

2016.09.23

1. Bathymetry

The shape file was obtained from Bay of Plenty Regional Council (Irwin, J. 1970). The outline from this file was modified to contain the rushes area using Land Information New Zealand (LINZ) data.

2. Meteorology

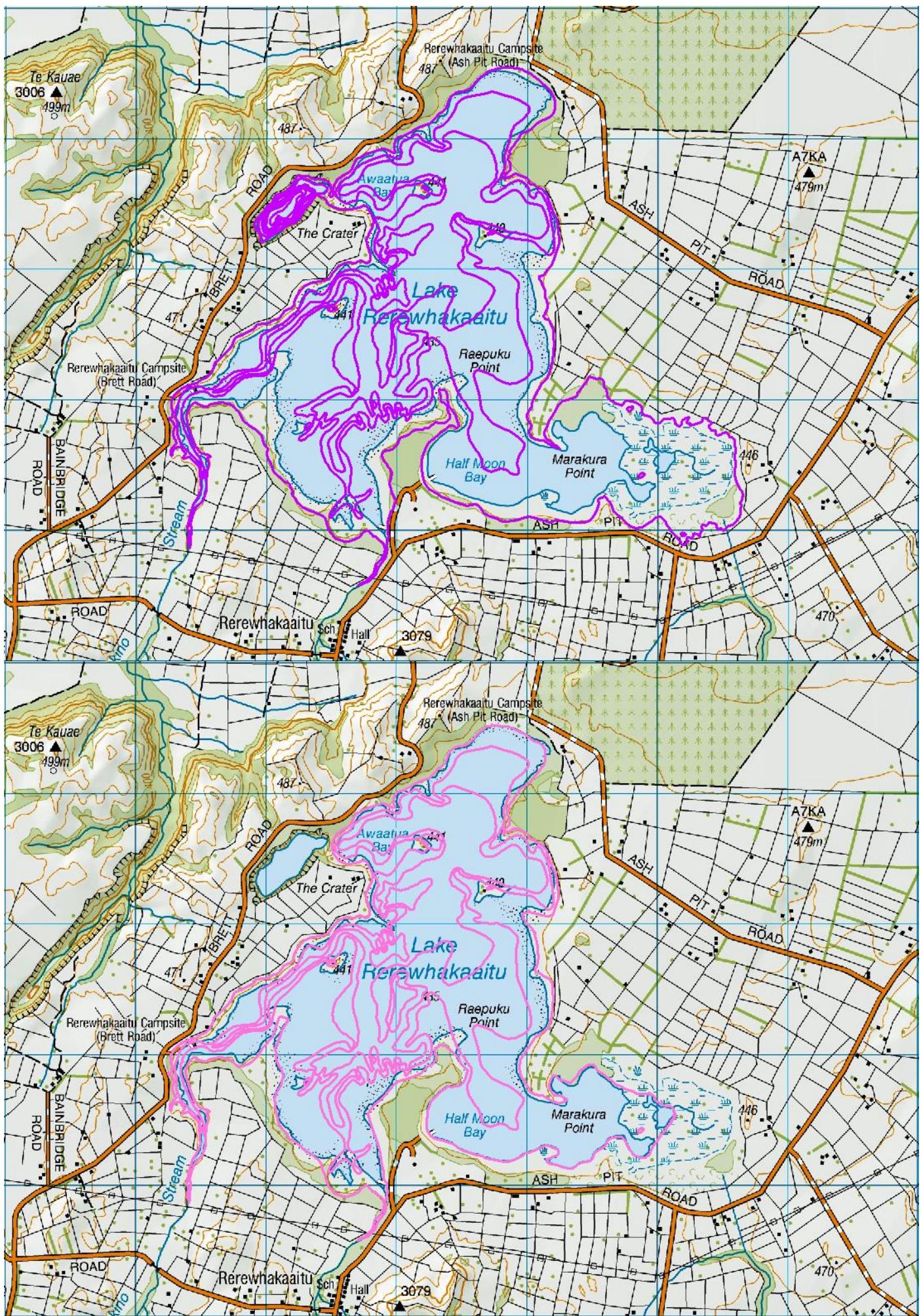
Data taken from Rotorua airport.

