

The State of the Waikato Shallow Lakes



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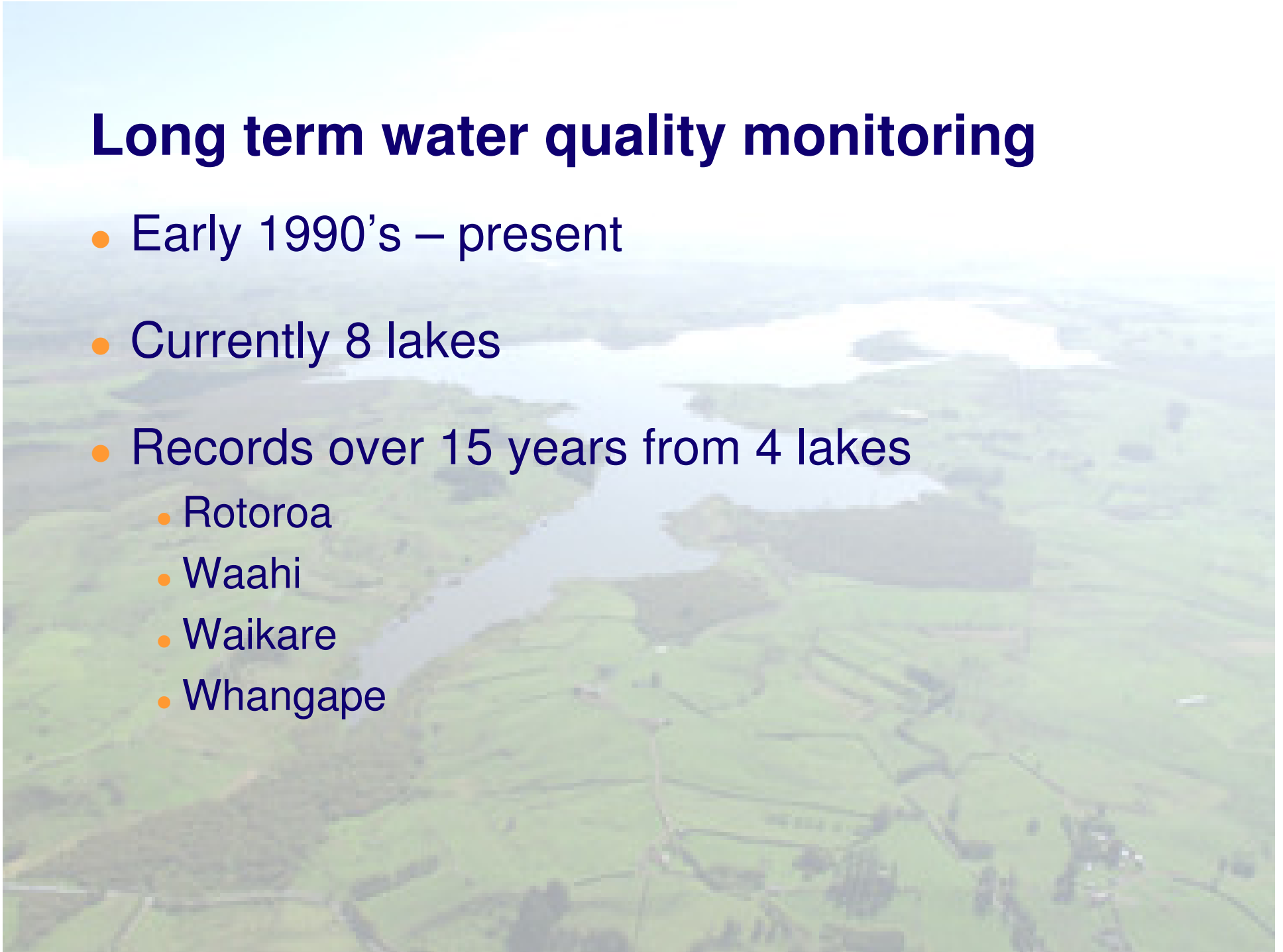
Our shallow lakes

- Lakes < 15 m deep
- Approximately 63 named lakes
 - Peat
 - Riverine
 - Dune
 - Volcanic

