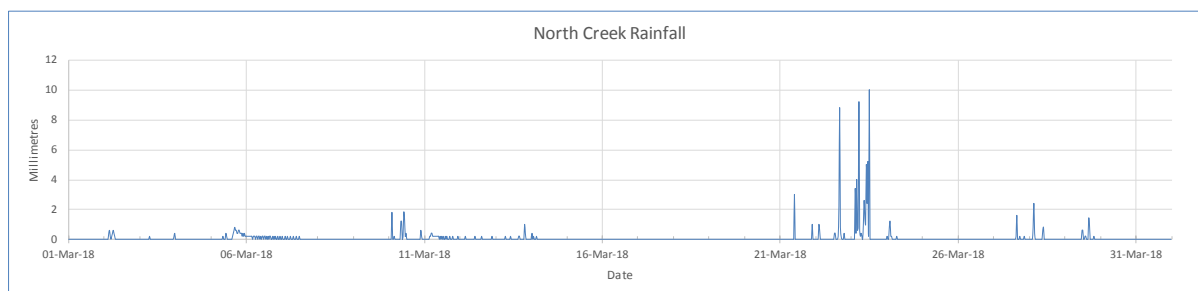


## North Creek water quality – March 2018

Data logger located in North Creek near airport.



### Interpretation

\*Note – Due to the availability of suitably experienced/approved contractors for maintenance/repair of equipment, the logger has been inactive since November 2017. As of 28 March 2018 the logger had been calibrated and is operational, however the modem required for reporting results is not operational and is currently being repaired. The North Creek logger and reporting of results will recommence in April.

- **Dissolved oxygen\* (DO)** was not recorded during March. 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 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** in 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. During March density was not recorded. Fresh water is normally close to 1.0, while sea water is slightly denser at 1.027g/cm<sup>3</sup>, which leads to the formation of salt wedges and acid water is even denser (Sulfuric acid SG = 1.94 g/cm<sup>3</sup>). 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 during March. The highest tides of the month at 1.79 m occurred on the 1<sup>st</sup> at 08:49 am and the 2<sup>nd</sup> at 9.35 am at the Ballina River entrance with a delay of approximately one hour at the logger. 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 by the Ballina Airport Automatic Weather Station (AWS) situated 1.8 km to the west of North Creek logger was 119.2 mm falling over 16 days, which compares to February rainfall of 222.8 mm over 23 days. Peak rainfall of 10.0 mm was recorded on the 23 March over 30 minutes between 11:30 am and 12:00 pm. During March the Tuckean site 4 data logger located 19 km to the SW failed to record, however a nearby station recorded 163.6 mm over 18 days, while the Rocky Mouth Creek data logger located 37 km to the south-west recorded 178.8 mm over 29 days.