3. Inflow

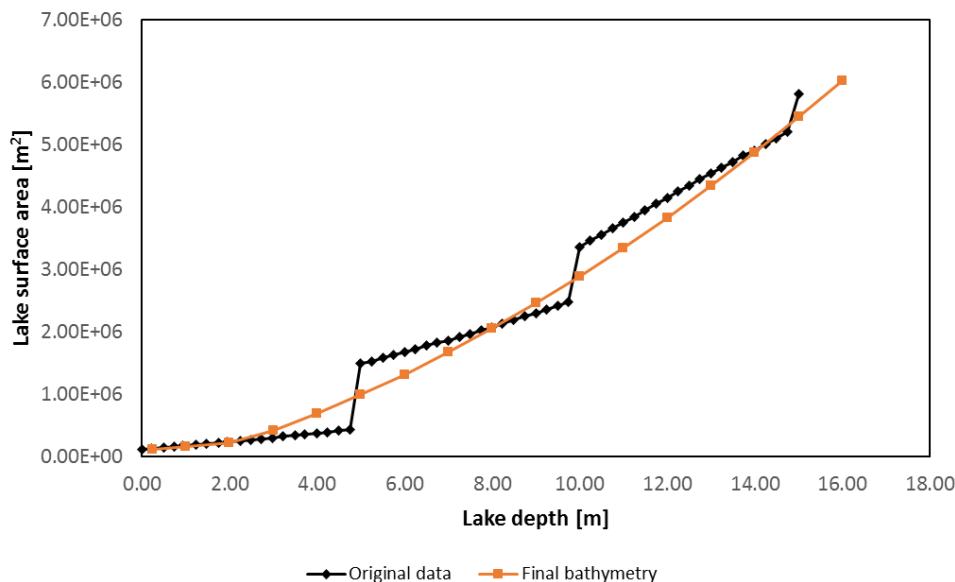
Inflows include Mangakino stream, Awaroa stream, precipitation and surface runoff from the catchment. Outflows are groundwater and evaporation from the surface of lake. Flows for Mangakino and Awaroa streams were estimated using Ngongotaha stream. The daily average flow for the Mangakino Stream has been synthesised by comparison with the Ngongotaha Stream (McIntosh, J. 2012 Appendix1) and a good match was found.

Reference

Irwin, J. 1970 : Lake Rerewhakaaitu, Provisional Bathymetry, 1:7,920. N.Z. Oceangr. Inst. Chart, Lake Series.

