TTRL Hearing

Climate Justice Taranaki, ... April 2024

www.climatejusticetaranaki.info

A trichotomy of ‘opinion’?

- Most experts agree that oceanographic conditions are changing rapidly from climate and related disruptions. Species increasingly threatened with extinction. Inference: cumulative harm ‘material’.
- Opinions for TTRL maintain a) BAI adequate; b) mining effects will not increase harm ‘materially’ c.f. large-scale present and future oceanographic effects.
- Opinions for KASM, GP, F&B and fishers maintain a) BAI inadequate with sig. uncertainties; b) mining will likely add ‘material harm’ to that already occurring.
- ‘Opinions’ of the species present? A voice for marine mammals, seabirds, fish, plankton, reef spp.? What would they say?

Is our offshore Regulatory Regime fit for purpose re obligations for conservation & sustainable use?

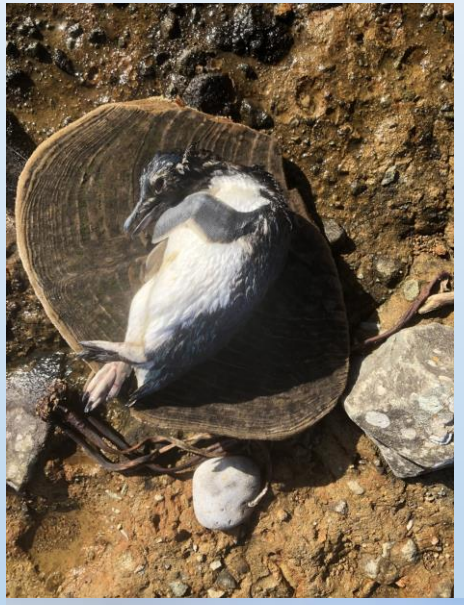
How are we doing? *Status quo*:

- 90 % of indigenous seabirds
- 82 % of shore birds
- 81 % of assessed marine invertebrates
- 22 % of marine mammals

Threatened or at risk of extinction

Statistics New Zealand and MfE 'Our Marine Environment 2022'.
https://environment.govt.nz/publications/our-marine-environment-2022/

6th Mass Extinction gaining pace



Ecological and biodiversity values. Patea Shoals

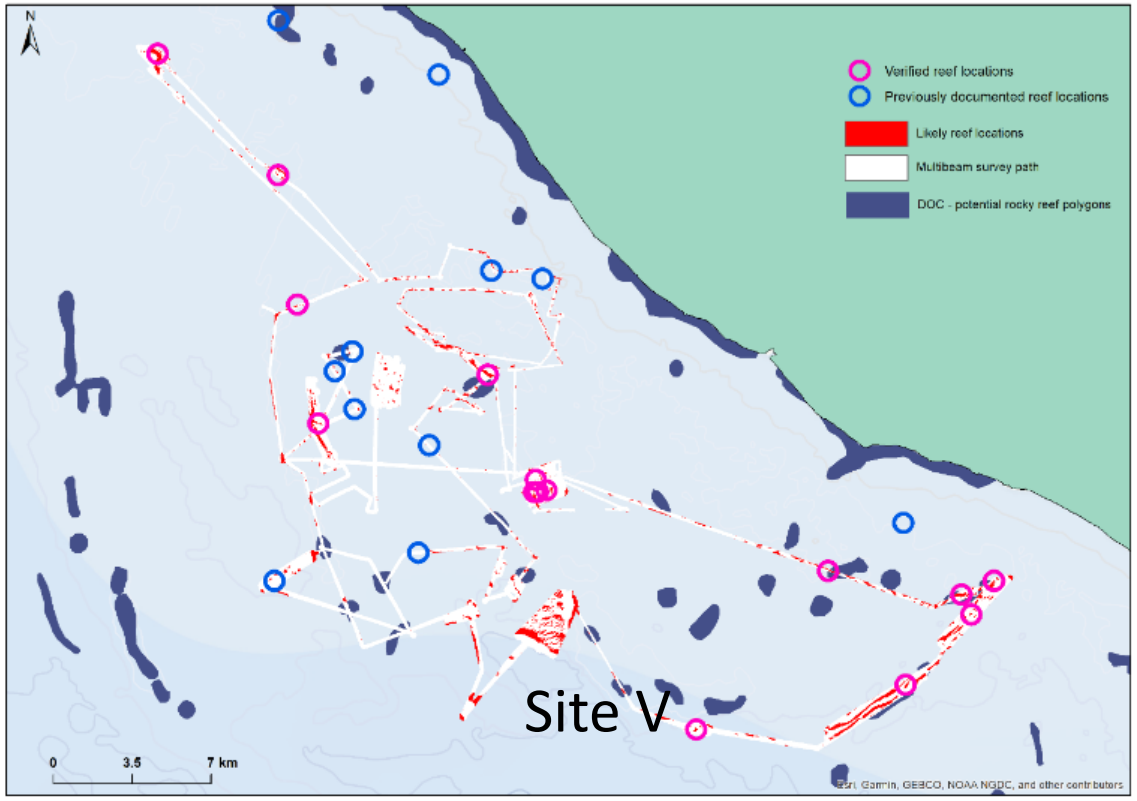


Figure 4-1: Known and likely reefs (by science survey) of Pātea Bank circles denote reefs verified with cameras, red polygons are other likely reefs encountered during multibeam sonar mapping, and the blue polygons putative reefs from DOC assessment of abrupt bathymetric changes on old fairing sheets.

Surveys by NIWA in South Taranaki Bight reported new species of bryozoans, sponges, annelids, and algae, and new records for many groups for the region. NIWA surveys in 2021 focused on Patea Bank, near the TTRL proposal found subtidal reefs are common, with many more awaiting discovery ...”

https://dc.niwa.co.nz/niwa_dc/srv/api/records/efa4d0c1-ffe5-3540-36ca-e8085a768fdf; https://www.trc.govt.nz/assets/2238-TRC002-FINAL-Offshore-subtidal-rocky-reef-habitats-on-Patea-Bank-South-Taranaki-2.pdf

Ecological and biodiversity values. Benthos & fishes

"… Associated with these reefs are extensive areas of biogenic habitat, dominated by macroalgae (notably *Ecklonia* forests, *Caulerpa* meadows, mixed macroalgal meadows, and soft bryozoan fields), … sponge garden …The associated fish assemblages are abundant, dominated by blue cod, scarlet wrasse, butterfly perch, leatherjackets and tarakihi, with other fisheries species likely to be common (e.g., snapper, trevally, kingfish, and kahawai). … providing important nursery habitat …They are worthy of careful management by the TRC, and other governance entities."

https://dc.niwa.co.nz/niwa_dc/srv/api/records/efa4d0c1-ffe5-3540-36ca-e8085a768fdf
https://www.trc.govt.nz/assets/2238-TRC002-FINAL-Offshore-subtidal-rocky-reef-habitats-on-Patea-Bank-South-Taranaki-2.pdf