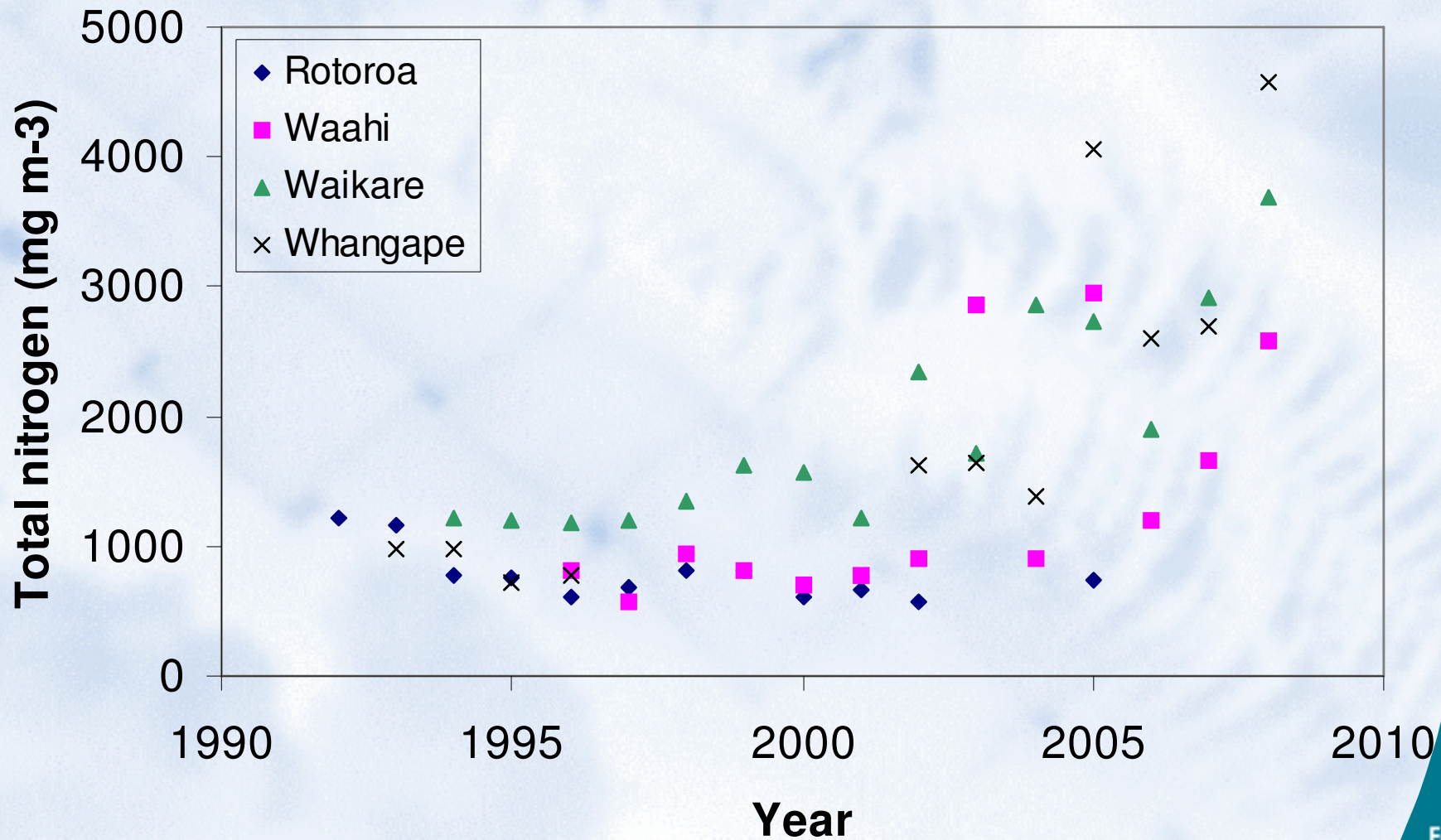


Long term water quality monitoring

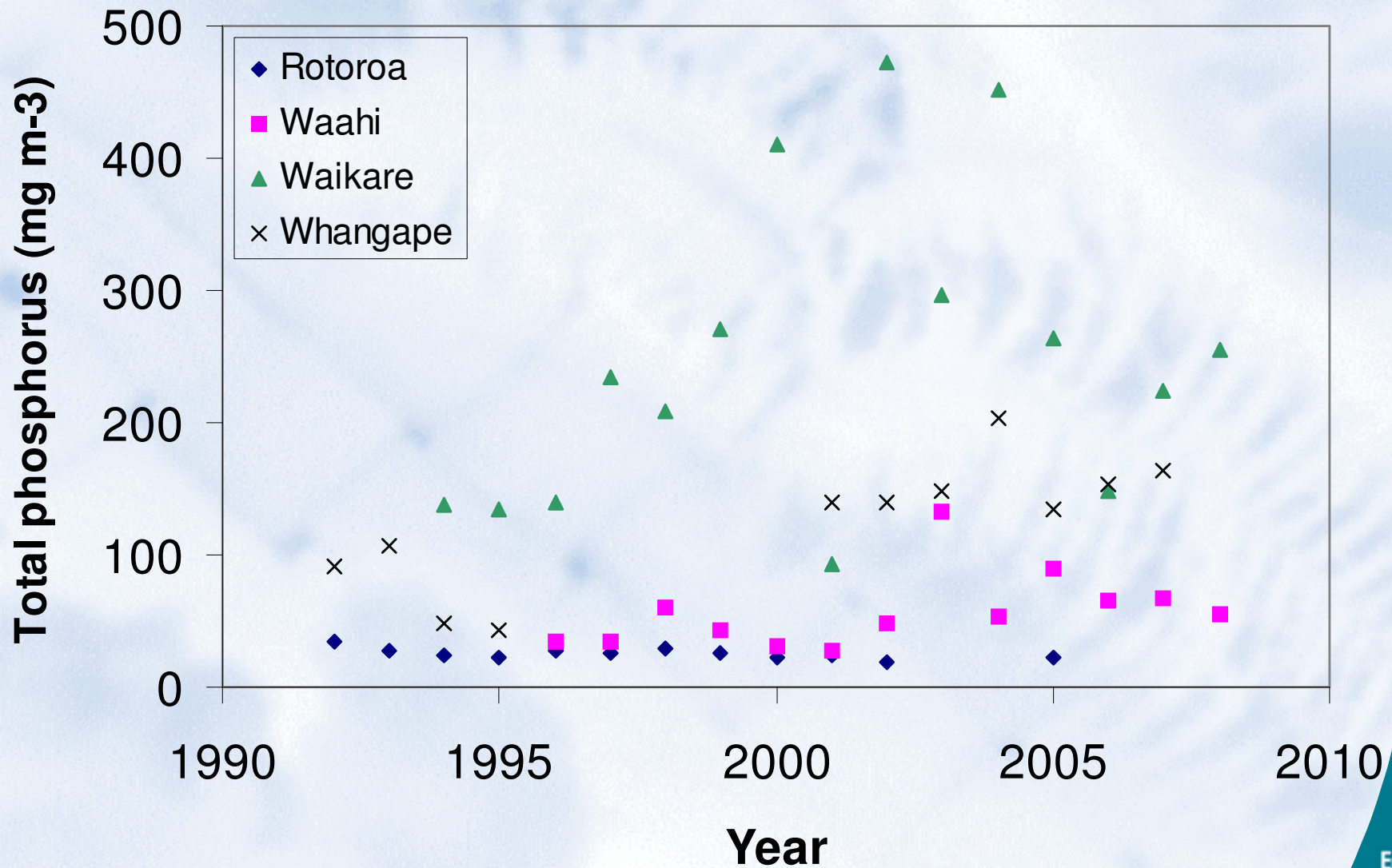
- Early 1990's – present
- Currently 8 lakes
- Records over 15 years from 4 lakes
 - Rotoroa
 - Waahi
 - Waikare
 - Whangape



