Ohau Diversion Wall - Reconsenting

Background and feedback session

Rotorua Te Arawa Lakes Programme in Association with:

- Bay of Plenty Regional Council
- Beca Ltd
- University of Waikato
- Wildlands

ROTORUA TE ARAWA LAKES PROGRAMME

BAY OF PLENTY REGIONAL COUNCIL TOI MOANA

THE UNIVERSITY OF WAIKATO Te Whare Wānanga o Waikato

Wildlands www.wildlands.co.nz

Beca

Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Lakes Trust.

Working as one to protect our lakes with funding assistance from the Ministry for the Environment.

#love our lakes

rotorualakes.co.nz

Background

- Ohau channel diversion structure constructed in 2007
- Granted a 12-year consent – expires October 2017
- On behalf of the Bay of Plenty Regional Council Beca, in collaboration with Wildlands and University of Waikato, preparing consent applications for wall structure
- Consents will be for ongoing water diversion and any corrosion protection works.
- Longer term desirable
- Feedback currently being sought

Core Team

Andy Bruere
Rotorua Lake Operations Manager

Keith Frentz
Lead Consultation

Cushla Loomb
Project Manager & Lead Planner

Andy Woolhouse
Councils Project Manager

Willie Shaw
Avifauna and habitats specialist

Genevieve Doube
Planner

Brendan Hicks
Fisheries Specialist

David Hamilton
Water Quality Specialist

Moritz Lehmann
Water Quality Specialist

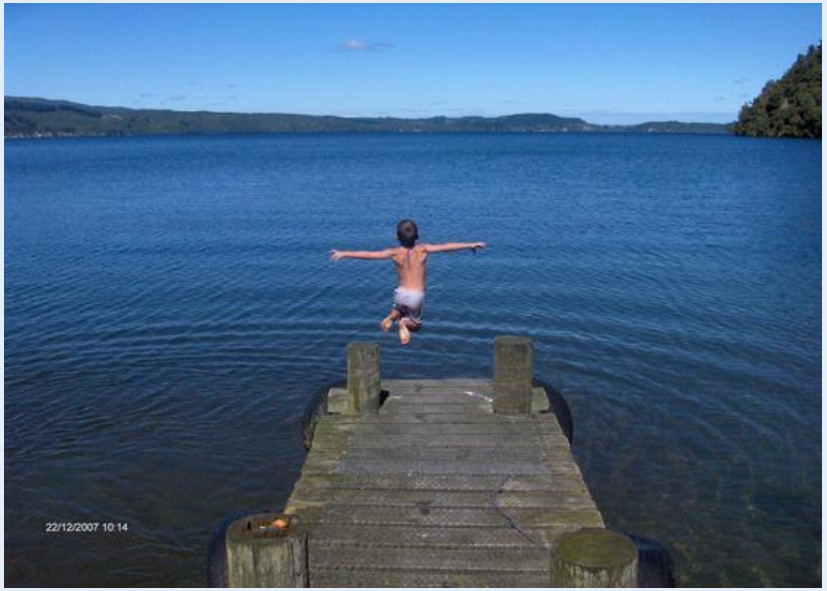
ROTORUA TE ARAWA LAKES PROGRAMME

Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Lakes Trust.
Working as one to protect our lakes with funding assistance from the Ministry for the Environment.

