



FNDC Wastewater Treatment Plant Hearing



Dr Kēpa Morgan DFEngNZ Pou Hautū
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Qualifications

- Distinguished Fellow of Engineering NZ
- Completed doctorate on municipal three waters and contribution of mātauranga 2008
- MMDMF provides mauri based understanding
- Charter Professional Engineer
- University Academic and Fulbright Scholar
- Strategic Science Advisory Panel for ESR
- 40 year involvement in improving outcomes
- Advisor to Iwi and Government



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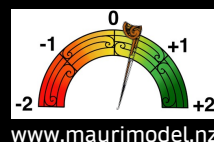
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Main Points

- Relevance of Te Mana O Te Wai
- E-coli / bacteria not the full understanding
- Emerging Contaminants 2018
- Mauri Model Decision Making Framework
- Cawthron Report
'relevant regardless of community'
- Aashukan Declaration



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THE AOTEAROA-NZ STRATEGY¹ FOR EMERGING CONTAMINANTS

PATUA TE TANIWHA KEI
TAMARIKI TONU

Assail the Leviathan
whilst it is young

Emerging Contaminants
Advisory Panel²

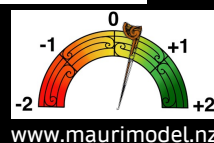
December 2018



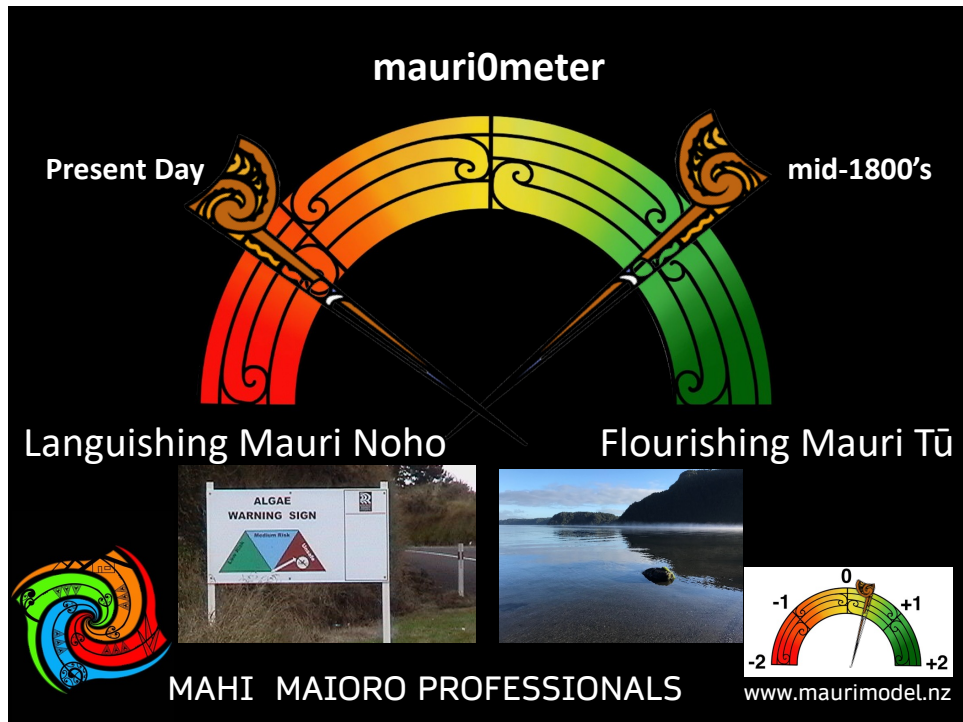
The effects of emerging contaminants on people, ecosystems and livelihoods are being documented elsewhere in the world. However, in Aotearoa-NZ research and information about emerging contaminants is limited and un-coordinated. There are currently few studies examining their role and transport in our ecosystems, or food chains and the risk they pose to our economic and cultural wellbeing. We need to move quickly and purposefully to understand current effects and how to manage these and any future risks.