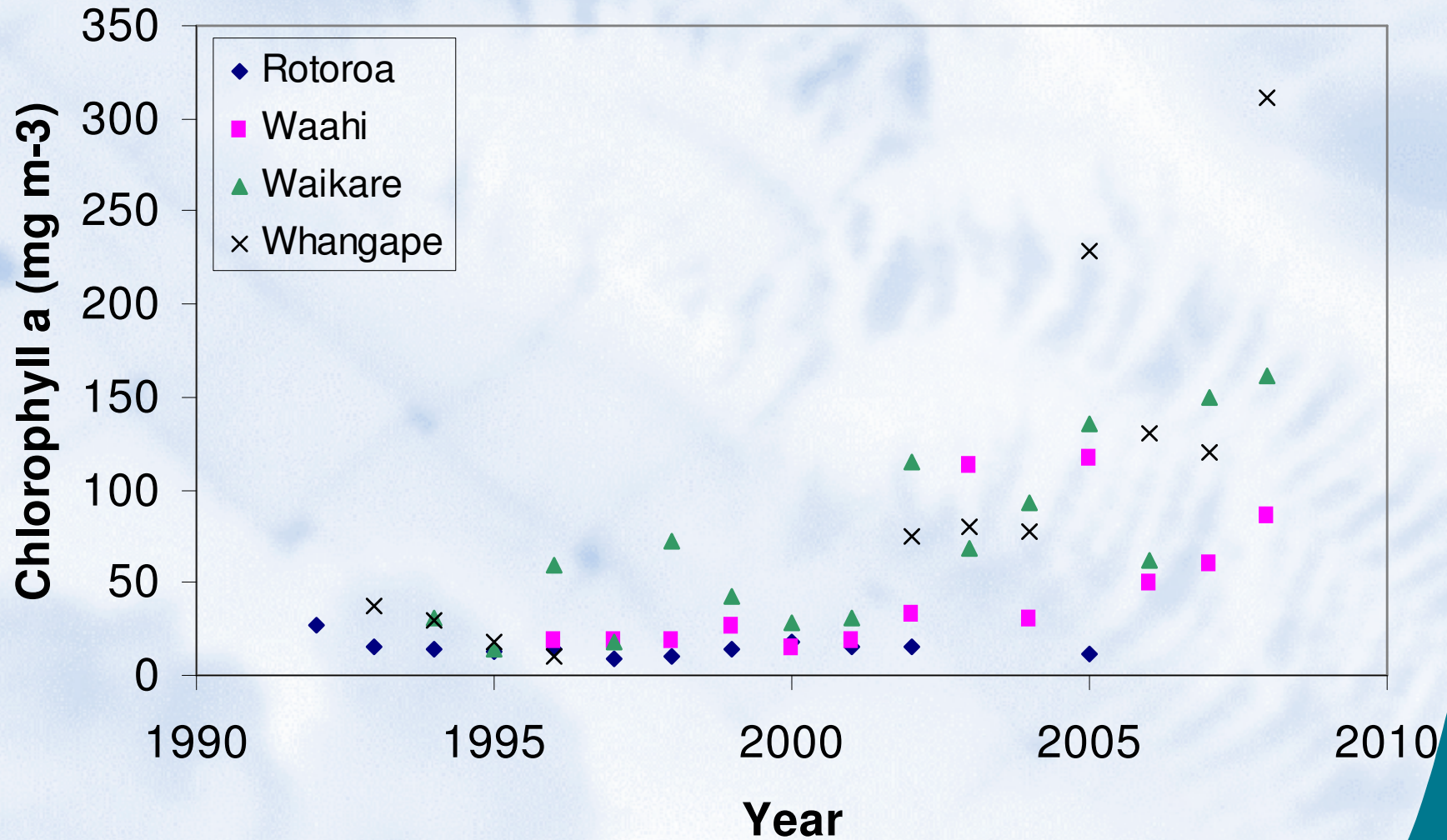
Total nitrogen



Total phosphorus

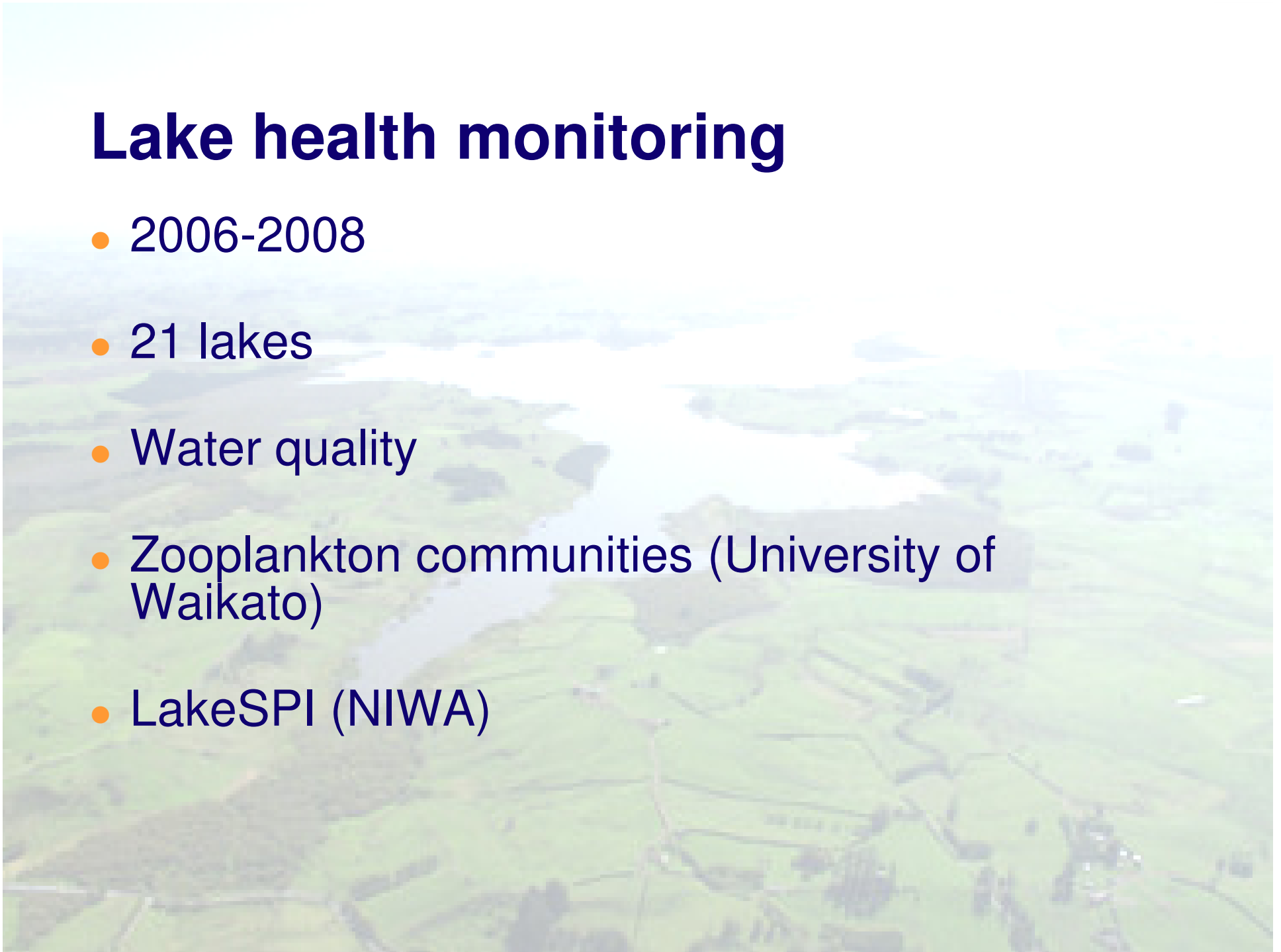


Chlorophyll a



Lake health monitoring

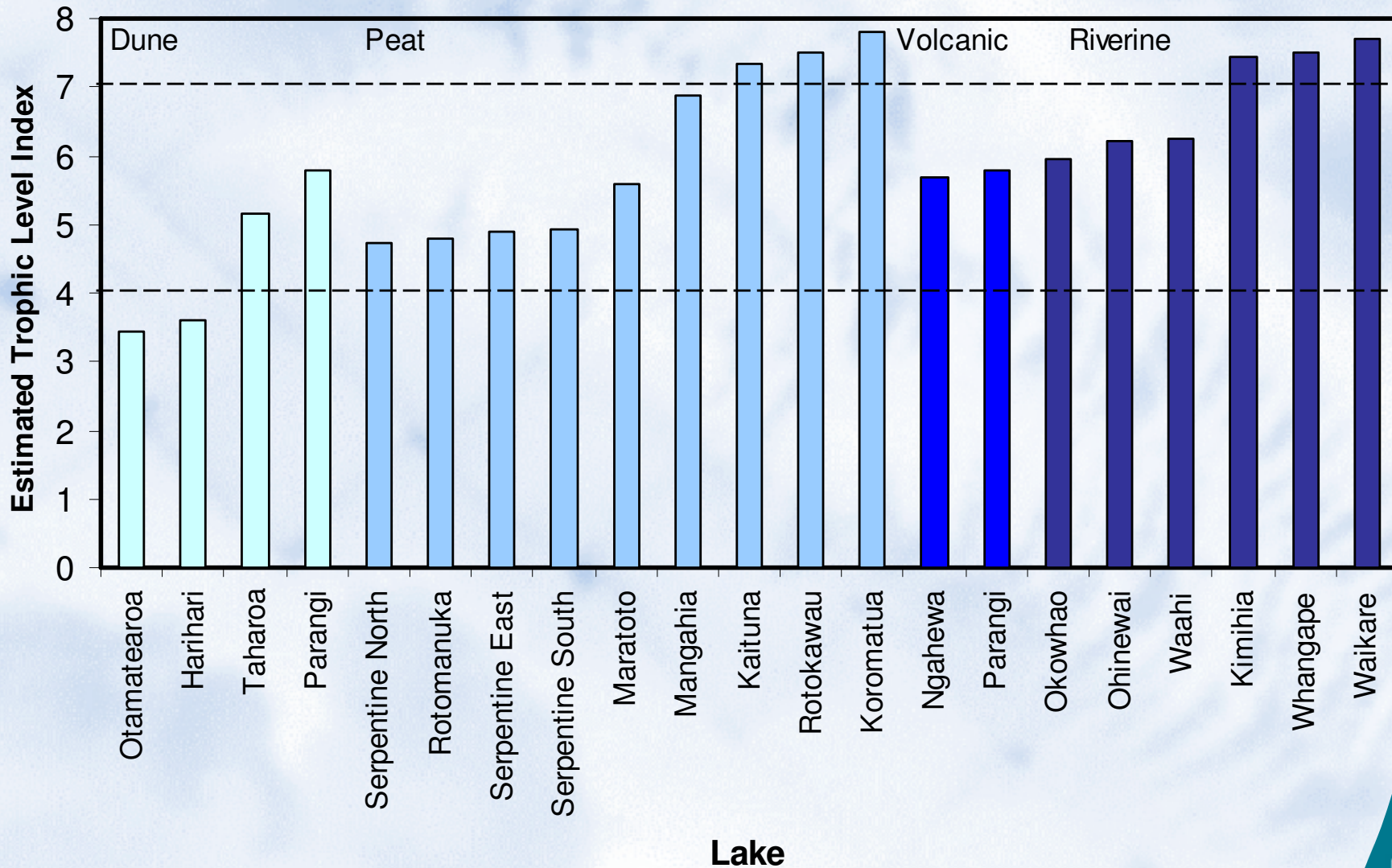
- 2006-2008
- 21 lakes
- Water quality
- Zooplankton communities (University of Waikato)
- LakeSPI (NIWA)



Water Quality - Trophic Level Index

- Oligotrophic 2.0 – 3.0
 - Clear with low levels of nutrients and algae
- Mesotrophic 3.0 – 4.0
 - Moderate levels of nutrients and algae
- Eutrophic 4.0 – 5.0
 - Green and murky with high nutrients and algae
- Super/Hypertrophic 5.0 – 7.0
 - Very fertile with extremely high concentrations of nitrogen and phosphorus

Current water quality of 21 lakes (TLI)



