



Modelling the restoration of Lake Okaro

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Te Pūtahi Rangahau Taiao

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Te Whare Wānanga o Waikato

LERNZ

TEBKS

Lake Ecosystem Restoration
New Zealand

Lake Okaro
(degraded lake)



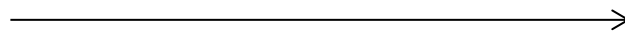
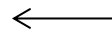
Photos provided by Dylan Clarke, LERNZ website, and David Hamilton

Feed results into a previously calibrated lake model (DYRESM-CAEDYM) to assess changes in water quality

Assess nutrients in the catchment (INCA N & P)

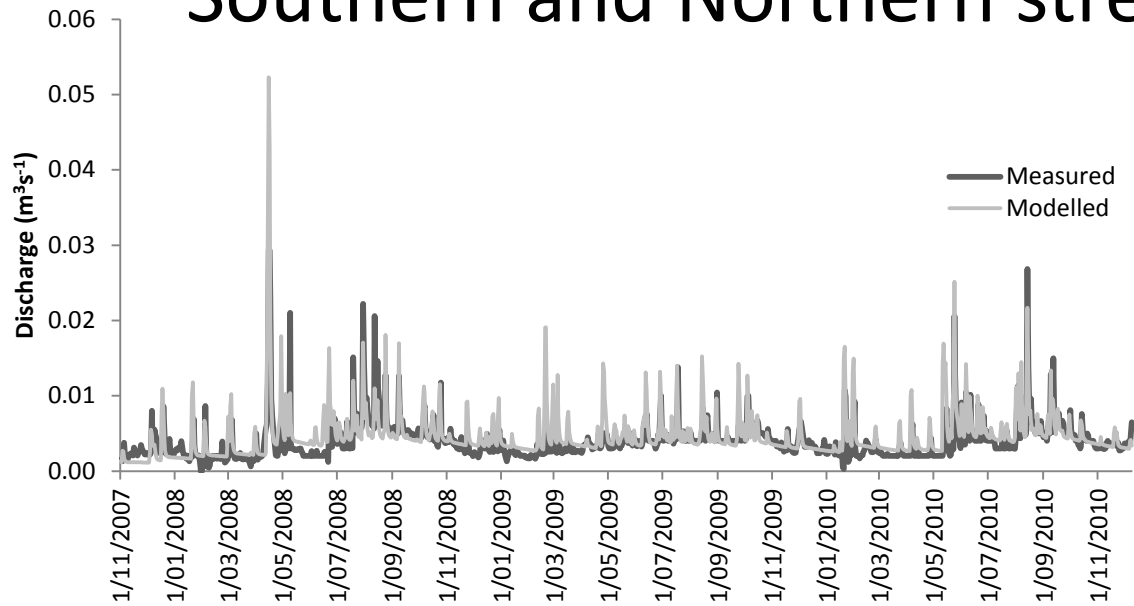
Estimation of current catchment loads (baseline)

Test scenarios (no wetland/riparian margins, total dairy, total native forest)