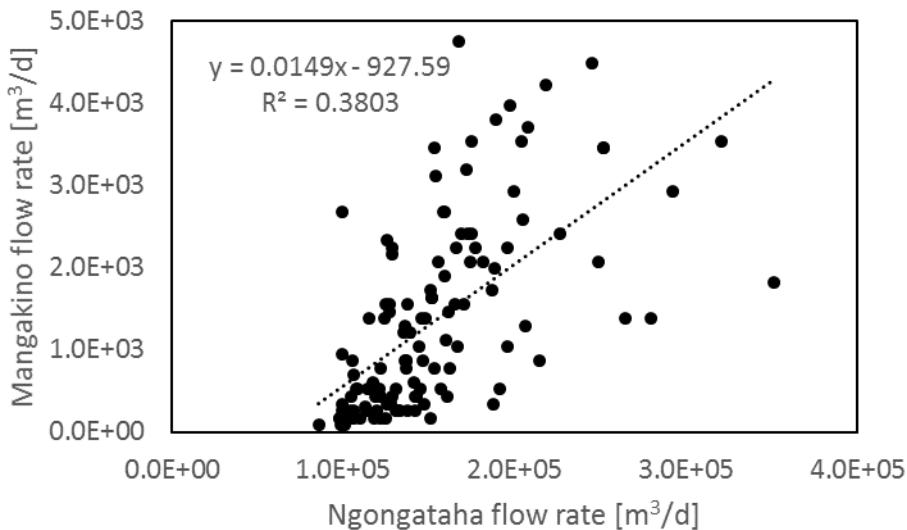


- Bathymetry of the lake

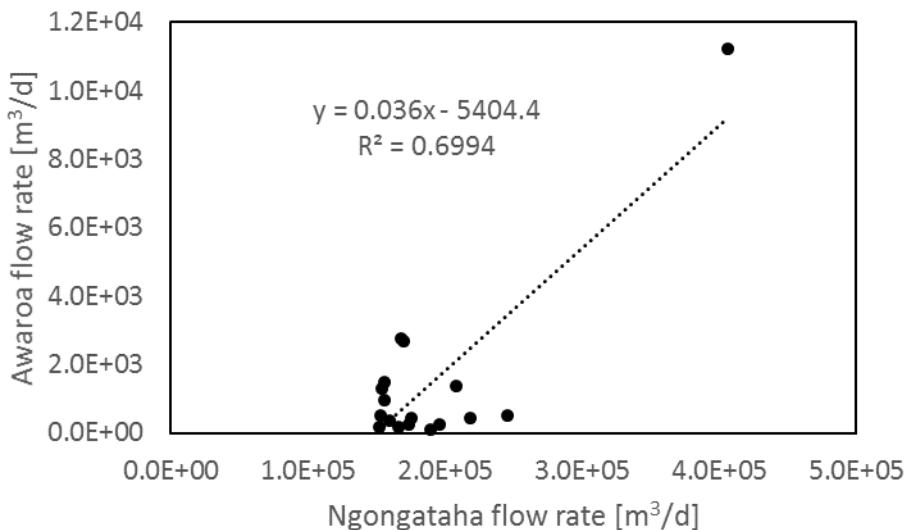


- Inflow assumptions

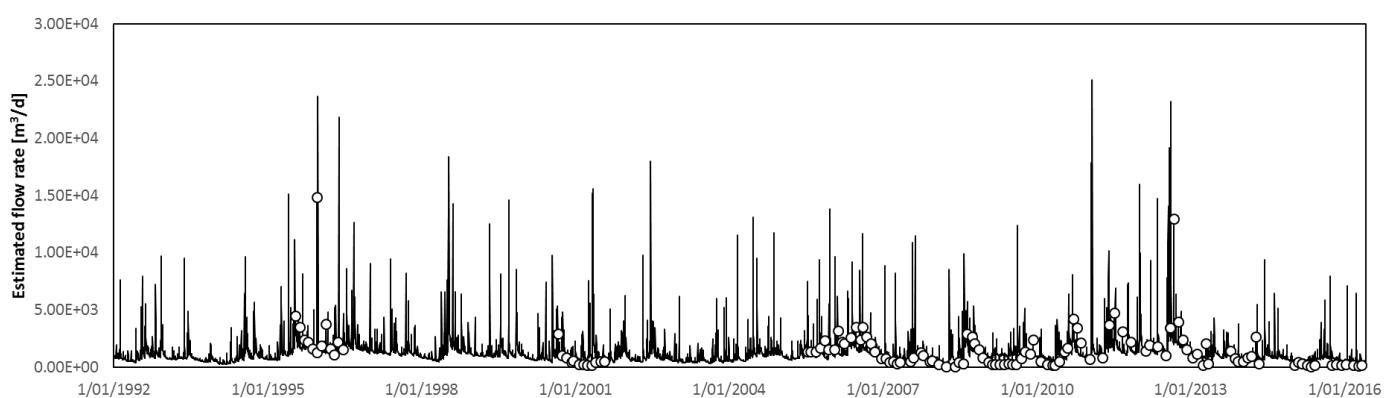
Ngongotaha – Mangakino comparison



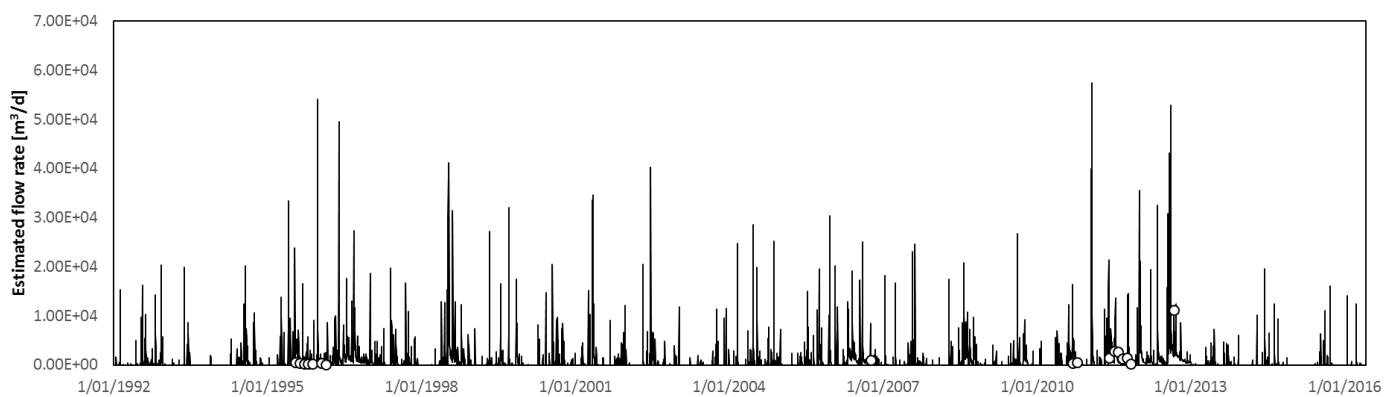
Ngongotaha – Awaroa comparison