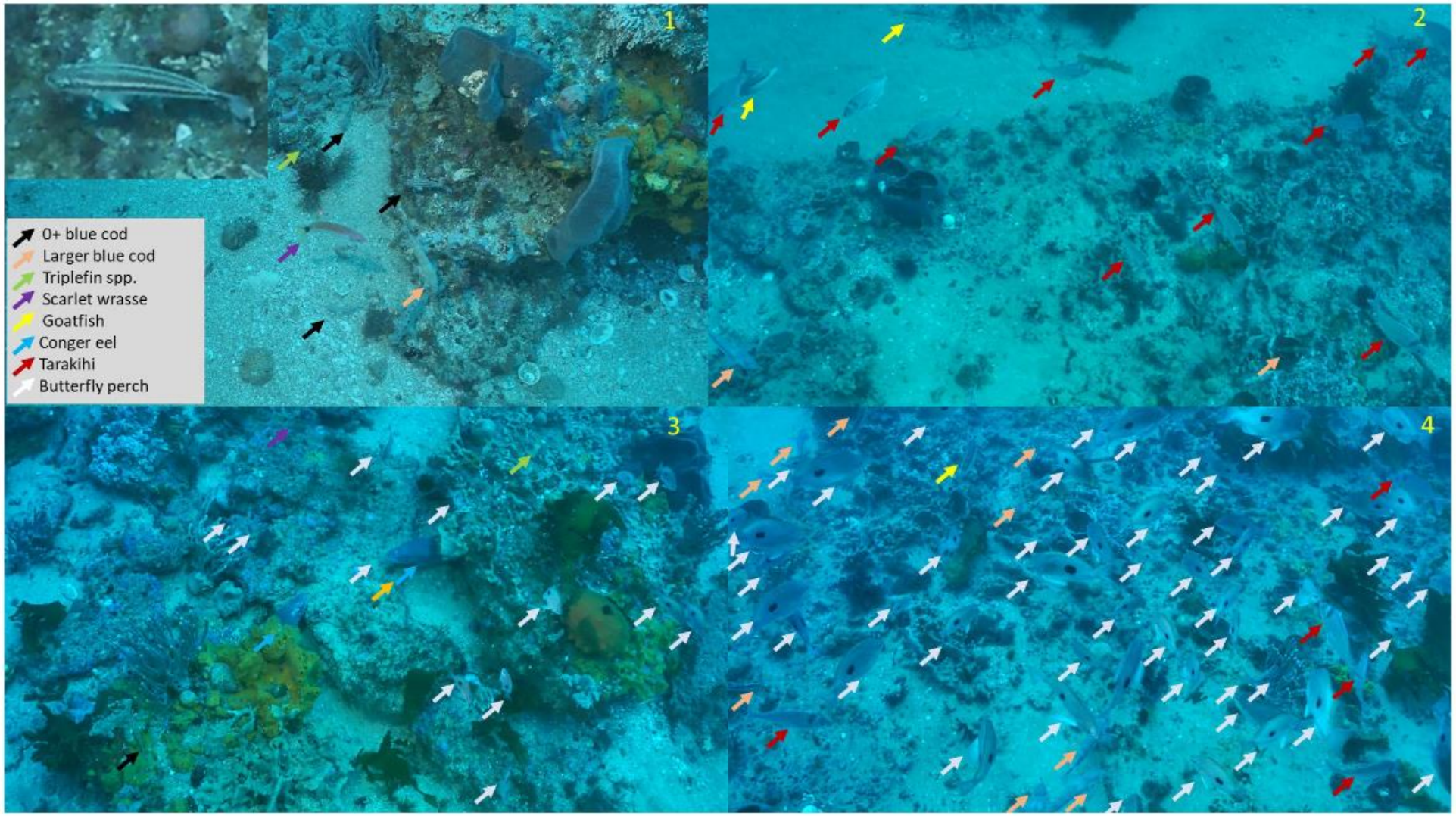


Figure 3-6: Fish examples from Site V, for reef #V1, 32 metres water depth Individual species are marked by coloured arrows: 1) soft sediment to reef boundary with sponge biogenic habitat, and 0+ juvenile blue cod (insert: close-up of 0+ black & white colouration), blue cod, triplefin, scarlet wrasse; 2) reef and soft sediment channel with sponge biogenic habitat, tarakihi school, goatfish, blue cod (an adult blue moki is out of shot); 3) reef/sand mosaic area with sponge and *E. radiata* biogenic habitat, 0+ blue cod, conger eels, scarlet wrasse, triplefin, and juvenile butterfly perch (school on moving video); 4) rock platform with sediment, sponge and *E. radiata* biogenic habitat, school of adult butterfly perch, tarakihi, goatfish, and tarakihi.

Not expert opinion or model

Benthos & fishes

Photos from Morrison et al. (2022) Offshore subtidal rocky reef habitats on Pātea Bank, South Taranaki

Prepared for Taranaki Regional Council

Ecological and biodiversity values. Seabirds

Aotearoa New Zealand - world's seabird 'capital'

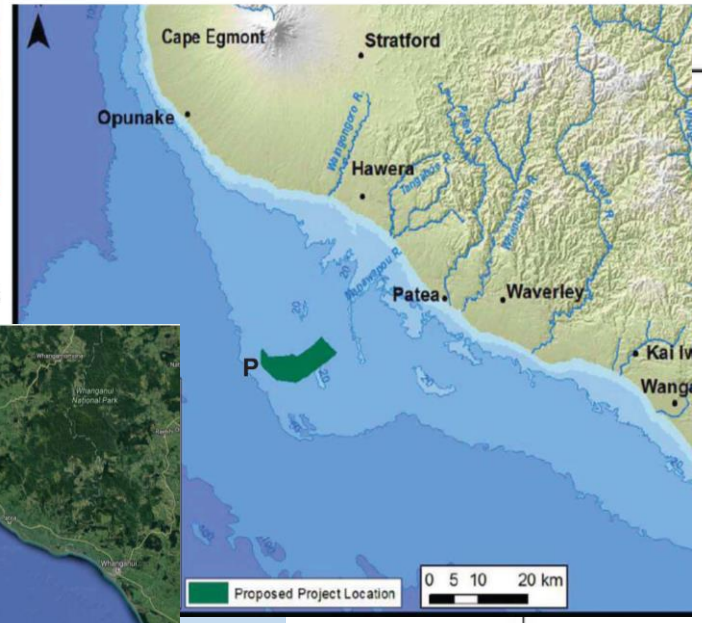
"The seabird assemblage utilising the proposed mining area and adjacent areas in the STB, and how this might vary seasonally, remains to be quantified."

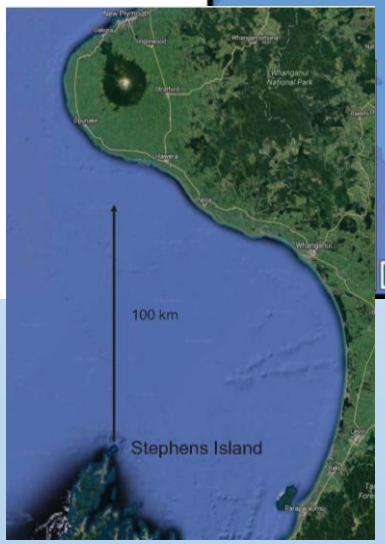
EXPERT EVIDENCE OF DR DAVID THOMPSON ON BEHALF OF TRANS TASMAN RESOURCES LIMITED 19 MAY 2023

But Patea Shoals and adjacent waters are important feeding grounds for Korora and Fairy prions, and …

Fairy prion

P =100 000 prions

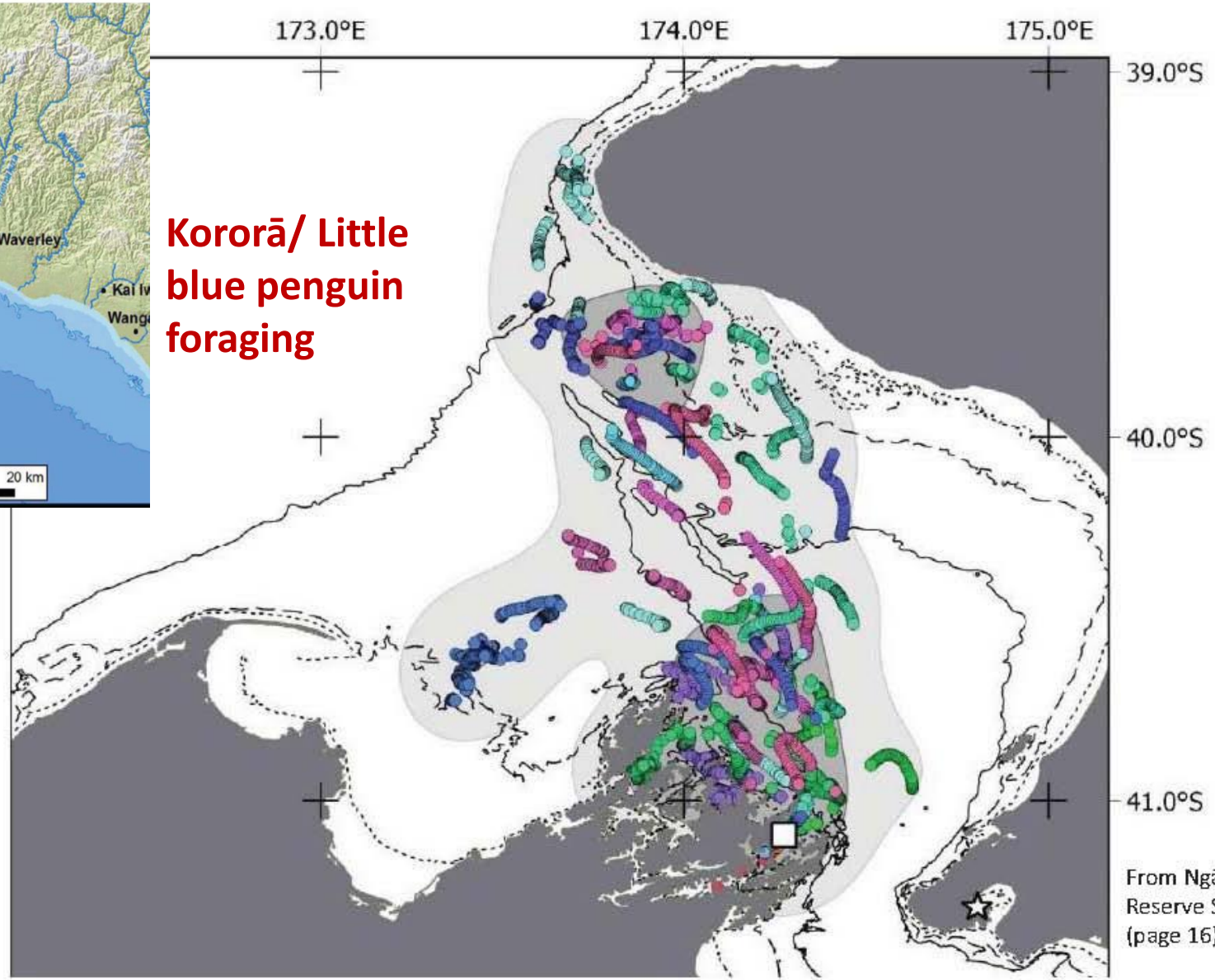




Source: Presentation by expert witness J. Cockrem at EPA TTR seabed mining reconsideration hearing, 15 March 2024

