

Te Mania at SH2

29 June 2018



Figure 1. Map showing the location of the site.

Table 1. Site metadata.

Aquarius ID:	BQ711622	Labstar ID:	513505 / BOP710022
LAWA ID:	EBOP-00026	REC Reach:	4000427
Easting:	1857111	Northing:	5836225
Longitude:	175.91110	Latitude:	-37.58476
Parent Catchment:	Tauranga Harbour	Biophysical Unit:	VA/Gentle
Elevation:	8m	Water Level:	Yes
Flow:	Yes	Automated:	Yes

Summary Statistics

Table 2. Summary statistics calculated from all available data.

Variable	n	Min	Max	Mean	Median	Perc_95 th	Perc_5t h	StDev	SE
Ammoniacal N (g/m ³)	239	0.000	0.245	0.024	0.019	0.043	0.008	0.023	0.002
Conductivity (mS/cm)	239	0.049	0.119	0.074	0.074	0.087	0.060	0.009	0.001
Dis Oxygen Sat (%)	80	85.400	122.000	95.600	95.400	104.000	88.300	5.600	0.626
DRP (g/m ³)	239	0.000	0.044	0.008	0.007	0.018	0.002	0.005	0.000
E coli (cfu/100ml)	226	1.000	25000.000	658.000	275.000	1900.000	61.000	1900.000	127.000
N (Tot) (g/m ³)	86	0.108	1.240	0.401	0.326	0.764	0.207	0.207	0.022
Nitrite Nitrate (as N) (g/m ³)	221	0.000	1.190	0.301	0.247	0.645	0.098	0.177	0.012
O2 (Dis) (g/m ³)	233	6.800	12.000	9.640	9.690	11.000	8.500	0.799	0.052
P (Tot) (g/m ³)	240	0.003	0.422	0.023	0.016	0.052	0.008	0.035	0.002
pH (pH Units)	235	5.960	7.800	6.880	6.900	7.330	6.360	0.320	0.021
Tot Susp Sed (g/m ³)	237	0.390	360.000	13.400	6.000	38.000	1.500	33.600	2.180
Turbidity (NTU)	225	0.900	160.000	7.270	4.800	17.800	2.100	12.800	0.854
Water Clarity (m)	146	0.096	5.620	1.730	1.520	3.520	0.460	1.040	0.086
Water Temp (°C)	439	-1.000	22.000	13.800	14.300	18.900	0.000	4.520	0.216

State of the Site

Comparison Plots

These figures show how the site compares to the distribution of data from other sites in the region. They are designed to provide quick, easy to understand information about comparative state. However, site assessment should not rely on this information alone.

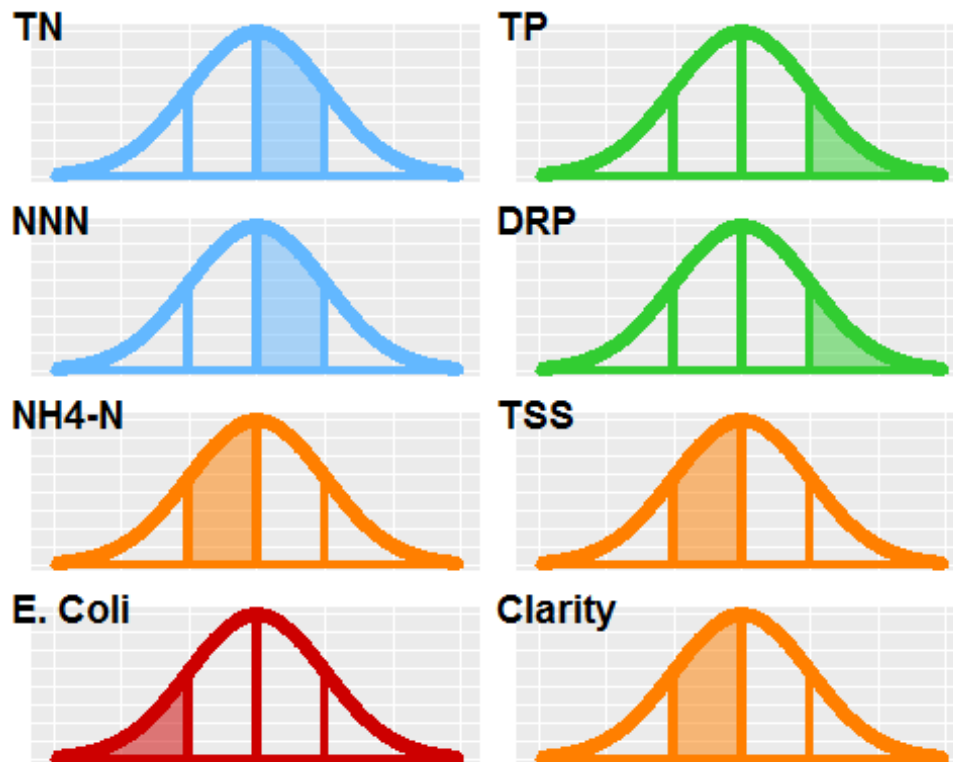


Figure 2. Comparison of the subject site against other monitoring sites in the Bay of Plenty.