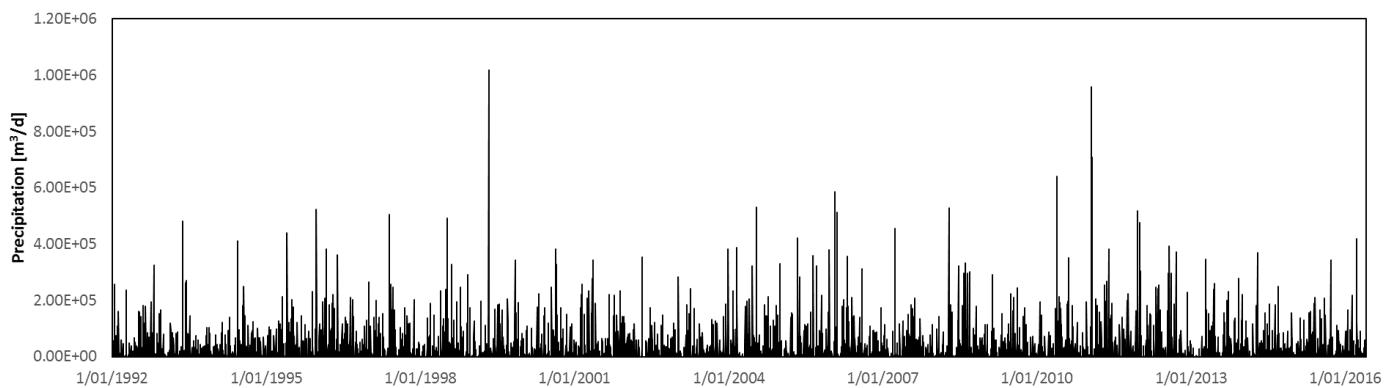
- Inflow



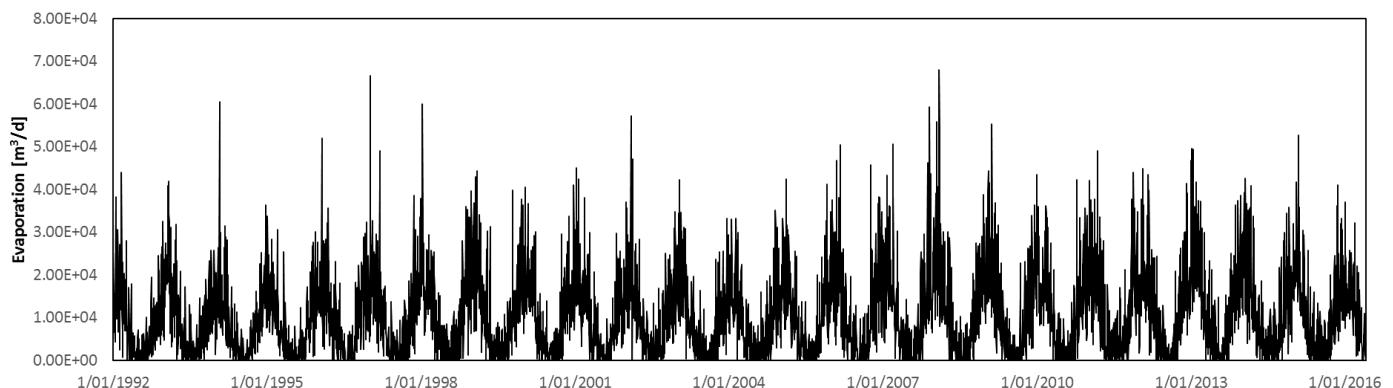
Mangakino stream



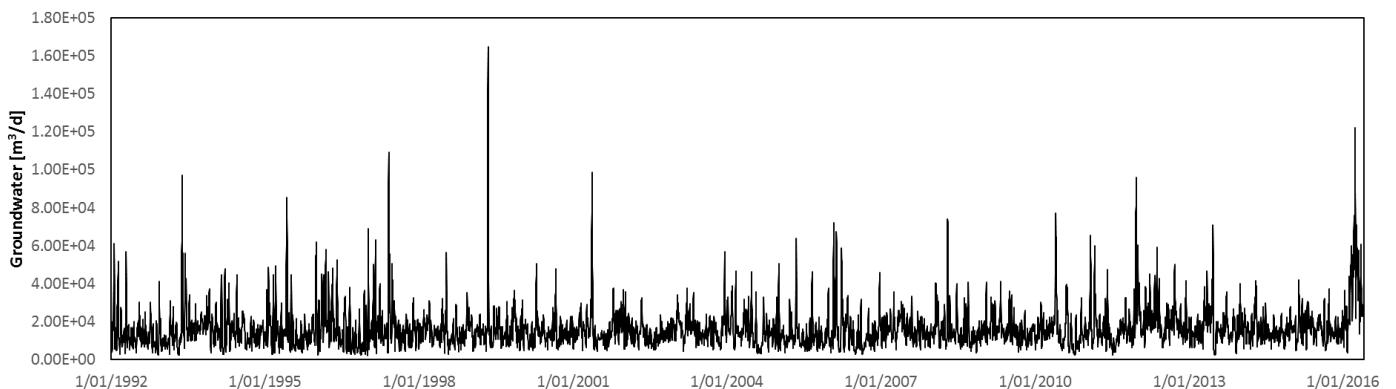
Awaroa stream



Precipitation



Evaporation



Groundwater

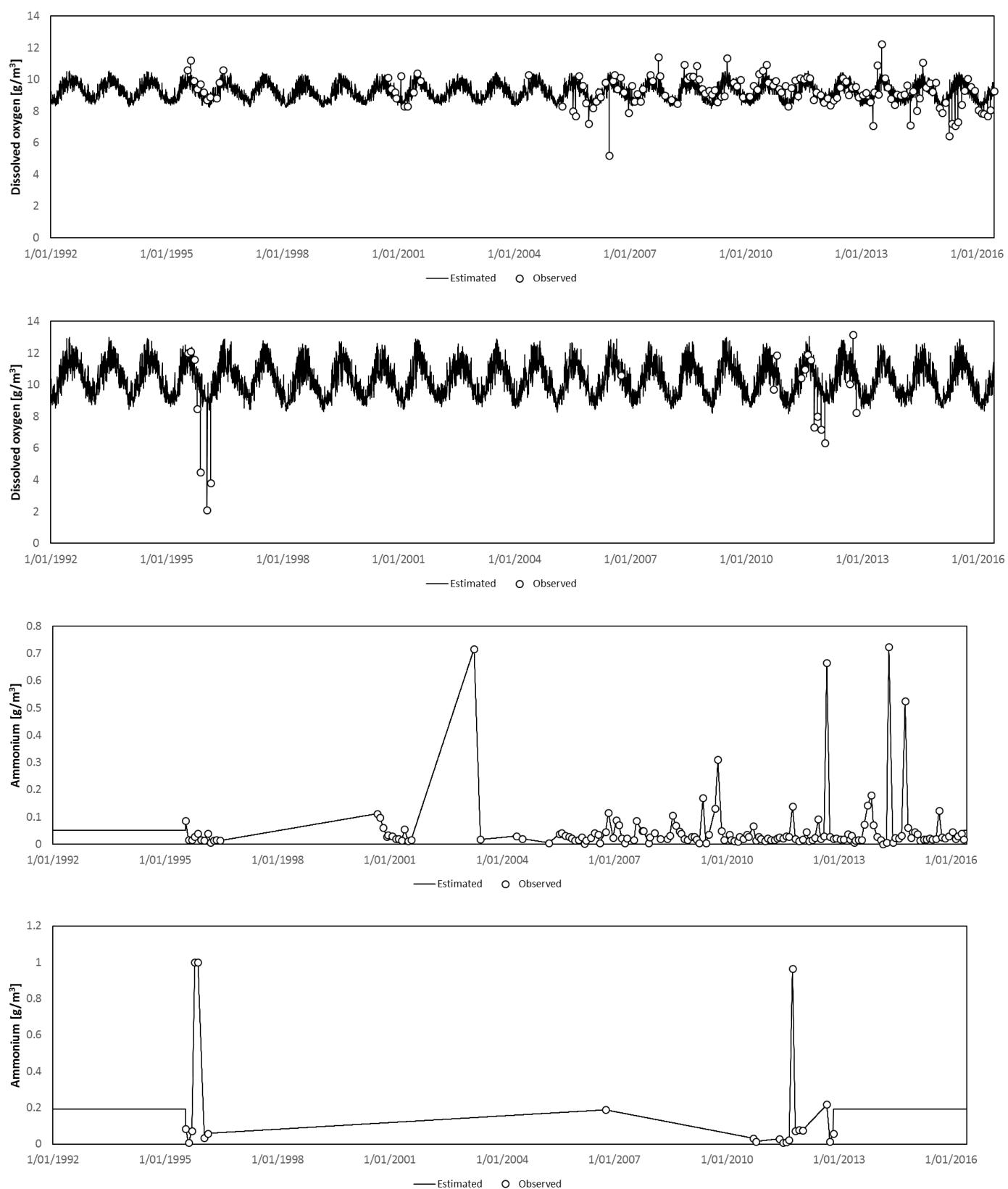