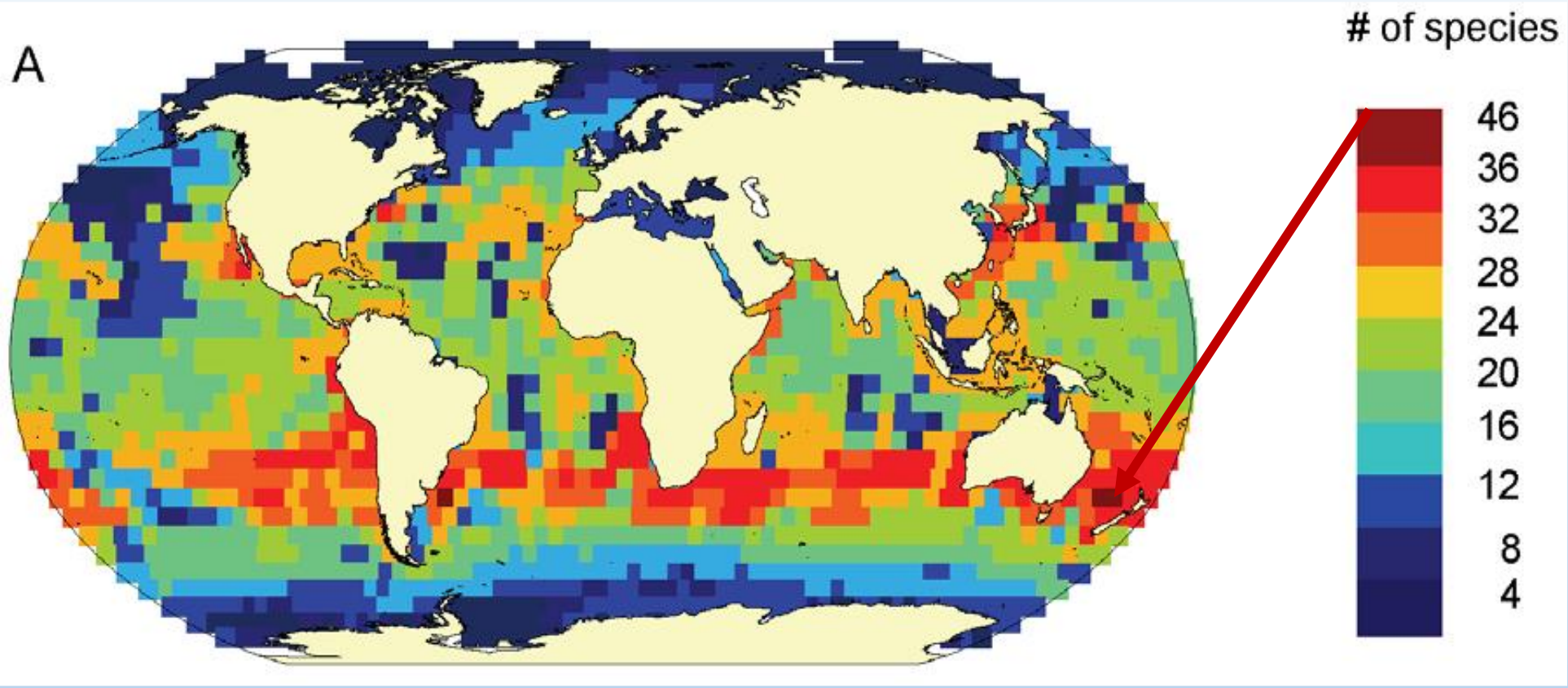
Foraging trips completed by fourteen little blue penguins tagged at Motuara Island, Marlborough, during the incubation period in Spring 2015. Eleven of the fourteen penguins foraged in waters off South Taranaki. These data are Te Papa copyright and summarised in Poupart et al. (accepted for publication in NZ Journal of Zoology).

Kororā/ Little blue penguin foraging



From Ngā Motu Marine Reserve Society Submission (page 16).

Ecological and biodiversity values. Marine mammals



STB & Tasman Sea world marine mammal diversity hotspot

Kaschner et al. (2011) Figure 4. Validation with empirically observed marine mammal occurrences (56x56 cells, 1990–1999). A. Predicted species richness of all cetaceans.

MacDiarmid (2023): "… limited range of some species, areas of overlapping species distribution, … inshore areas in the STB were … among the top 5% for cetacean conservation value in the New Zealand region inside the EEZ boundary and the STB as a whole in the top 15% of areas."

Conservation initiatives

W coast N Isl. Marine Mammal Sanctuary - offshore to 12 nm territorial sea boundary

2020 Variations to the sanctuary

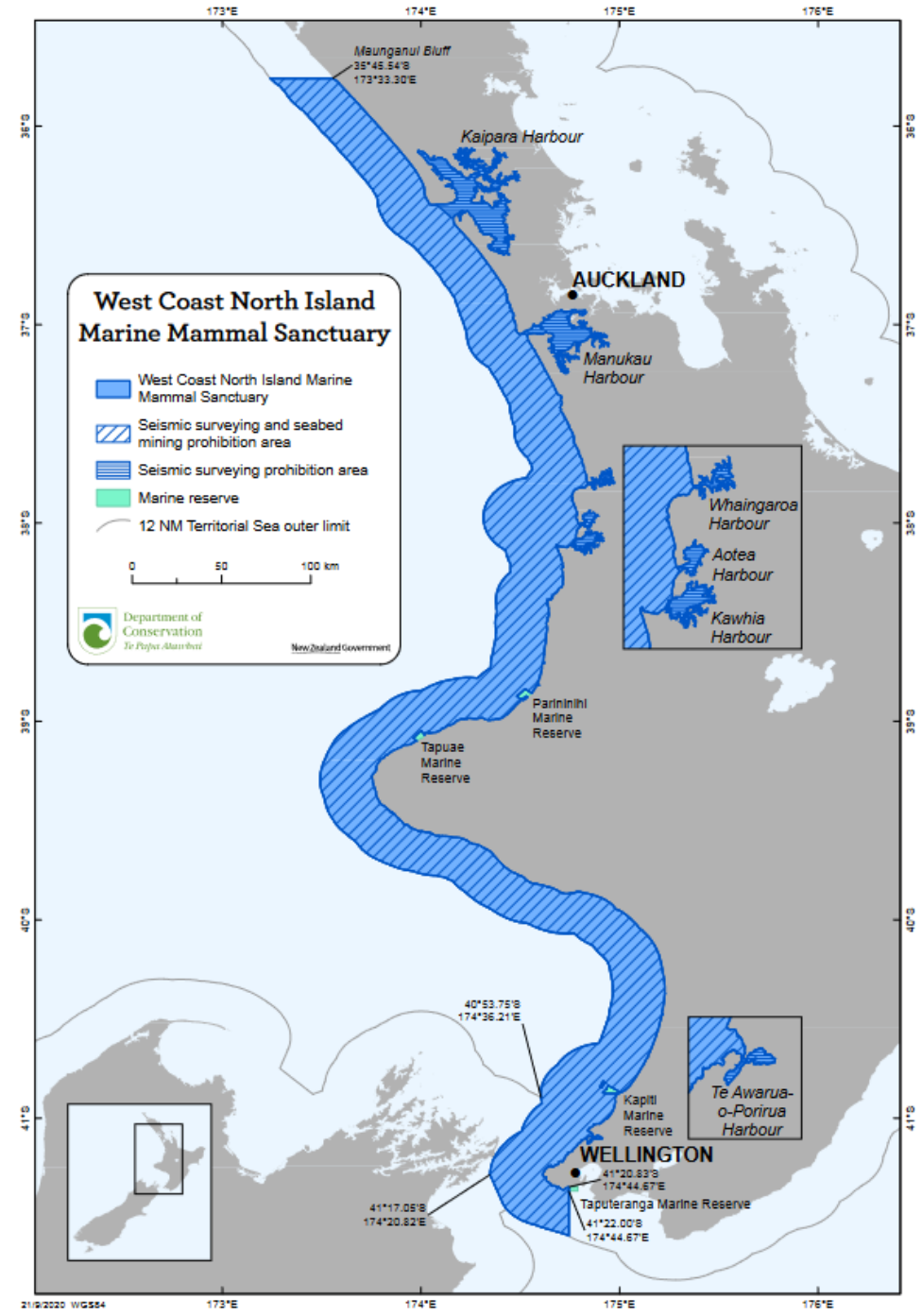
- extending the southern boundary
- ban on seabed mining **with an exemption for existing exploration and mining permits**