#love our lakes
rotorualakes.co.nz

Long-term sustainable aim

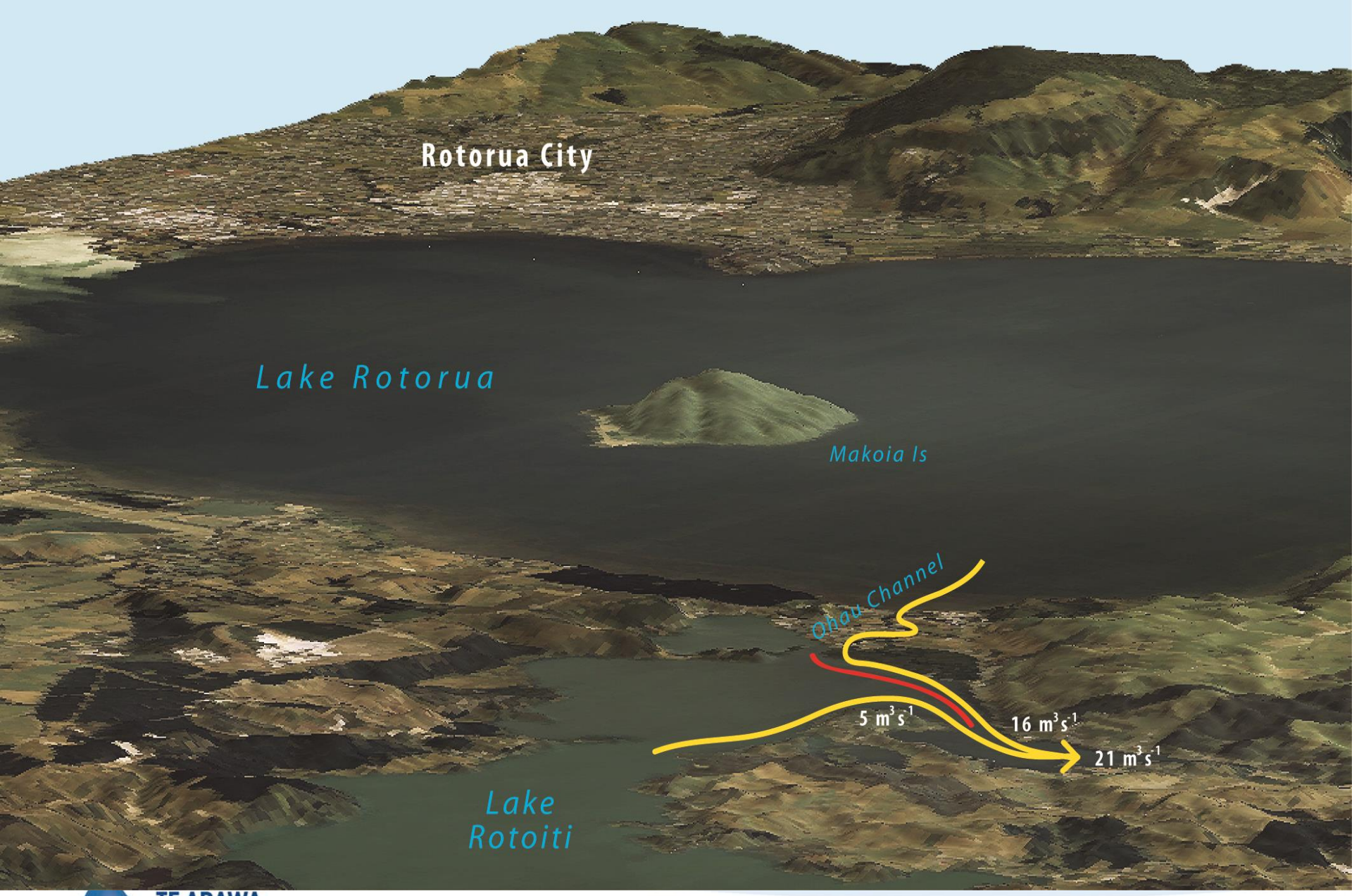
From this to this

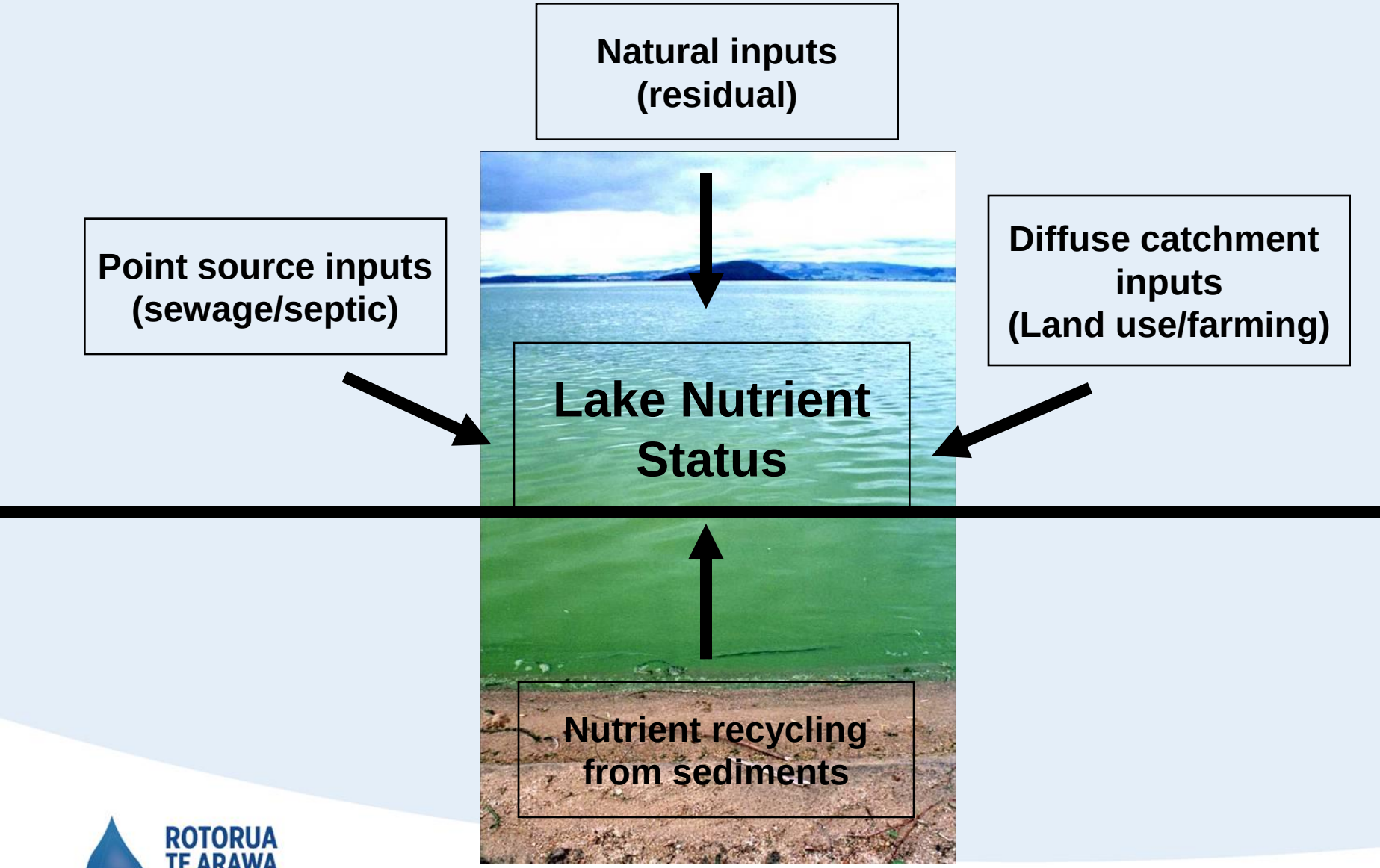


ROTORUA TE ARAWA LAKES PROGRAMME

Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Lakes Trust.
Working as one to protect our lakes with funding assistance from the Ministry for the Environment.