Summary of current water quality

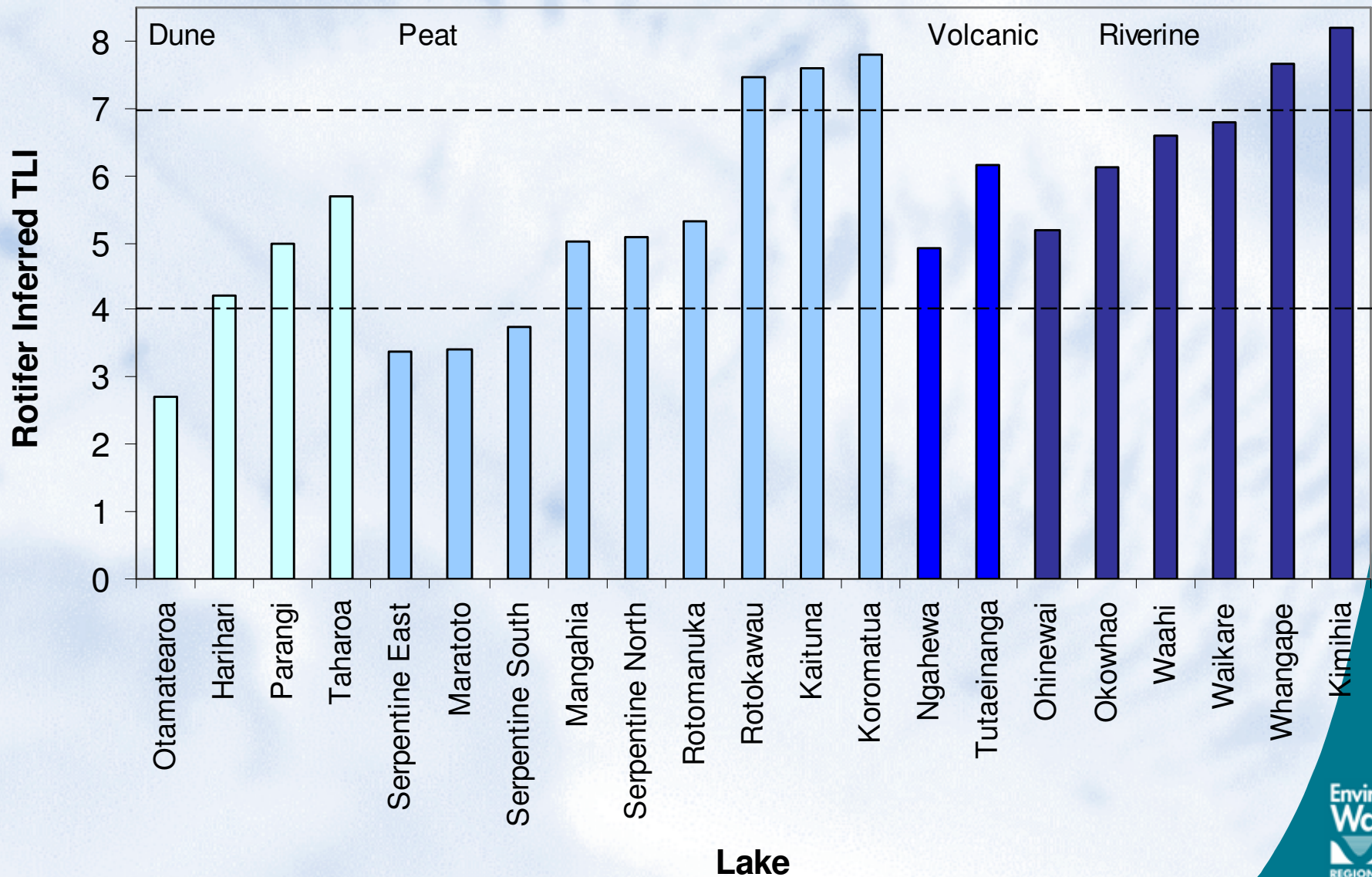
- 2 mesotrophic lakes – both dune (10%)
- 13 lakes of all types are eutrophic to hypertrophic (62%)
- 6 lakes with a TLI worse than hypertrophic (28%)

Zooplankton

- Important in controlling algal populations in lakes
- Shown to be a useful indicator of lake water quality
- Indicate lake conditions before and up to the sampling point
- Results displayed as an index – Rotifer Trophic Level Index



Zooplankton communities in 21 lakes



Summary of zooplankton results

- 4 lakes mesotrophic or better (19%)
- 12 lakes of all types are eutrophic to hypertrophic (57%)
- 5 lakes with a TLI worse than hypertrophic (24%)

Aquatic plants - LakeSPI

- Aquatic plant communities are a very important aspect of lake health
- NIWA - SCUBA surveys of 5 transects of lake bed
- Data used to generate scores native, invasive and overall aquatic plant communities
- 39 Waikato shallow lakes surveyed
- Lakes have been categorised:
 - Excellent - >80%
 - Satisfactory – impacted vegetation or weed invasion
 - Unsatisfactory – essentially devegetated

Aquatic plant communities



Aquatic plants - LakeSPI

- The 3 Serpentine lakes have retained close to pristine native plant communities. The only lakes ranked as 'Excellent'.
- Peat and riverine lakes have shown greatest deterioration. 78% of those surveyed have now devegetated.
- Dune and volcanic lakes have deteriorated more slowly with 9 out of 10 lakes surveyed still retaining some vegetation.

Summary

- Waikato shallow lakes have undergone marked deterioration since the 1970s.
- Many now devegetated and with poor water quality
- BUT.....
- It could be a lot worse
- We still have a number of beautiful shallow lakes in the Region

Lake Harihari



Lake Maratoto



Photo: NZ Landcare Trust

Serpentine Lakes



Summary

- AND...
- Even those that are deteriorated retain multiple values
 - Biodiversity / threatened species
 - Cultural
 - Recreational
 - Lakes and wetlands are a rare habitat type

Acknowledgements

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