- Summary of flow

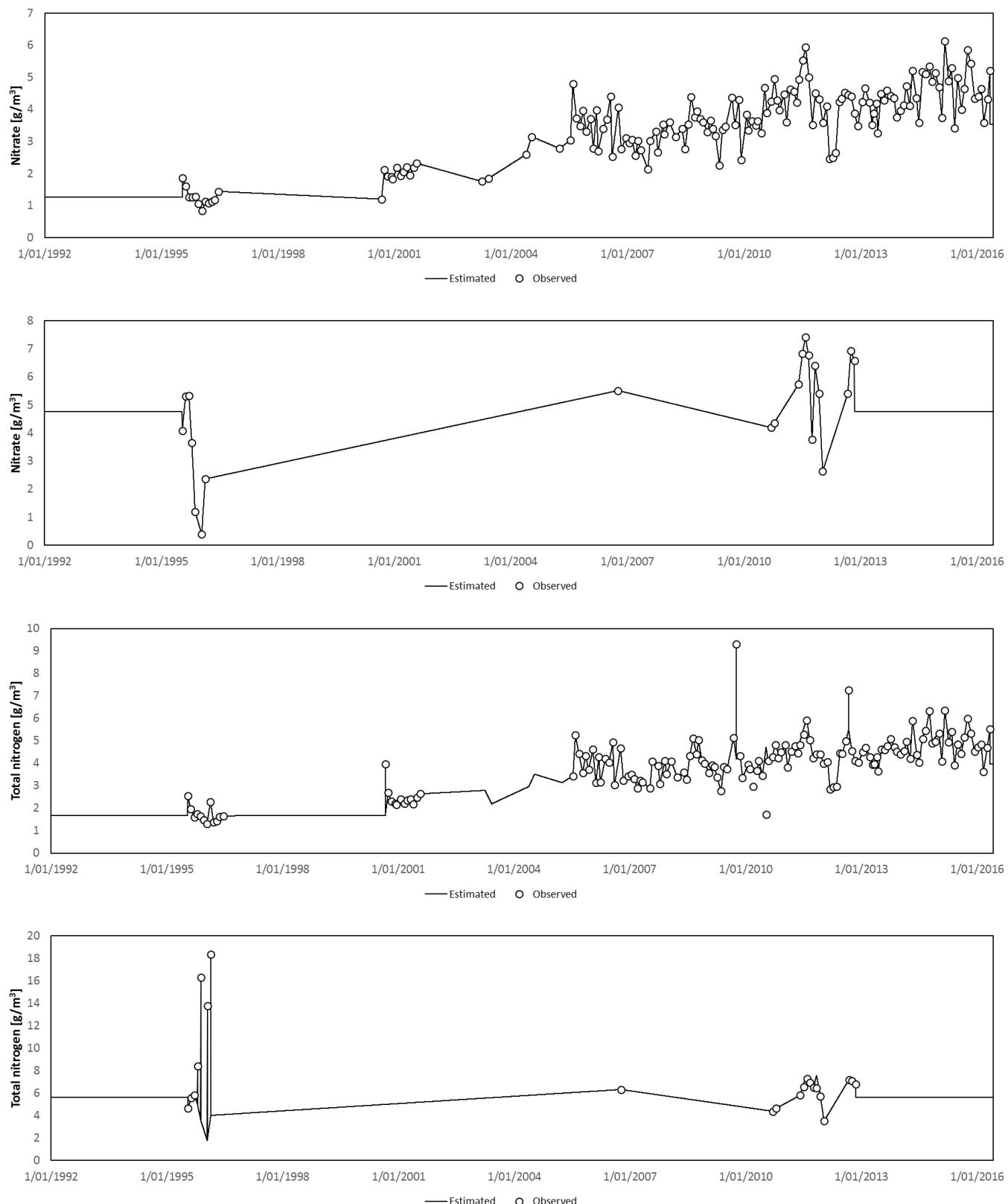
Lake	Lake area (km ²)	Inflow (L/s)			Outflow (L/s)				
		P	Q ^{SW} _{IN}	Sum	ET	Q ^{SW} _{OUT}	Q ^{GW LNET} _{OUT}	Sum	
Lake Rerewhakaaitu	5.1	232	55	287	-95	0	-192	-287	
Echo	4.9	202	108.4	310.6	-118.72	0	-191.98	-310.69	