NOF Assessment

Tables 3, 4, and 5 contain information about how the site compared to the National Objectives Framework, part of the National Policy Statement for Freshwater Management (2014). Please refer to this document for more information about these attributes.

Table 3. Assessment against the Ammonia (Toxicity) attribute.

Timeframe	Start	End	n	Median	Maximum	Band
1 Year	2016-04-06	2017-04-06	12	0.008	0.011	A
5 Years	2012-04-07	2017-04-06	58	0.006	0.041	A
10 Years	2007-04-09	2017-04-06	111	0.006	0.060	B
All	1990-11-02	2017-04-06	233	0.008	0.091	B

Table 4. Assessment against the Nitrate (Toxicity) attribute.

Timeframe	Start	End	n	Median	Perc_95th	Band
1 Year	2016-04-06	2017-04-06	12	0.280	0.610	A
5 Years	2012-04-07	2017-04-06	59	0.220	0.580	A
10 Years	2007-04-09	2017-04-06	113	0.240	0.620	A
All	1993-12-13	2017-04-06	221	0.250	0.640	A

Table 5. Assessment against the Escherichia coli (human health for recreation) attribute.

Timeframe	Start	End	n	Exc_540	Exc_260	Median	Perc_95th	Band	Swimmable
5 Years	2012-04-07	2017-04-06	59	NA	NA	NA	NA	NA	NA

Surveillance, alert, and action levels for freshwater.

Table 6 contains information about how the site ranks against the ‘Surveillance, alert, and action level’ framework for freshwater, part of the Microbiological Guidelines for Freshwaters (2003). This framework is designed to inform the public of the bathing risk at a particular site, based on the results of a single water quality sample. Although many of BoPRC’s water quality monitoring sites are not specifically valued for swimming purposes, this framework can provide a useful indicator of the extent and frequency of faecal contamination that may pose a risk to human health.

The three tier system used in this framework is as follows:

- **Surveillance (Green):** Under the surveillance condition, beaches graded Good, Fair or Poor have the potential to be affected by faecal contamination events, and routine monitoring must continue
- **Alert (Amber):** The alert mode is triggered when a single bacteriological sample exceeds a predetermined value. Under alert mode, sampling frequency should be increased to daily (for bathing sites), and catchment assessment data referred to for potential faecal sources.
- **Action (Red):** The action mode is triggered when a single sample exceeds a pre-determined value. Under the action mode, the local authority and health authorities warn the public, using appropriate methods, that the beach is unsuitable for recreation and arrange for the local authority to erect signs at the beach warning the public of a health danger.

Data is summarised into three periods: 5 years, 10 years, and all available data. The overall percentage of samples that fit into each category, for each period, are calculated on the right of the table. You can gain an understanding of the prevalence of faecal contamination by comparing the percentage of samples that fall into each category, across time periods.

Table 6. Surveillance, alert, and action levels for freshwater

Timeframe	Start	End	n	Median	Perc_95th	Perc_Green	Perc_Amber	Perc_Red
5 Years	2012-04-07	2017-04-06	59	320	3860	44.1	30.5	25.4
10 Years	2007-04-09	2017-04-06	113	290	2910	46.9	26.5	26.5
All	1993-09-16	2017-04-06	226	275	2080	49.1	25.2	25.7

Trend Analysis

Table 7 presents trend analysis data for each parameter presented in Figure 3. Significant trends are those where the $P < 0.05$ and the 95% confidence interval of the sen slope does not include zero. Significant trends have been split into four categories depending on the percent annual change (PAC) value. Trends with a PAC greater than 1% per annum have been classed as either 'Improving 2' or 'Degrading 2'. Trends that have a PAC between 0% and 1% have been classed as 'Improving 1' or 'Degrading 1'. The 1% threshold is arbitrary, but implies that significant trends with greater PAC values are more important than those less than 1%.

Table 7. Trend statistics for the subject site.