#love our lakes
rotorualakes.co.nz


Rotorua City
Lake Rotorua
Makoia Is
Ohau Channel
5 m³s⁻¹
16 m³s⁻¹
21 m³s⁻¹
Lake Rotoiti

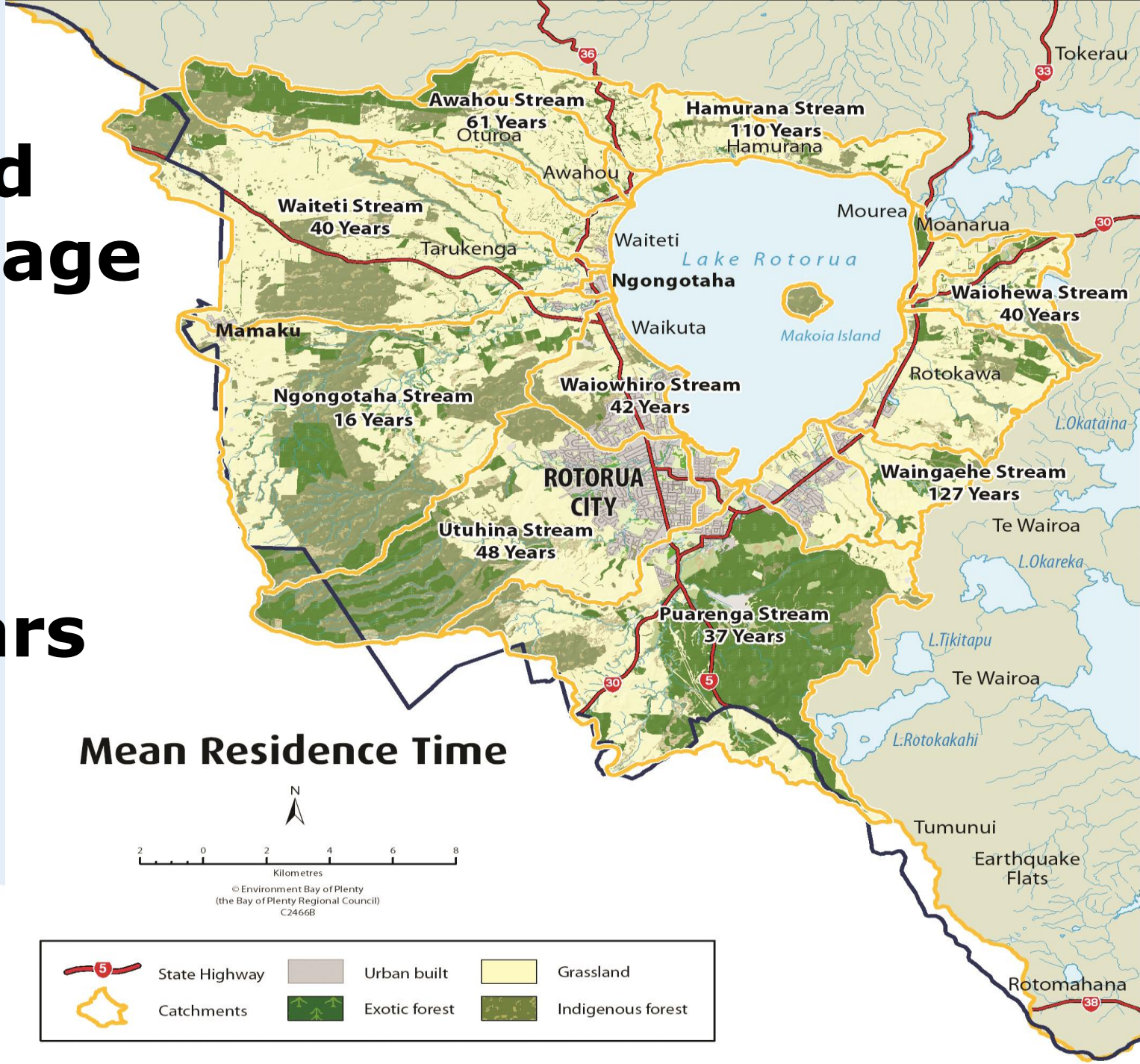

Natural inputs
(residual)
Point source inputs
(sewage/septic)
Diffuse catchment
inputs
(Land use/farming)
Lake Nutrient
Status
Nutrient recycling
from sediments