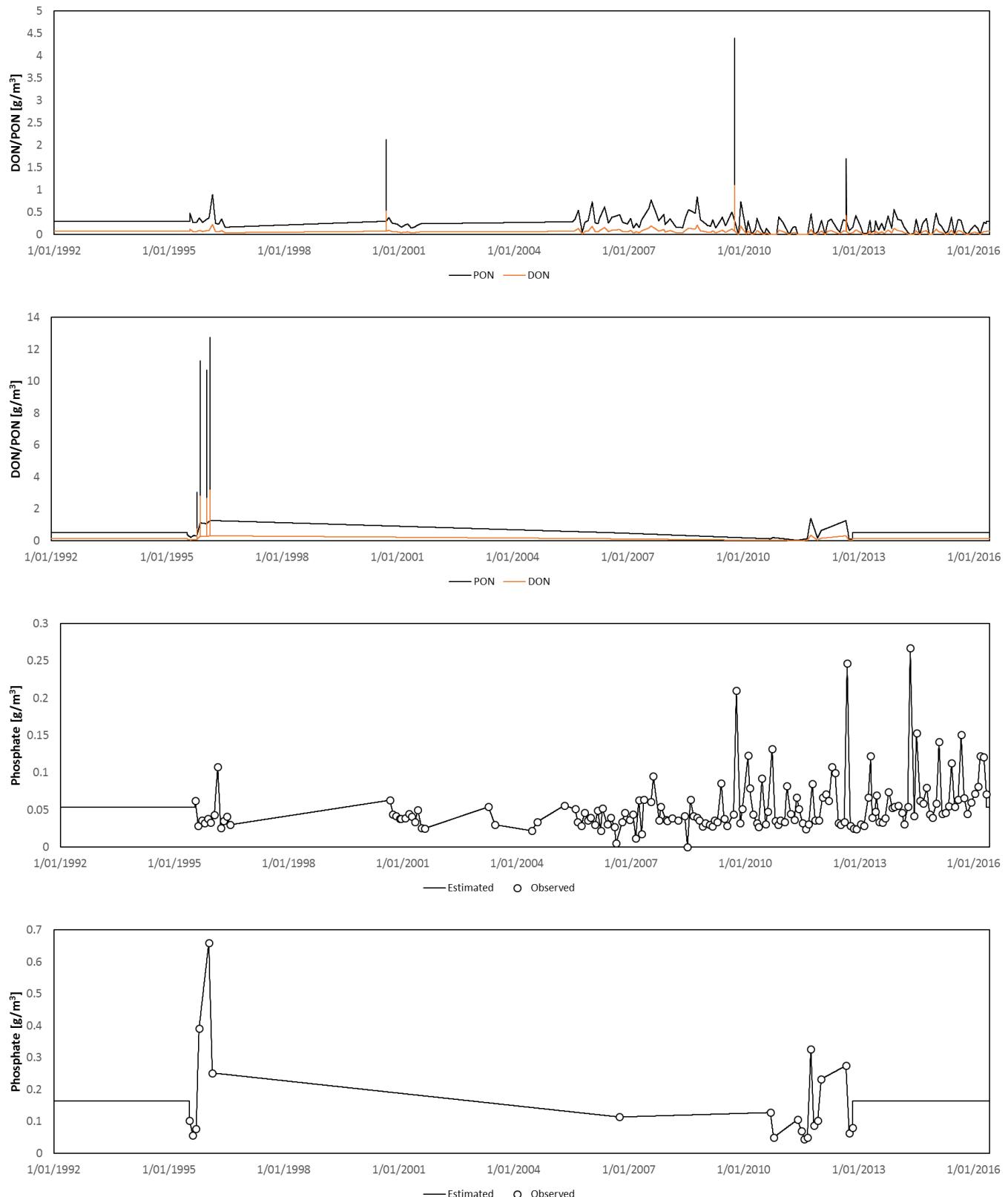
Lake	Surface inflow to lake (L/s)	Location x (NZMG)	Location y (NZMG)	Site	BOPRC site	Reference
Lake Rerewhakaaitu	15.7	2814600	6315600	Mangakino Stream base flow		McIntosh (2012)
Echo	15.46			Mangakino Stream base flow		
Lake Rerewhakaaitu	12.1	2814600	6315600	Mangakino Stream quick flow		McIntosh (2012)
Lake Rerewhakaaitu	9.8	2816000	6315500	Awaroa Stream quick flow		McIntosh (2012)
Echo	9.15			Awaroa Stream quick flow		
Lake Rerewhakaaitu	7.3	2815750	6318400	Brett Rd quick flow		McIntosh (2012)
Lake Rerewhakaaitu	6.1	unknown	unknown	Ash Pit Rd 1 quick flow		McIntosh (2012)
Lake Rerewhakaaitu	3.7	unknown	unknown	Ash Pit Rd 2 quick flow		McIntosh (2012)