ban on seismic surveying with exemptions …

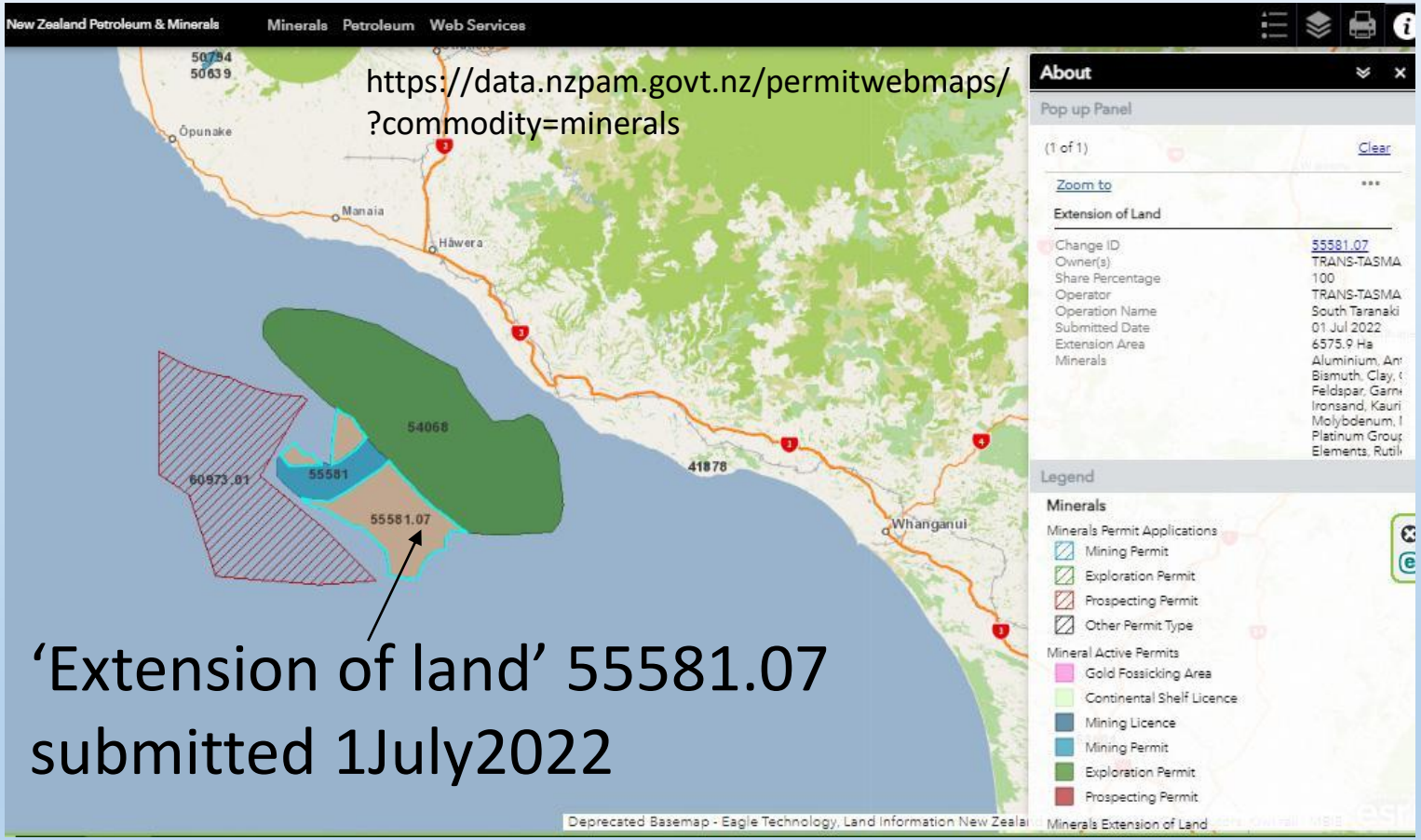
- ‘nationally significant activities’ with approvals from Ministers of Conservation and Energy and Resources

https://www.doc.govt.nz/nature/habitats/marine/other-marine-protection/west-coast-north-island/

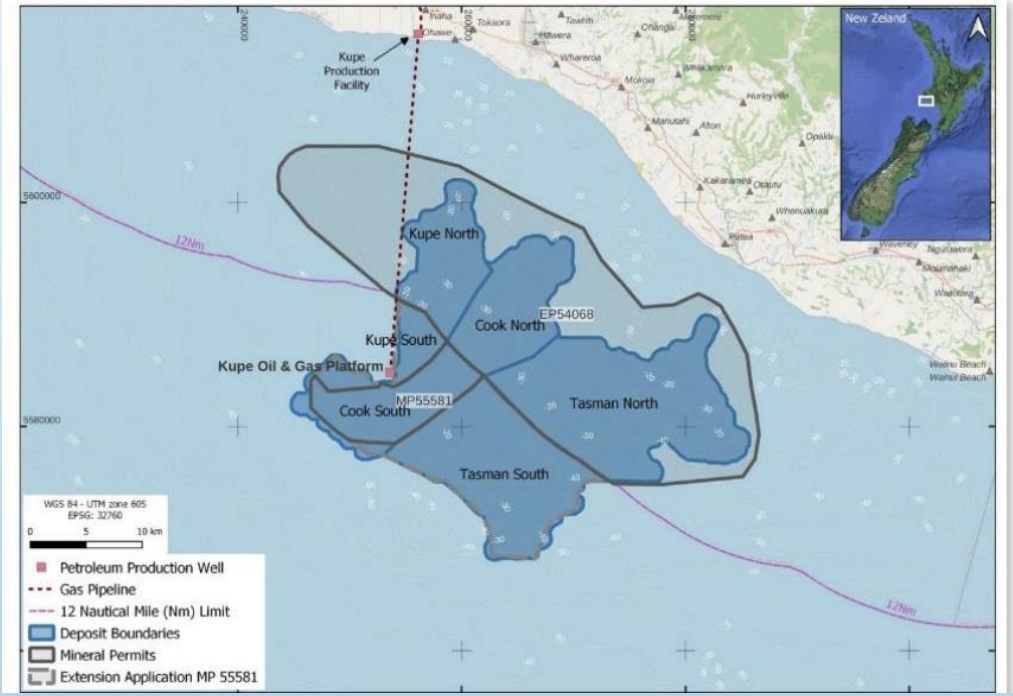
TTRL proposal abuts Sanctuary, with demonstrable trans-boundary effects



Dr. Childerhouse's opinion that Māui dolphin moving inshore would place them in less harm (eg. inside the mammal sanctuary) may be confounded by Exploratory permit 54068 (expired in Dec21 but pending extension) under CMA