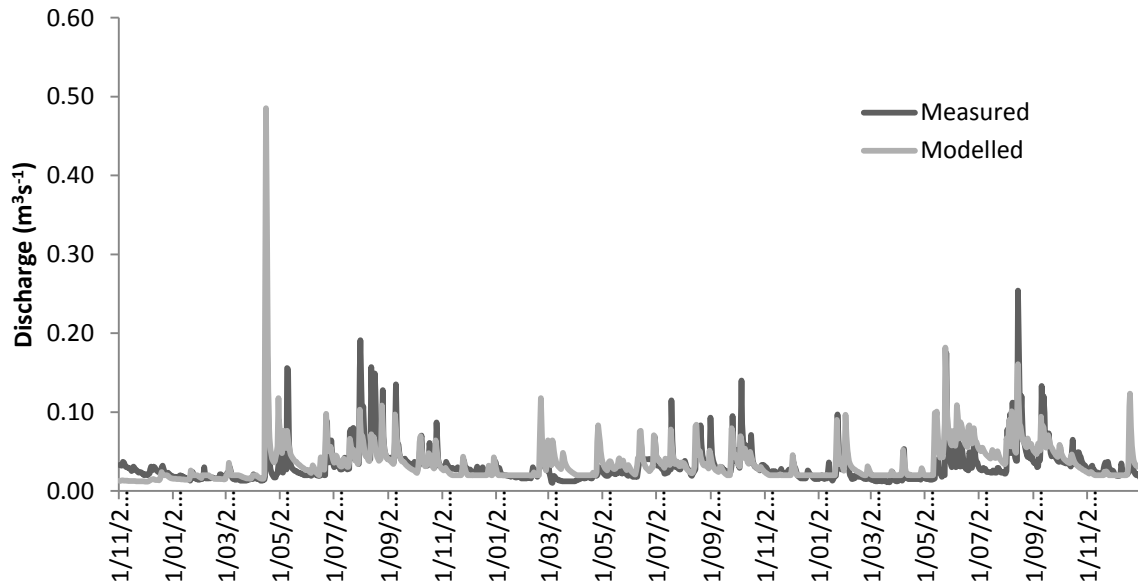


Catchment model current results

Southern and Northern stream discharge

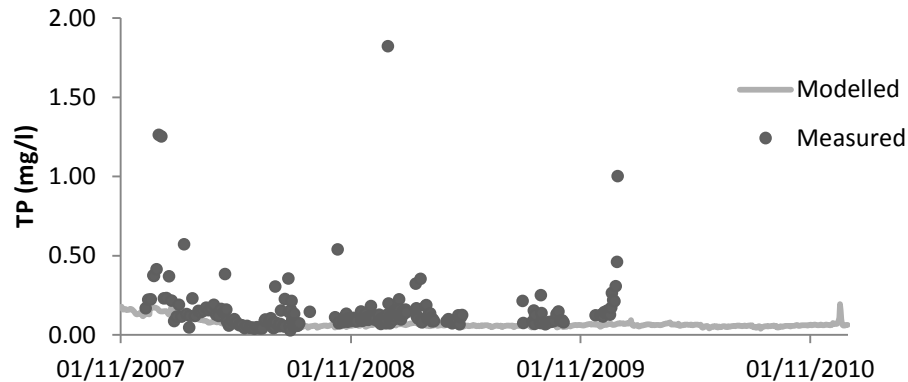
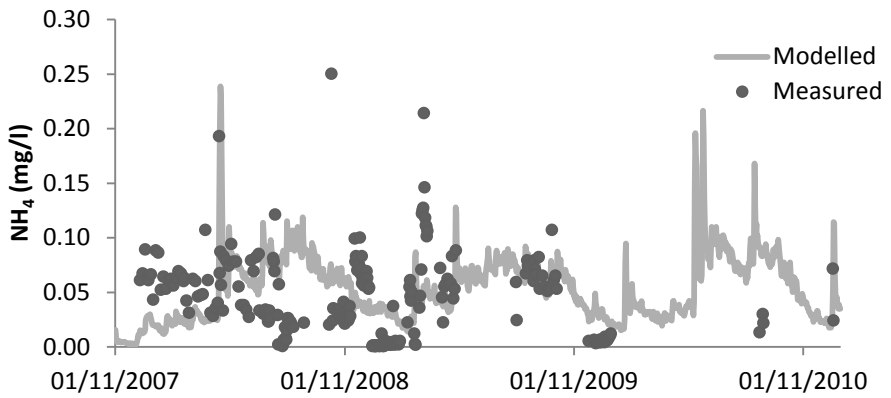
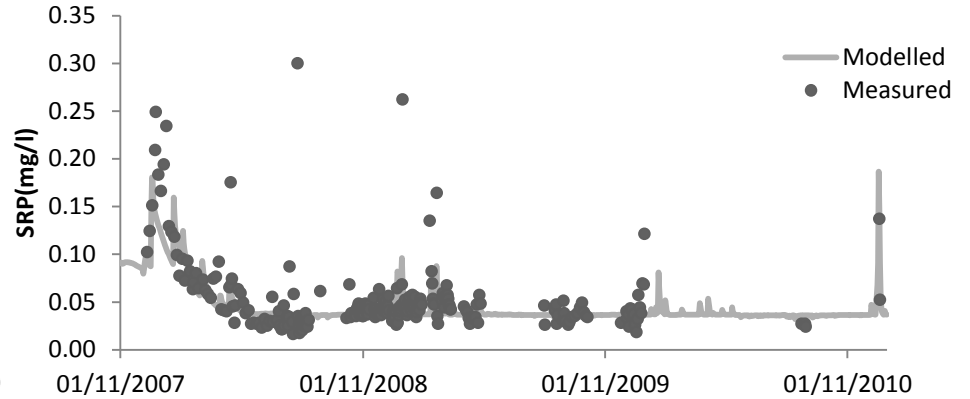
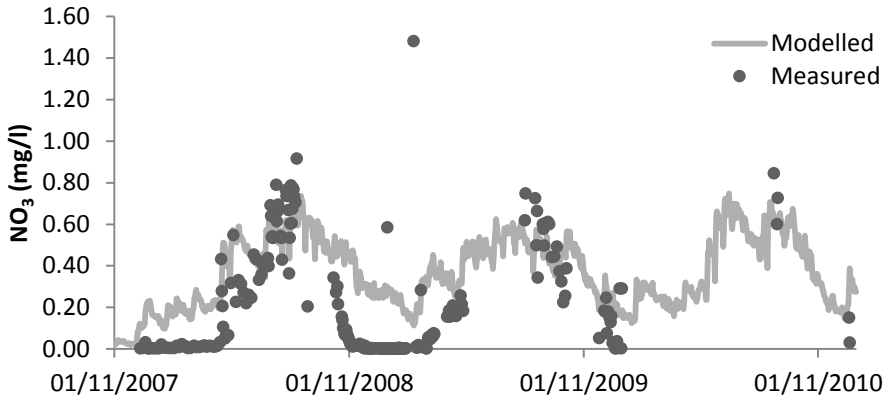