Lake Rotorua Inputs

	Nitrogen inputs t/yr	% of nitrogen inputs	Phosphorus input t/yr	% of phosphorus input
Forest and bush	70.5	9	2.26	6
Pasture	580	74	17.49	44
Lifestyle and urban	61	8	4.32	11
Springs and geothermal input	42	5	14.4	36
Rainfall	29.2	4	1.33	3
Sediment releases	360	NA	36	NA

Ground water age

60 years



ROTORUA TE ARAWA LAKES PROGRAMME

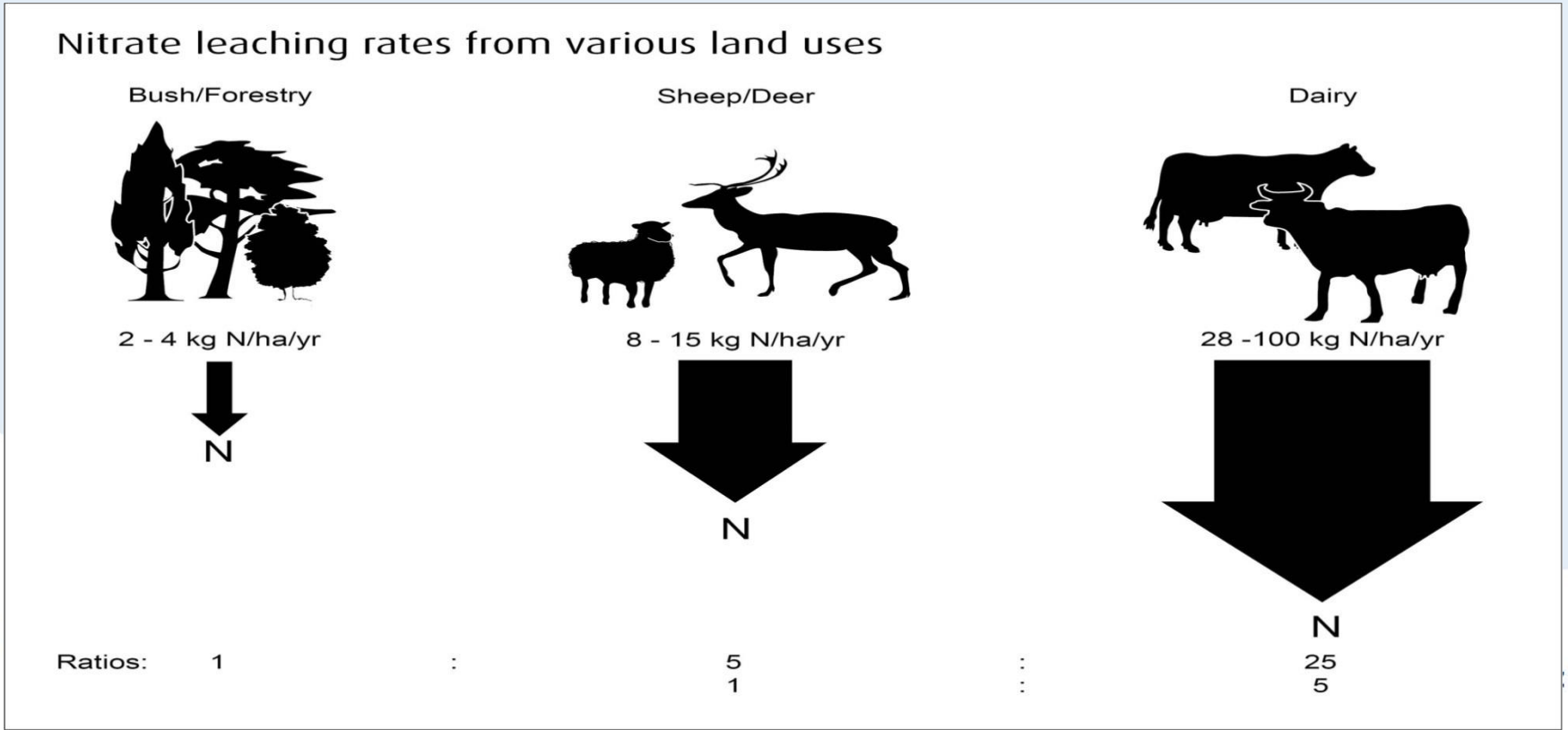
Ohau wall designed to protect Rotoiti

Long term land use change 35 years

Alum dosing has improved Rotorua

Rules notified

Land use incentives



Ohau diversion wall consent process

- Information review (of technical studies undertaken since the wall has been constructed)
- Initial consultation – seeking views
- Draft AEE
- Feedback consultation on effects assessment
- Draft applications
- Further targeted meetings
- Review
- Lodge