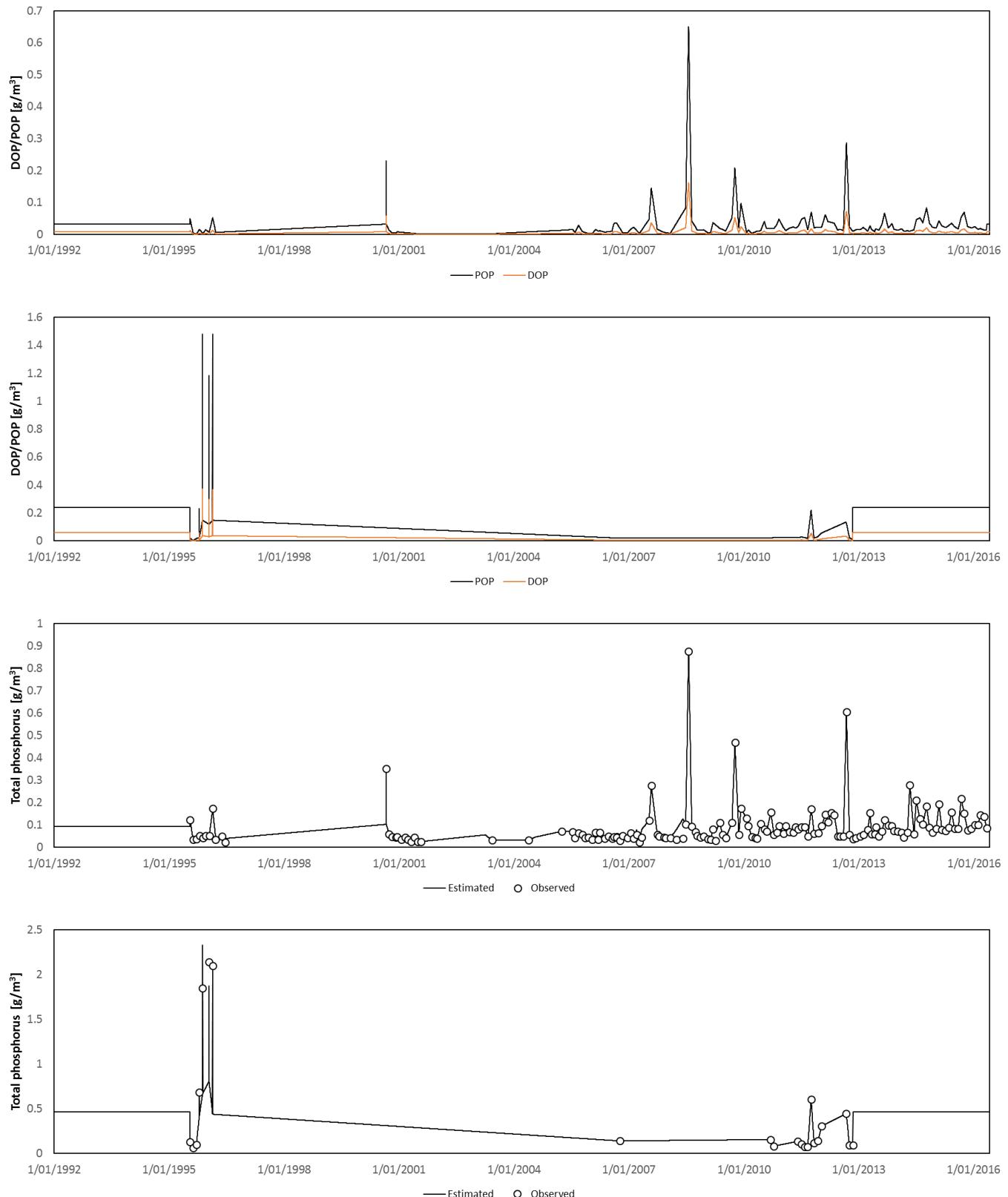
Inflow [L/s]	Mangakino Stream base flow	15.46
310.65	Awaroa Stream quick flow	9.15
	Precipitation	202.29
	Residual flow	83.74
Outflow [L/s]	Evaporation	-118.72
-310.69	Groundwater	-191.98
In - out		-0.05
	WL Difference (13.445 - 13.461 m)	0.10