Mean absolute error (m3 s-1)	0.001
RMSE (m3 s-1)	0.038
Pearson R	0.719
R2	0.517
Mean Obs	0.004
Normalised mean abs error	0.356
Nash Sutcliffe efficiency	0.102



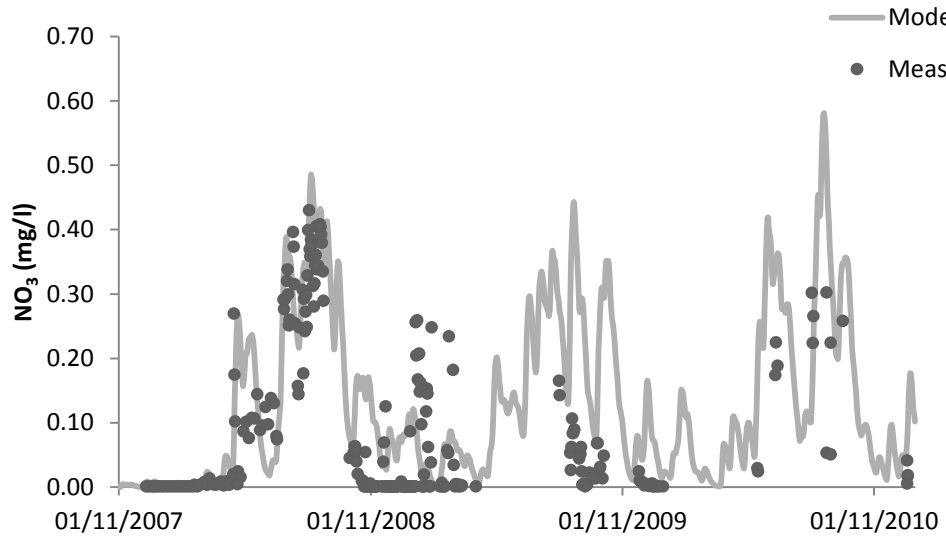
Mean absolute error (m3 s-1)	0.011
RMSE (m3 s-1)	0.106
Pearson R	0.598
R2	0.358
Mean Obs	0.032
Normalised mean abs error	0.362
Nash Sutcliffe efficiency	0.000

Southern stream nutrients

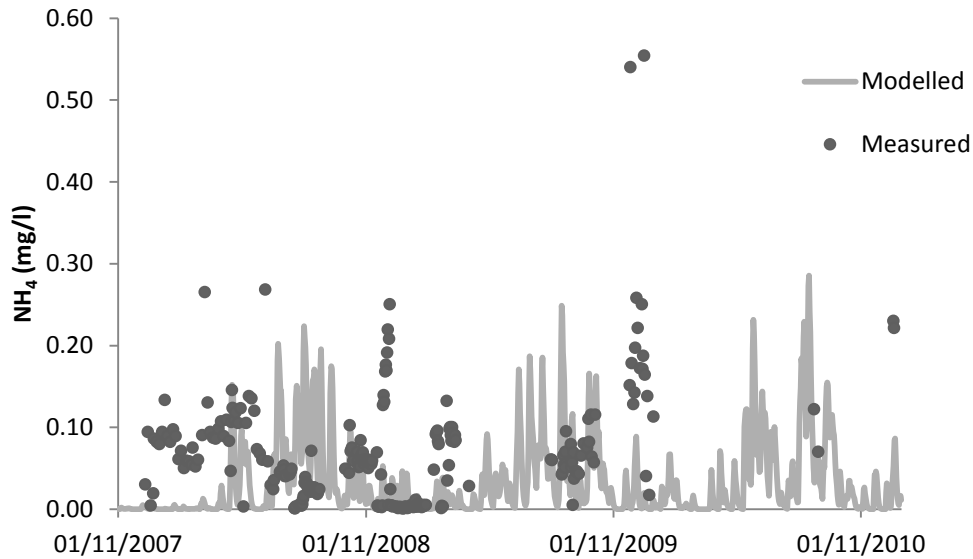


South stream nutrients	R	MAE	NMAE	RMSE	NRMSE
Nitrate (NO₃)	0.513	0.186	1.003	0.218	2.525
Ammonium (NH₄)	0.179	0.037	0.859	0.052	1.199
Total phosphorus (TP)	0.358	0.077	0.541	0.182	1.276
Soluble reactive phosphorus (SRP)	0.640	0.015	0.281	0.030	0.000

Northern stream nutrients



North stream nutrients	R	MAE	NMAE	RMSE	NRMSE
Nitrate (NO₃)	0.717	0.088	1.011	0.117	1.346
Ammonium (NH₄)	0.100	0.065	0.997	0.094	1.452
Total phosphorus (TP)	N/A	N/A	N/A	N/A	N/A
Soluble reactive phosphorus (SRP)	N/A	N/A	N/A	N/A	N/A



Acknowledgements

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LERNZ LERNZ - Lake Ecosystem Restoration New Zealand, the University of Waikato

Great news! Most of the Rotorua lakes in the programme are at, or close to, their water quality target

Click the BoPRC link for more information

Water quality results: www.boprc.govt.nz/14062.aspx