Indicative programme

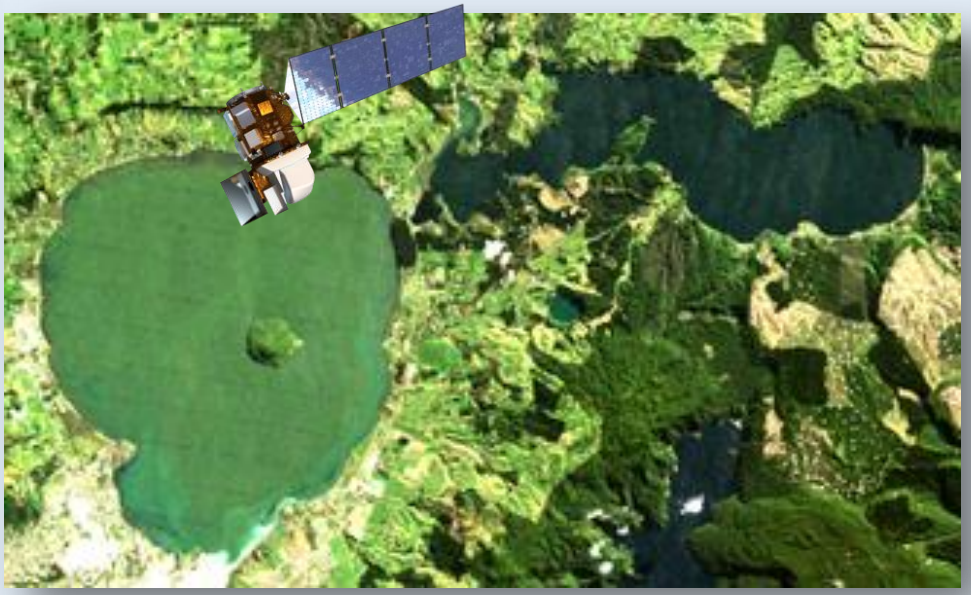
Task	Indicative Programme
Information review	March/April 2016
Initial consultation	April 2016
Draft AEE	May/June 2016
Feedback consultation	July/August 2016
Draft applications	September 2016
Further targeted meetings	September 2016
Review	October 2016
Lodge	October/November 2016