Parameter	Timeframe	Start	End	Sen_Slope	PAC	P_Value	Trend
TN	All	2009-11-17	2017-04-06	-0.0050	-1.53	0.36	No Trend
NNN	10 Years	2007-04-09	2017-04-06	-0.0024	-1.01	0.21	No Trend
NH4N	10 Years	2007-04-09	2017-04-06	-0.0008	-5.16	<0.05	Improving 2
TP	10 Years	2007-04-09	2017-04-06	0.0005	2.94	0.06	No Trend
DRP	10 Years	1912-05-02	2017-04-06	0.0001	2.86	0.13	No Trend
ECOLI	10 Years	2007-04-09	2017-04-06	10.0000	3.45	0.31	No Trend
TSS	10 Years	2007-04-09	2017-04-06	-0.3633	-7.99	<0.001	Improving 2
CLARITY	10 Years	2012-04-07	2017-04-06	0.0421	6.14	0.22	No Trend

Time Series Plots

The Figure 3 shows timeseries plots for eight different parameters, pertaining to ecological and human health values. Data are presented on a time-scale according to the longest data record, and N and P species are on the same y axis scale.

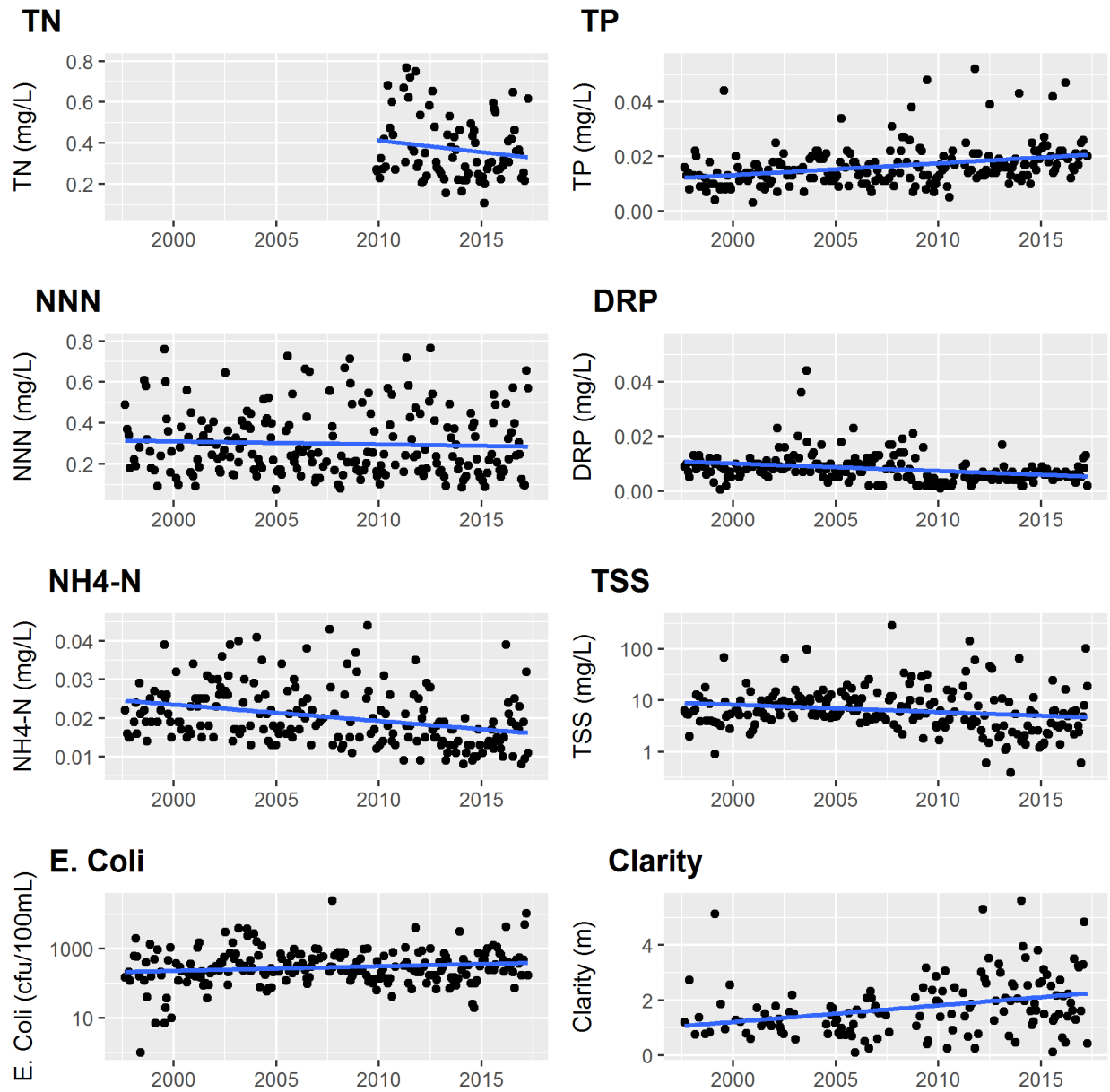


Figure 3. Time series of data for eight different parameters. The blue line represents a linear regression model.