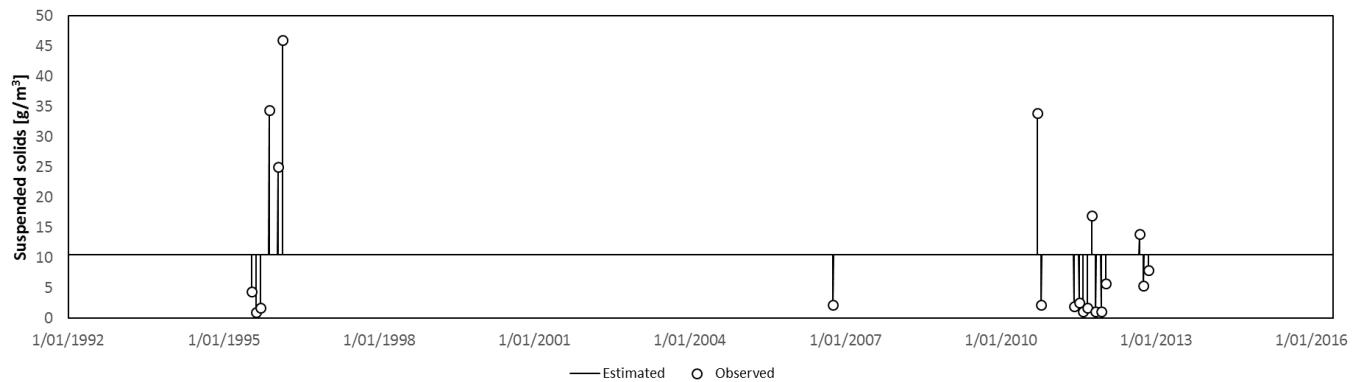
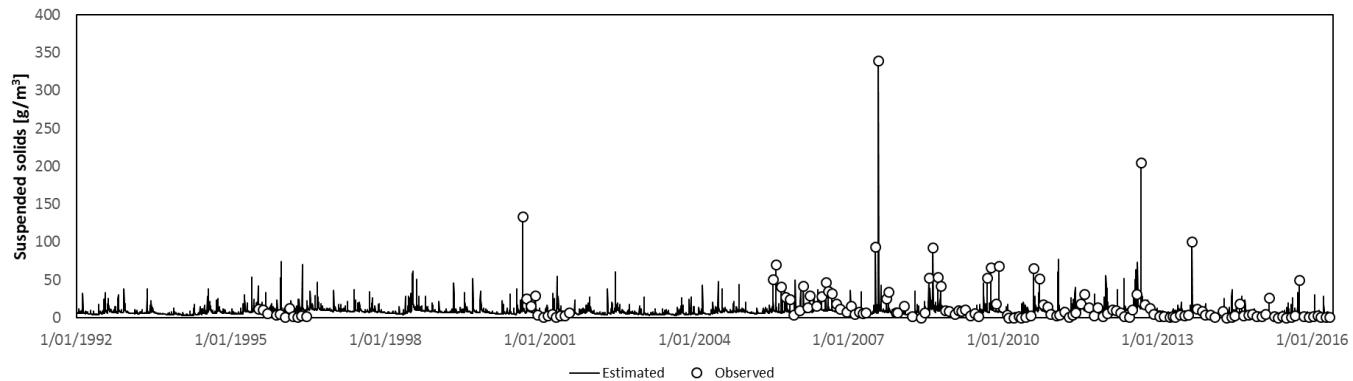
- Boundary conditions











- Summary of nutrient loading and concentrations

	g/d	Mang	Awa	Rain	Resi	kg/y	Mang	Awa	Rain	Resi	g/m³	Mang	Awa	Rain	Resi
NH4		90.15	109.44	0.00	446.95		32.91	39.95	0.00	163.14		0.073	0.146	0.000	0.073
NO3		3563.95	3394.20	1958.37	19731.89		1300.84	1238.88	714.81	7202.14		2.653	4.395	0.112	2.653
DON/PON		440.62	695.76	0.00	2389.17		160.83	253.95	0.00	872.05		0.321	0.816	0.000	0.321
TN		4094.72	4199.41	1958.37	22568.01		1494.57	1532.78	714.81	8237.32		3.048	5.357	0.112	3.048
PO4		67.42	142.72	261.12	392.96		24.61	52.09	95.31	143.43		0.050	0.168	0.015	0.050
DOP/POP		46.57	96.93	0.00	219.84		17.00	35.38	0.00	80.24		0.031	0.146	0.000	0.031
TP		113.98	239.64	261.12	612.79		41.60	87.47	95.31	223.67		0.081	0.314	0.015	0.081
SS		18147.33	8341.34	0.00	74739.20		6623.78	3044.59	0.00	27279.81		8.559	10.555	0.000	8.559

- Simulation results (work in progress)