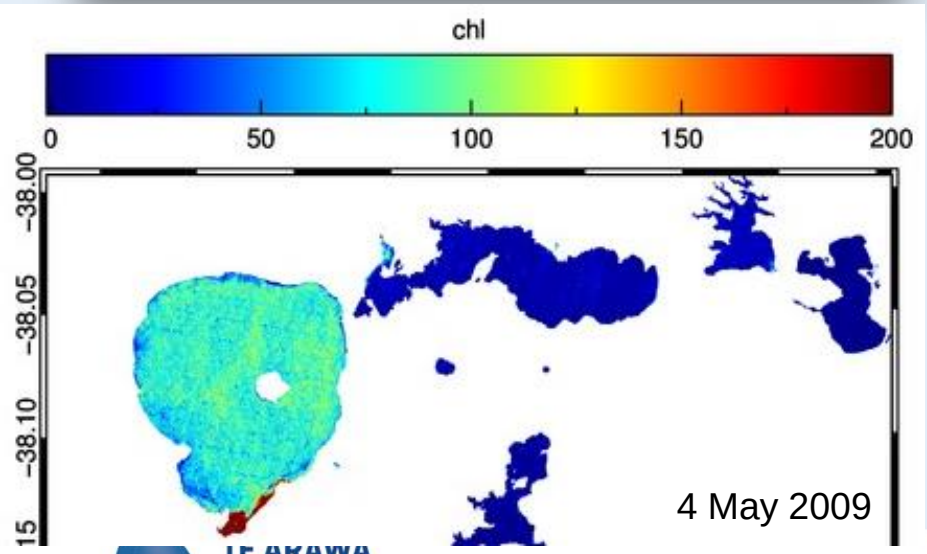
Water quality

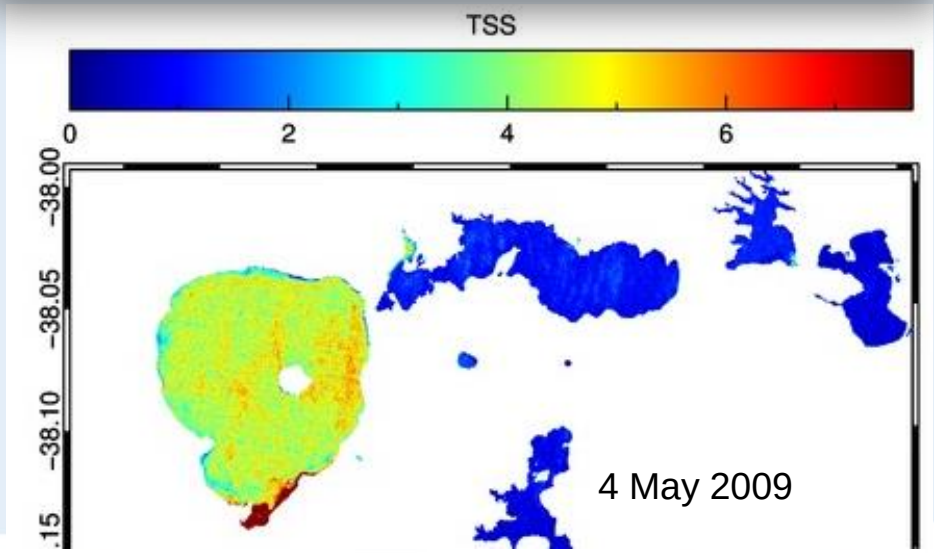
Water quality monitoring at least (as a condition of original consent):

- **Monthly: dissolved reactive phosphorus, total phosphorus, ammoniacal nitrogen, nitrate nitrogen, total nitrogen**
  - at Ohau Channel, Okere Arm, Rotoiti E. B. & W. B., Lake Rotorua, Kaituna River (4 sites), Maketu Estuary;
- **Monthly: suspended sediments at Ohau Channel and Okere Arm**
- **Weekly (from 15 Nov-30-Mar): blue-green algal numbers**
- **Monitoring of algae levels in shellfish if the Kaituna River exceeds health guideline values.**

Preliminary evidence suggests water-quality improvements in Rotoiti since 2008







TE ARAWA LAKES PROGRAMME

Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Lakes Trust.
Working as one to protect our lakes with funding assistance from the Ministry for the Environment.

#love our lakes
rotorualakes.co.nz

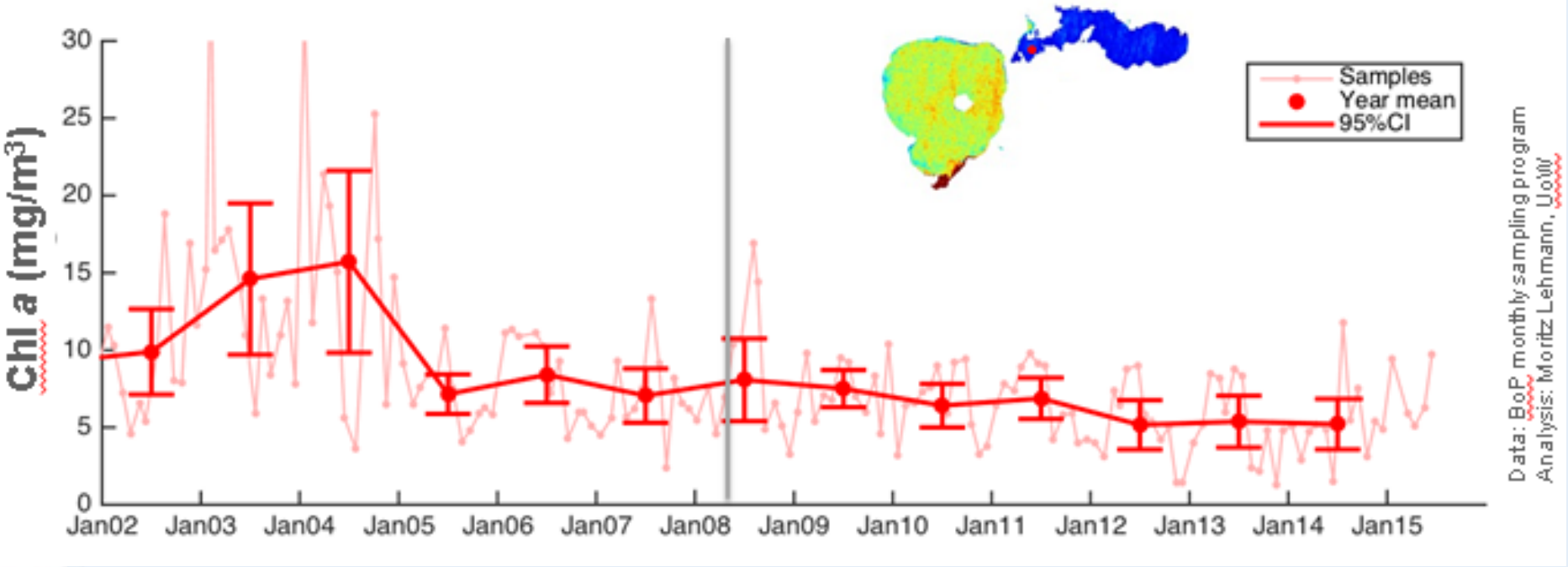
Water Quality on the Kaituna

Water quality on the Kaituna is improving overall

- Faecal coliform (e coli) has reduced
- Total sediments and Phosphorus is stable
- Nitrogen in the lower Kaituna is increasing
- Nitrogen at the Okere gates is reducing and is approximately one eighth of the total river load
    - **It is inconclusive whether this is as a result of the wall or the alum dosing**
- Three sites along the river are monitored as part of the BOPRC Natural Environment Regional Monitoring Network. These sites are all graded better than the national bottom lines for ecosystem health and human health for recreation.