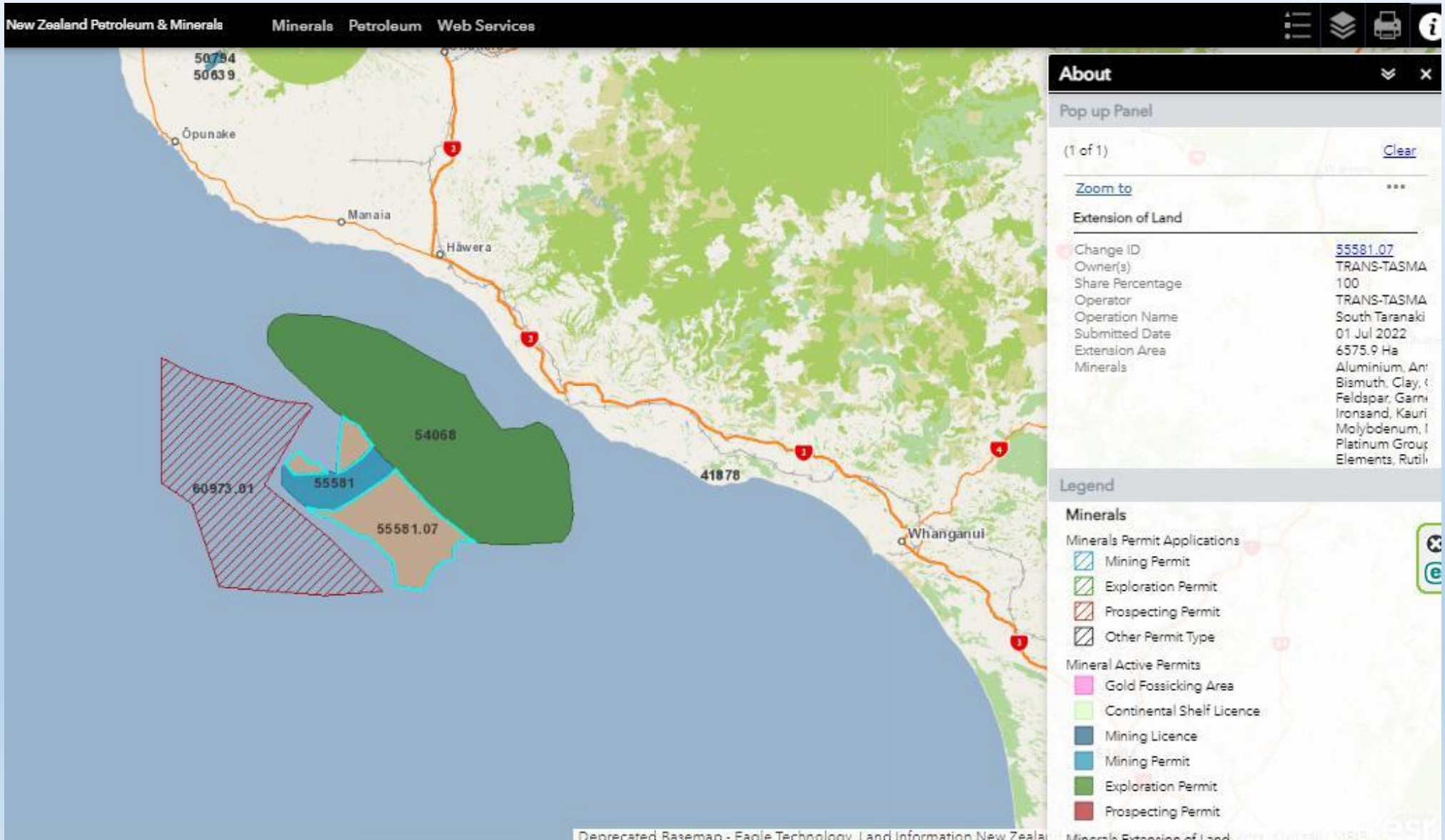


'Extension of land' 55581.07 submitted 1July2022



Manuka Resources (https://www.manukaresources.com.au/site/pdf/494331d8-a335-49d0-8f3d-43565d072a1c/Investor-Presentation.pdf)

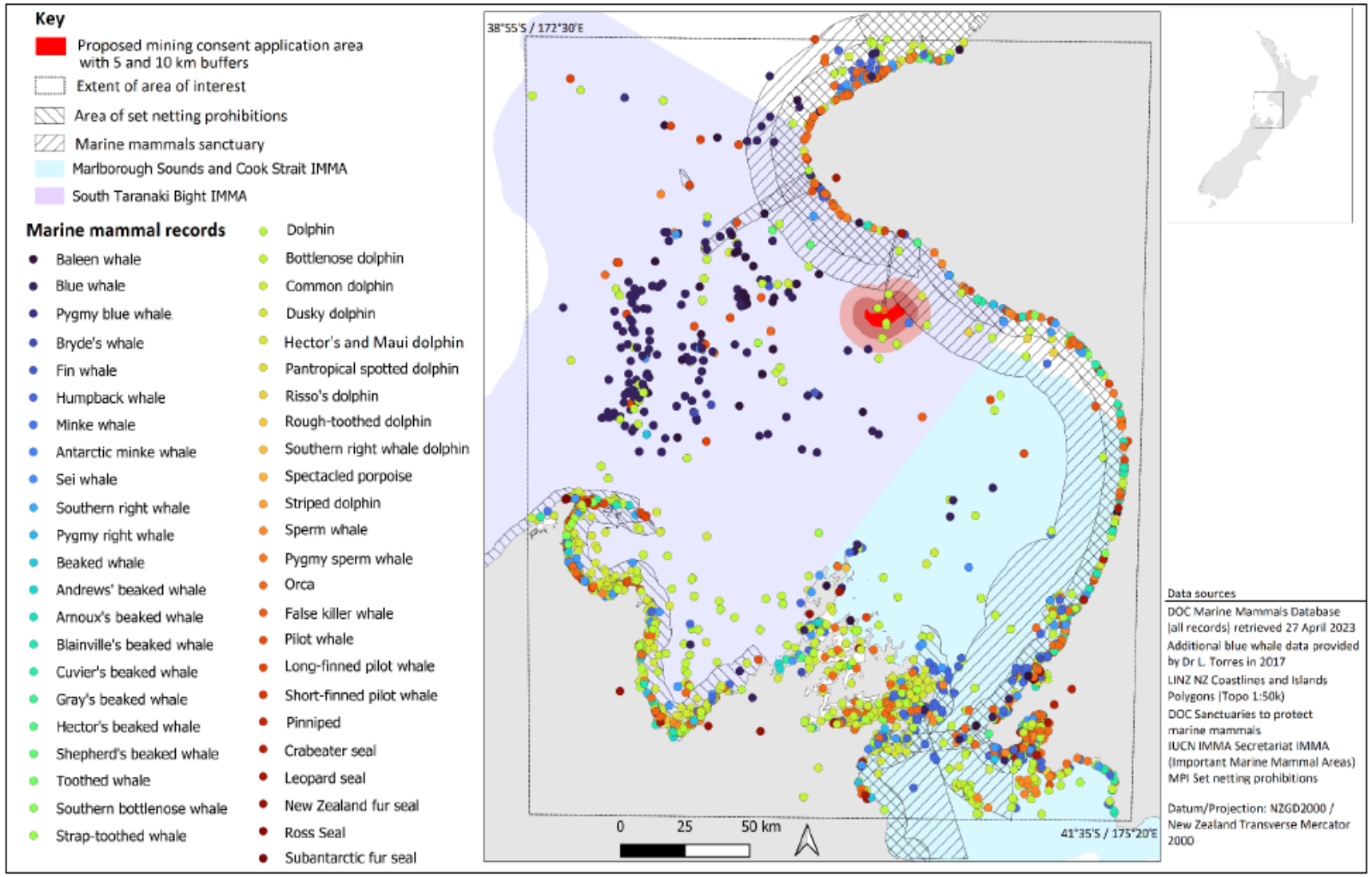
Status of TTRL Exploration Permit & Extension of Land?



CJT sought clarification from MBIE on current status. OIA response: no statutory timeframes for assessing or deciding a permit application, each considered against relevant statutory tests. NZPAM aim for decision 30/6/24.

Figure A2-1. Locations of marine mammal sightings and incidents in the Taranaki region of interest up to November 2016 (all records until 14 November 2016) and since November 2016 (from 15 November 2016 to 27 April 2023). When the species was unknown but the record confirmed what group the animal(s) were, this was counted under the species groupings in italics. Data source: DOC marine mammal sighting and incident database (downloaded on 30 April 2023); Additional blue whale sightings provided by Dr. L. Torres in 2017).

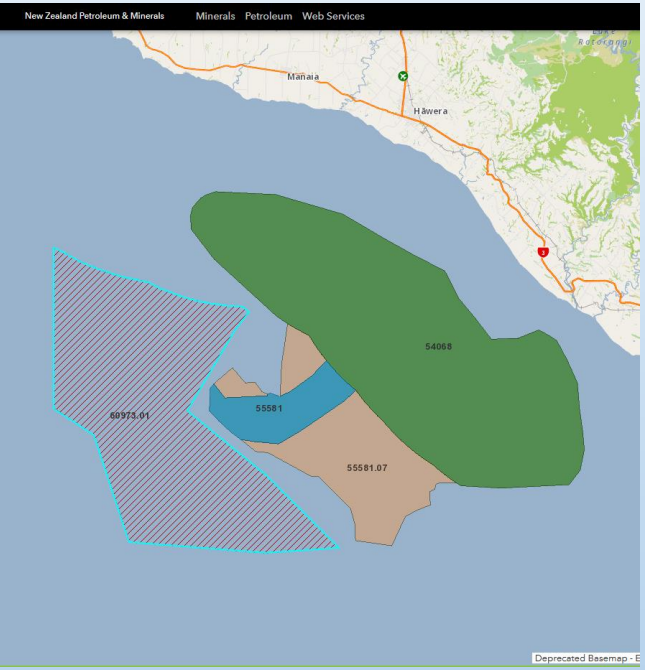
From: Childerhouse Expert evidence 19th May 2023



TTRL's 2022 'Extension of Land' covers more cetacean sightings, with blue whales in proximity, noting annual oceanographic variability re food availability …

South Taranaki Bight a highly sought location

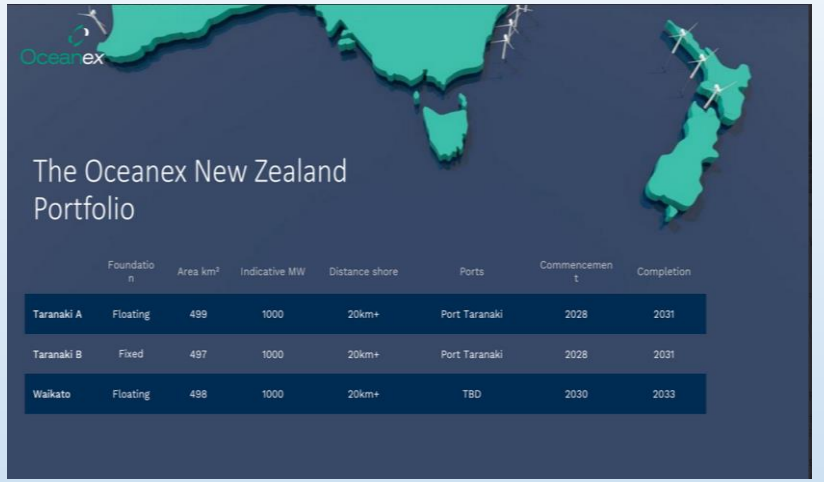
Permit Application - 60973.01



Application Number	60973.01
Submitted Date	12/19/2022, 1:00 PM
Type Code	Minerals Prospecting Permit
Owner(s)	NGARARA EXPLORATION LIMITED
Share Percentage	100
Operator	NGARARA EXPLORATION LIMITED
Location	Taranaki Region
Operation Name	South Taranaki Bight
Status	Under Evaluation since 24 Jan 2023
Area	495 SQKM
Mineral(s)	Zircon, Magnesite, Monazite, Aluminium, Antimony, Bismuth, Chromium, Cobalt, Copper, Gold, Ilmenite, Iron, Ironsand, Lead, Lithium, Magnesium, Magnetite, Manganese, Molybdenum, Nickel, Platinum Group Metals, Rare Earth Elements, Rutile, Silver, Sodium, Strontium, Tantalum, Tin, Titanium, Tungsten, Vanadium, Yttrium, Zinc, Zirconium