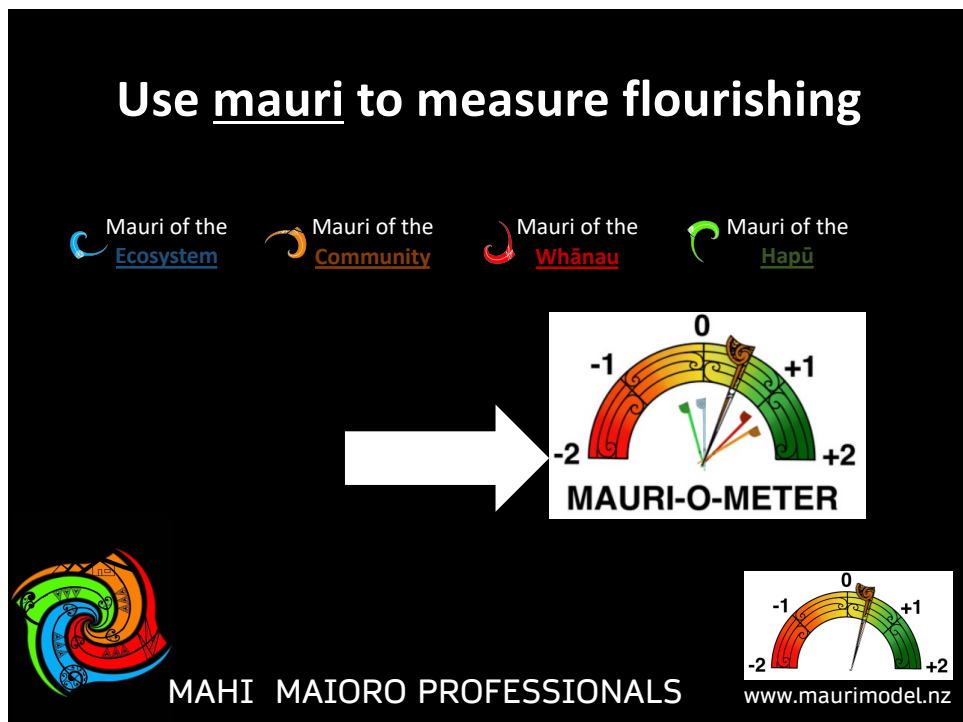
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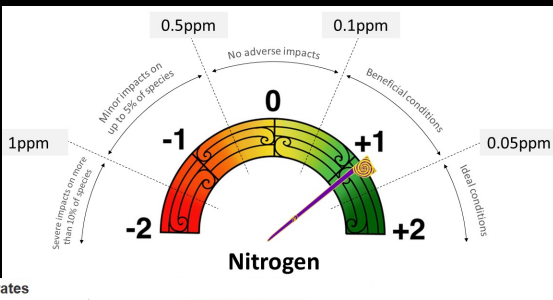
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Communicate Change Occurring:

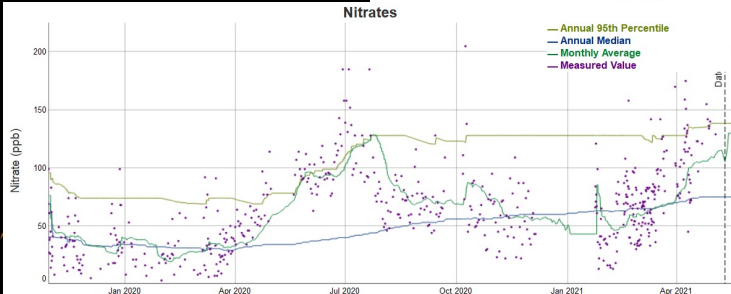
Present information from perspective of Te Ao Māori (right) from empirical data or averages (below).

Thresholds are set based on:

- How Nitrogen impacts on mauri
- How Nitrogen is measured
- Consider national guidelines
- Consider published studies
- Observed inter-relationships

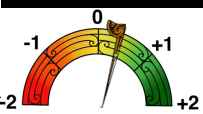


Nitrogen



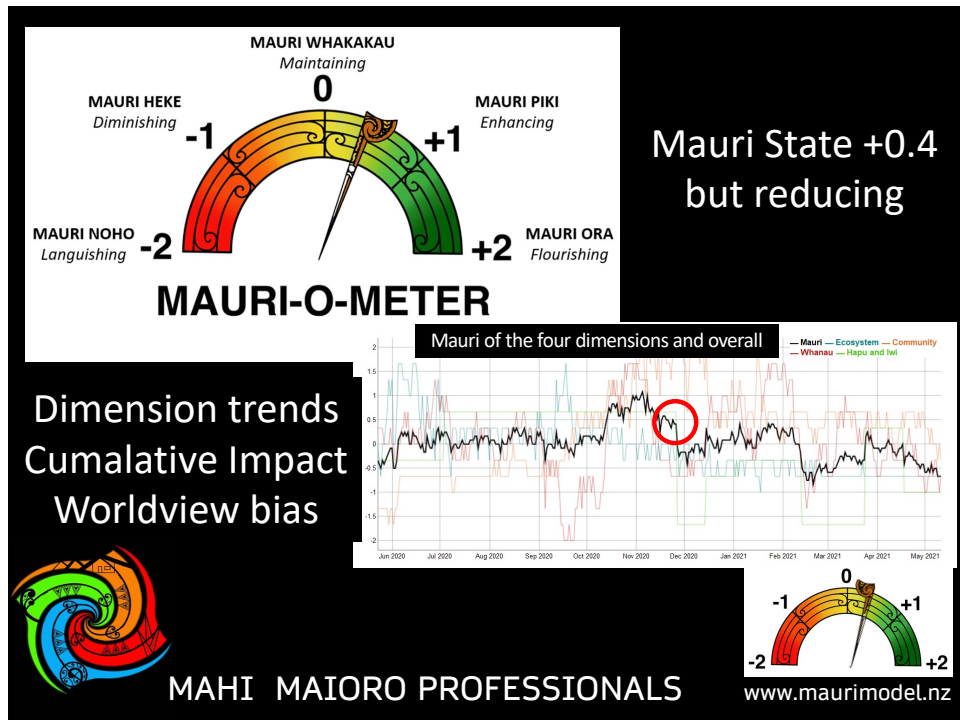
Nitrates

— Annual 95th Percentile
— Annual Median
— Monthly Average
— Measured Value



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Ko te mauri matangaro e kore e kite,
inā rā, ka mātanga te ine i tēnei mea te mauri, ka mātua te Iwi.
Ko te mauri kia oho, ko te mauri kia tū,
ko te mauri kia ora, kia matāra!

When mauri becomes our intuitive way of knowing,
our people and our ways will flourish.
Let the mauri be revitalized, let the mauri flourish,
strive for this persistently.

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