Has the wall done what was expected?

– Early indications are that water quality in Lake Rotoiti has improved



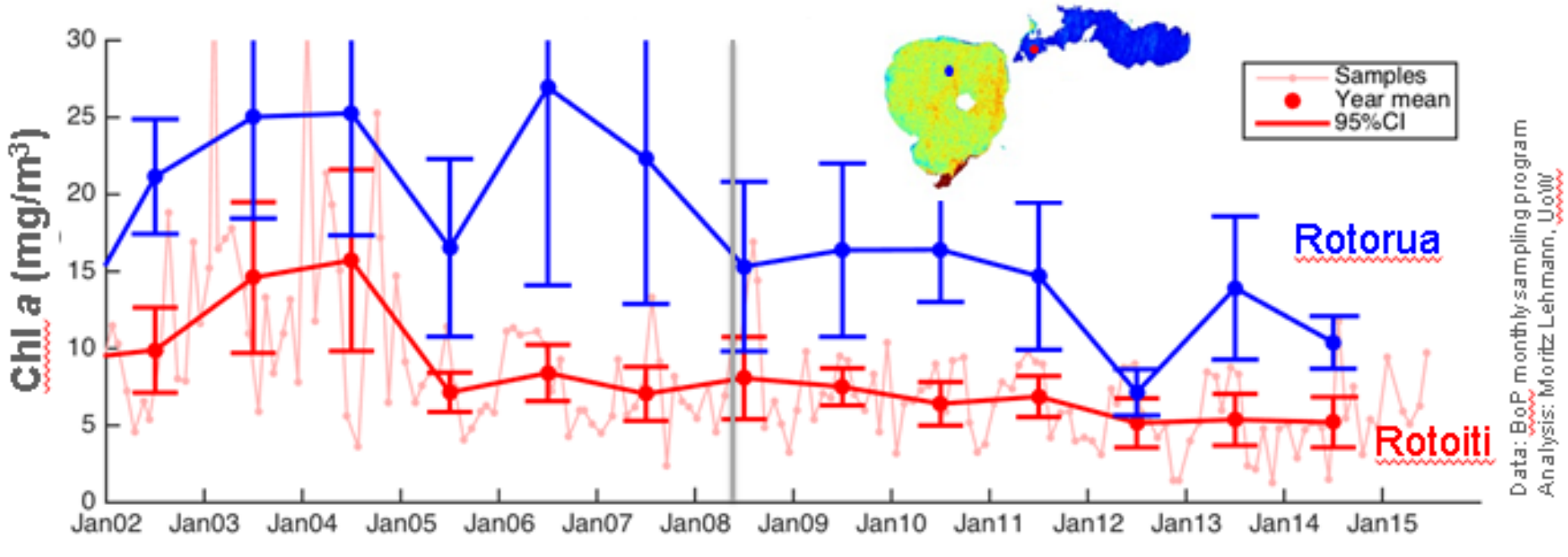
ROTORUA TE ARAWA LAKES PROGRAMME

Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Lakes Trust.
Working as one to protect our lakes with funding assistance from the Ministry for the Environment.

#love our lakes
rotorualakes.co.nz

Has the wall done what was expected?