Prospecting Permit Ngarara Exploration Limited Under evaluation since 24 Jan 2023.
34+ minerals

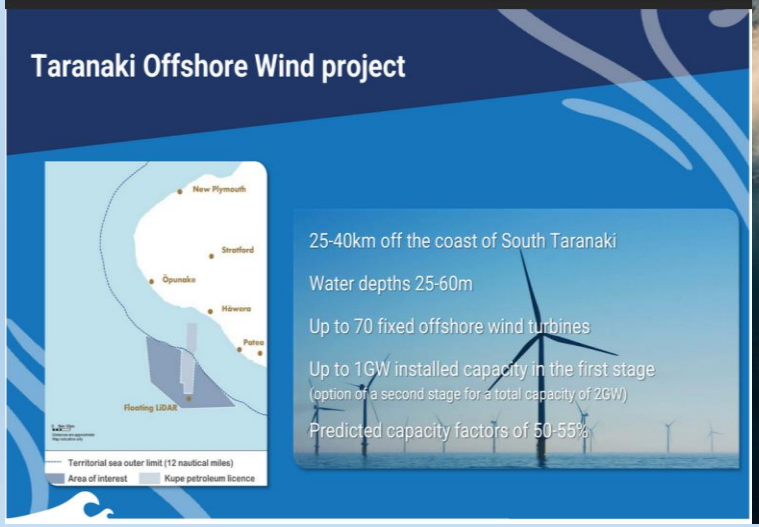
Blue Float Energy & Elemental Group



Wind Quarry Zealandia

NZ Super Fund & Copenhagen Infrastructure Partners

TARANAKI OFFSHORE PARTNERSHIP



Could DMC require a Joint Application?

Cumulative effects definition **S6**

(c) any past, present, or future effect; and (d) any cumulative effect
that arises over time or in combination with other effects;

The Act **S93**:
(1) At any time before or during the processing of an application for a marine consent for a cross-boundary activity [Eg. sediment plume, noise effects], EPA may decide (whether on a request by the applicant or on its own initiative) that the application ought to be processed and heard …with an application for resource consent for the activity...
(3) In the case described in subsection (1), the EPA may decide—
(a) not to continue with the processing or hearing of the application for a marine consent until the application for resource consent is lodged with it and the relevant resource consent authority; or
(b) to return the application for a marine consent to the applicant under section 43 as if it were incomplete.

Cumulative Effects EEZ-CS Act

Assessments for applications could focus on the overall effects, including synergisms, of adding an application to the effects already occurring, and predicted to occur, in coming decades. This is consistent with Sections 6, 28, 33 and 59 of the EEZ-CS Act, which provide broad discretion, and is also consistent with the Precautionary Principle.

Instead, reductionist, ‘siloed’ approaches have typically been adopted.

Cumulative Effects EEZ-CS Act

Section 6 Meaning of effect

(1) … unless the context otherwise requires, *effect* includes—(a) any positive or adverse effect; and (b) any temporary or permanent effect; and (c) any past, present, or future effect; and (d) any cumulative effect that arises over time or in combination with other effects; and (e) any potential effect of high probability; and (f) any potential effect of low probability that has a high potential impact.

(2) Subsection (1)(a) to (d) apply regardless of the scale, intensity, duration, or frequency of the effect.

Cumulative Effects EEZ-CS Act

33 Matters to be considered …

(3) The Minister must take into account—

(a) any effects on the environment or existing interests of allowing an activity with or without a marine consent, including—

(i) cumulative effects; and … the effects of activities that are not regulated under this Act; and …

(d) the importance of protecting the biological diversity and integrity of marine species, ecosystems, and processes;

(e) the importance of protecting rare and vulnerable ecosystems and the habitats of threatened species; and

(f) New Zealand's international obligations;

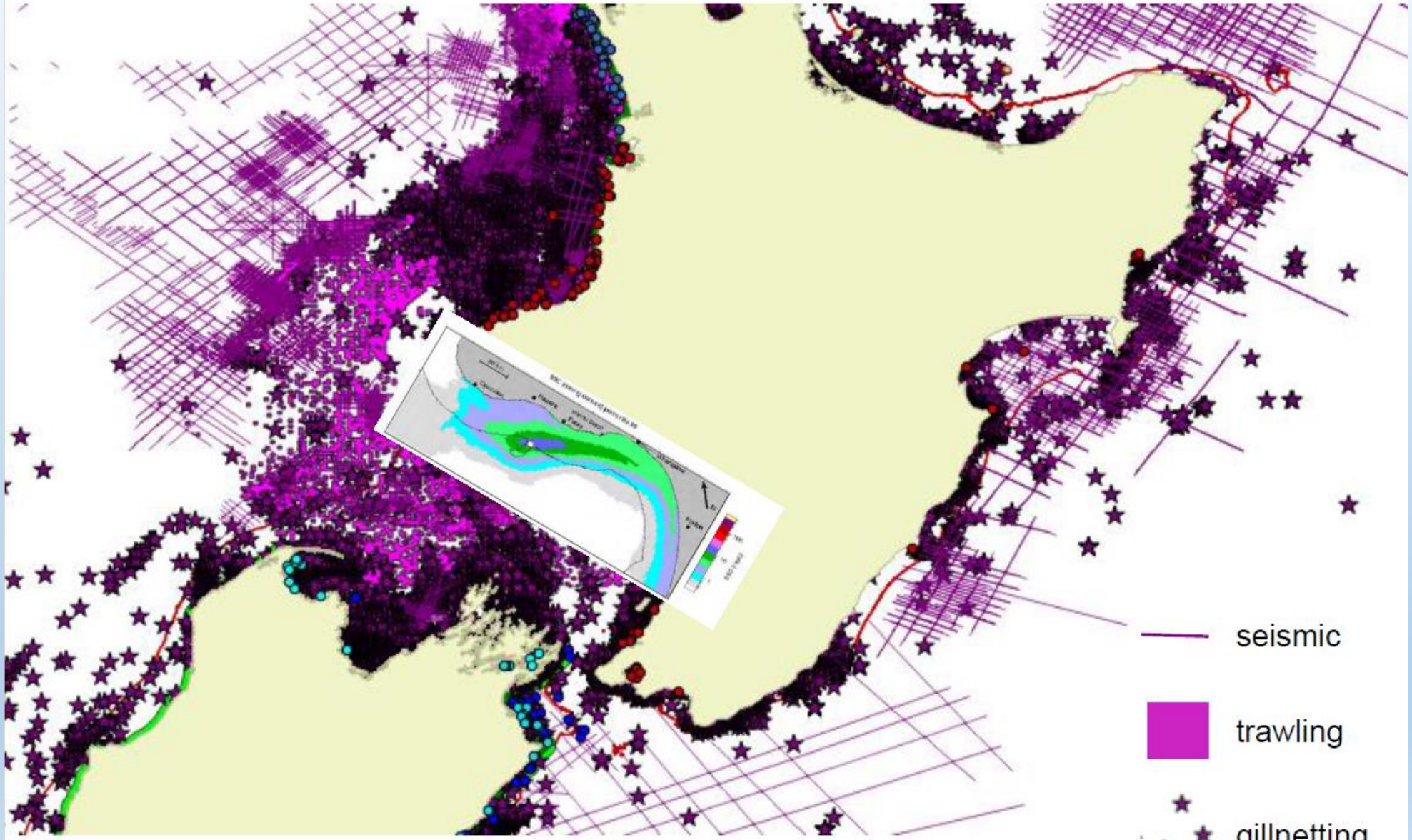
International obligations

Article 8 of the UN Convention on Biological Diversity requires the following of Parties, including New Zealand (which signed and ratified the Convention in 1992 and 1993):

Article 8(d) Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;

Article 8(f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species,…

Existing uses offshore Taranaki



Slide prepared by Prof. Liz Slooten (U. Otago)

Cumulative effects: Oceanography

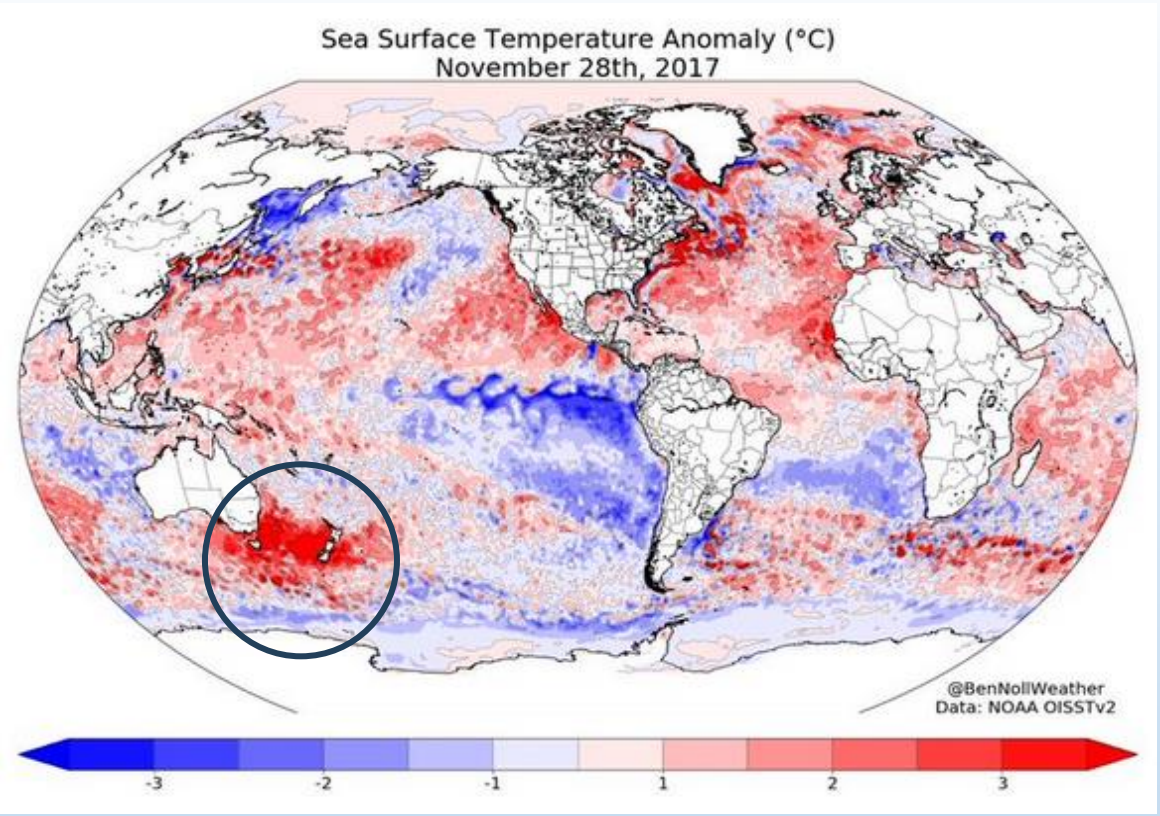
The ocean

- has warmed unabated since 2005, continuing the clear multi-decadal ocean warming trends documented in IPCC AR5; & with increasing storm strength
- is continuing to acidify in response to ongoing ocean carbon uptake
- is losing oxygen overall with a very likely loss of 0.5–3.3% between 1970–2010 from the ocean surface to 1000 m (medium confidence)
- nutrient cycles are perturbed and there is high confidence that this is having a regionally variable impact on primary producers
- warming has contributed to observed changes in biogeography of organisms ranging from phytoplankton * to marine mammals (high confidence) …

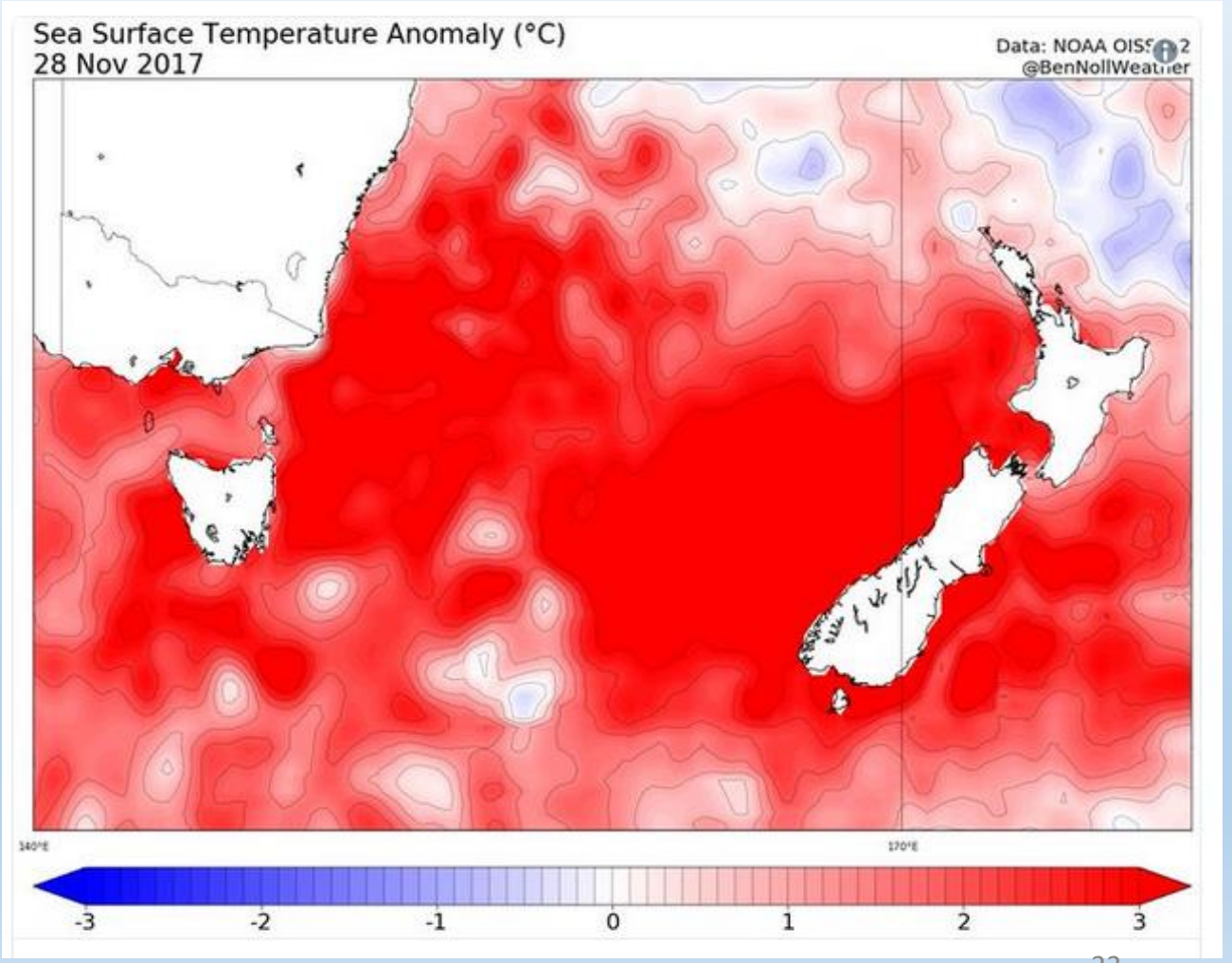
https://www.ipcc.ch/site/assets/uploads/sites/3/2022/03/07_SROCC_Ch05_FINAL.pdf

* E.g. see Brown et al. (2024) https://doi.org/10.1038/s42003-023-05702-4

Aotearoa's seas are no exception, indeed world 'leaders'