– Early indications are that water quality in Lake Rotoiti has improved



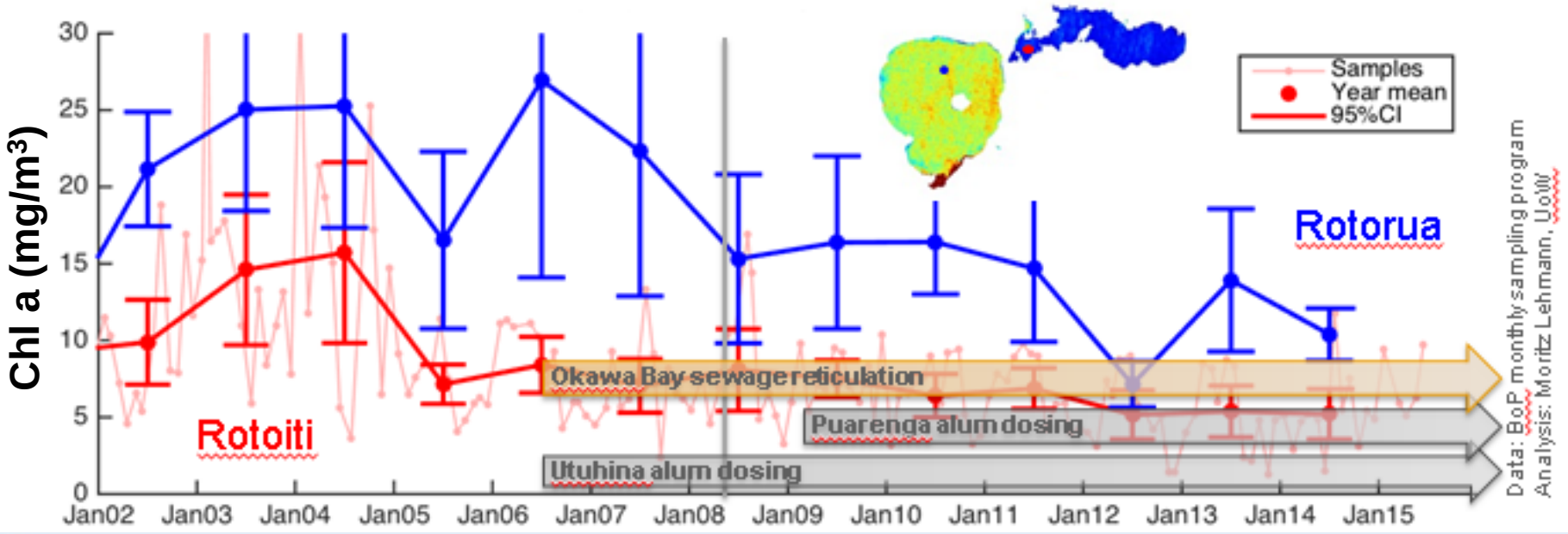
ROTORUA TE ARAWA LAKES PROGRAMME

Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Lakes Trust.
Working as one to protect our lakes with funding assistance from the Ministry for the Environment.

#love our lakes
rotorualakes.co.nz

Has the wall done what was expected?

- Early indications are that water quality in Lake Rotoiti has improved
- This may be due to specific intervention projects besides the diversion wall (e.g., alum dosing of Lake Rotorua)



Before the wall was built…

The risks of construction of the wall to the trout fisheries was unknown, but we speculated that:

1. Rainbow trout and smelt migration between the lakes could be prevented by the wall;
2. Loss of movement of smelt between the lakes could cause the rainbow trout fishery (both wild and hatchery) in Lake Rotoiti to collapse;
3. Fish populations of the Ohau Channel could be reduced by the wall

Our solutions

To answer these questions, we:

- Evaluated trout and smelt movement between the lakes by examining the chemistry of the ear bones (otoliths)
- Did a comprehensive study of trout diet and growth in Lake Rotoiti
- Evaluated whether smelt spawn in Lake Rotoiti
- Conducted regular fish monitoring in the Ohau Channel, starting in 2007, the year before wall closure (June 2008) – results to 2015

Conclusions

1. The wall has not prevented trout movement between the lakes

   - **Rainbow trout moved freely between the lakes before wall construction and continue to do so after wall construction**
   - **Before the wall the main spawning streams for wild Rotoiti rainbow trout were tributaries of Lake Rotorua**
   - **Majority of wild Rotoiti rainbow trout still come from Rotorua**

Conclusions

2. Common smelt movement was more difficult to establish by otolith microchemistry but the two lakes appear to have independent smelt reproduction

- **Beaches in Lake Rotoiti, especially at its eastern end, support smelt spawning adequate to maintain the smelt population in the lake**
- **Trout production in Rotoiti (wild and hatchery fish) is not dependent on the movement of smelt from Lake Rotorua**

3. Fish abundance in the Ohau Channel is quite variable

- **does not appear to have been affected by wall construction**
- **not a strong conclusion because we have only a single year of monitoring before wall was completed**

Avifauna

What avifauna studies have been undertaken?

- **Monitoring of avifauna for 5 years as a condition of consent**
- **Voluntarily extended by Council**

What have been the effects of the wall on avifauna?

- **Indications are that after local disruption during construction the avifauna populations in the vicinity of the wall have remained healthy and stable**
- **The wall provides a new roosting area for some species**

Corrosion

- Council have adopted a monitor and maintain approach to corrosion on the wall
- The consent application needs to address the effects of maintenance as required
- Consent conditions to include provision for maintenance.

ROTORUA TE ARAWA LAKES PROGRAMME

Bay of Plenty Regional Council, Rotorua Lakes Council and

Working as one to protect our lakes with funding assistance

Next steps

Preparation of consent application

- **Take into account consultation issues and concerns**
- **Scientific analysis of monitoring results**
- **Reporting back before finalising application**

ROTORUA TE ARAWA LAKES PROGRAMME

Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Lakes Trust.
Working as one to protect our lakes with funding assistance from the Ministry for the Environment.

#love our lakes
rotorualakes.co.nz

Contact details for feedback

Keith Frentz, Beca
027 230 9209
keith.frentz@beca.com

Genevieve Doube, Beca
027 213 3152
genevieve.doube@beca.com

http://www.rotorualakes.co.nz/ohau-diversion-wall-research