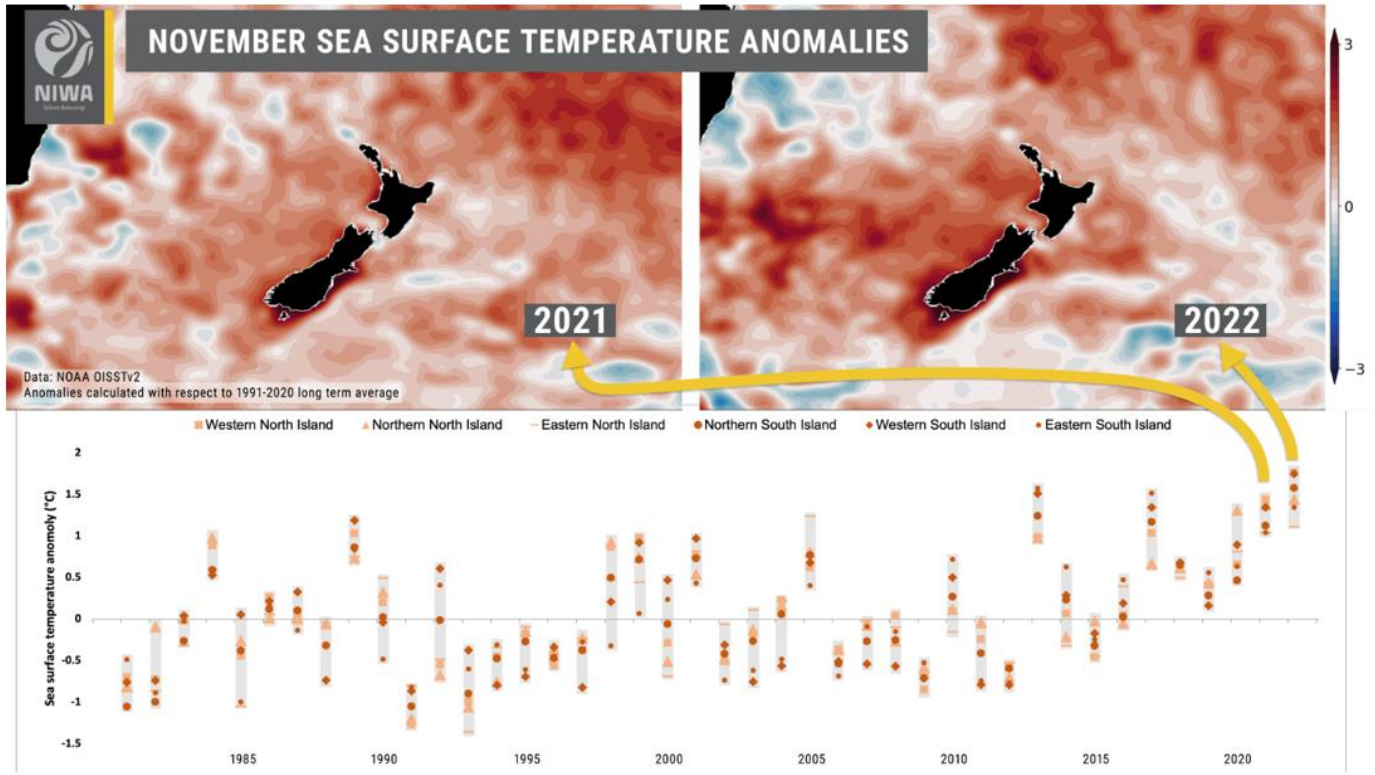


NZ EEZ temperature ‘snapshot’ 28th Nov. 2017

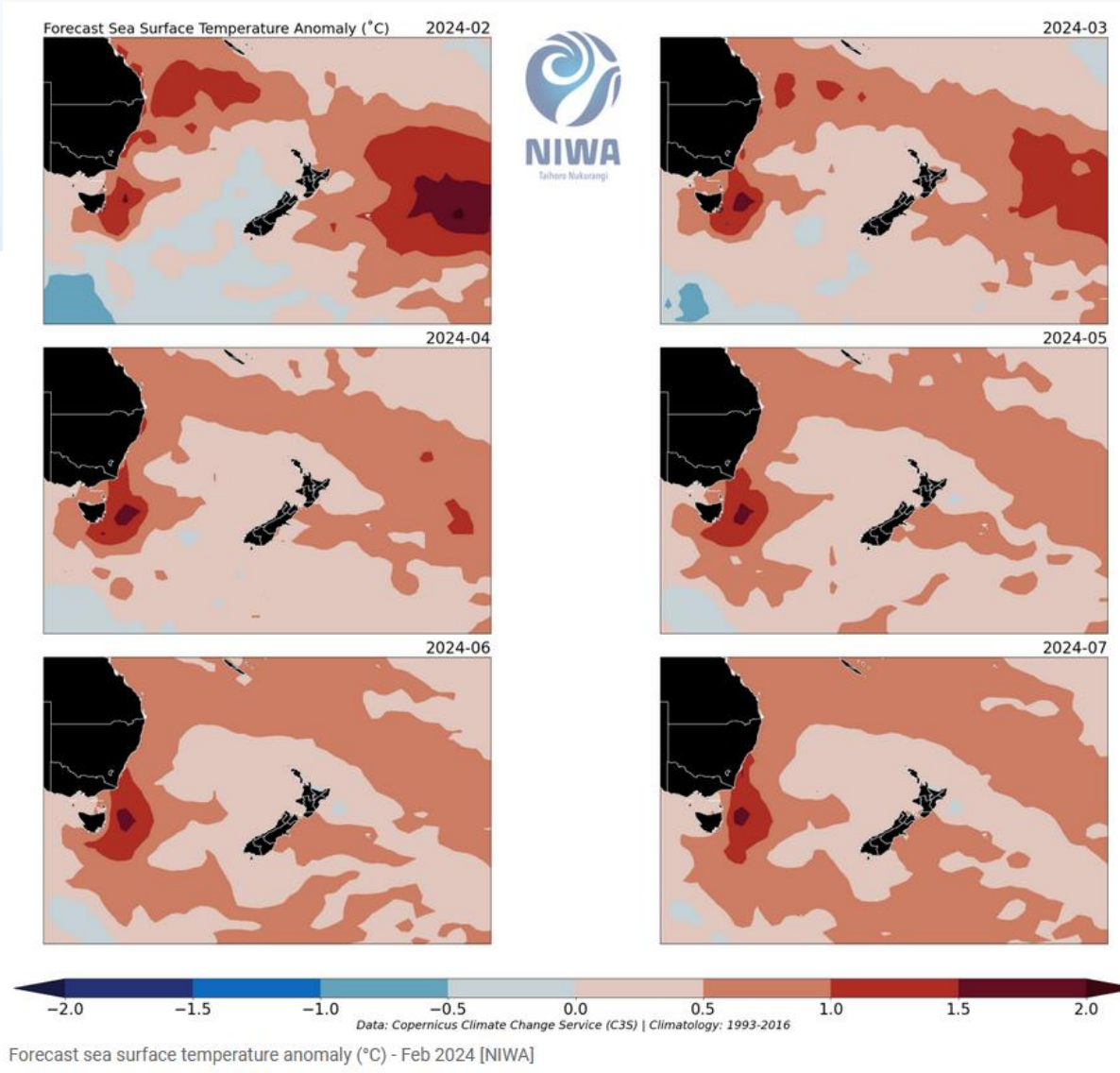


Record-breaking sea temps have cascading effects on food webs (eg. ‘drastic reduction in krill biomass’). Johnson et al. (2011) Climate change cascades: Shifts in oceanography, species' ranges and subtidal marine community dynamics in eastern Tasmania. JEMBE doi:10.1016/j.jembe.2011.02.032

Continued heating of Tasman Sea with extended ‘unprecedented’ marine heatwaves since 2015



The average temperature of the ocean is now 1.5°C higher than it was 100 years ago, and in the past 30 years, the frequency of marine heatwave events has doubled.



Forecast sea surface temperature anomaly (°C) - Feb 2024 [NIWA]

Right panel: Month-average temperature anomaly predictions cf. historical observations (1993-2016). Positive differences imply the month average temperatures exceed the corresponding historical average. Note that the historical average is recent, not pre-industrial.

Acidification continues to 2050 (at least) under 4 IPCC scenarios, with other stressors

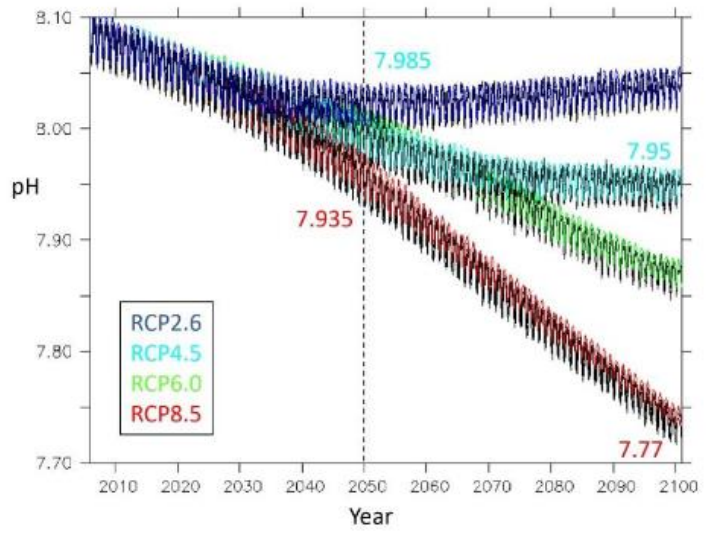


Figure 1-3 Projected surface pH for the NZ region under each Representative Concentration Pathway (RCP), with the Mid- and End-Century mean pH identified for RCP4.5 and 8.5. For each RCP, the black line indicates the mean of projections from six Earth System Models (ESMs) and the coloured line (Blue - RCP2.6, Cyan - RCP4.5, Green – RCP6.0, Red-RCP8.5) the projection generated using the GFDL-ESMG2 Earth System Model (reproduced from Law et al. 2018b).

Coastal and oceanic environments subject to many anthropogenic and natural stressors…. Ocean warming, coastal pollution, de-oxygenation, changing nutrient and light levels … affect marine plants and … animals at the individual, species and ecosystem levels. … overall combined stress is what is ecologically important. Currie (2022) Ocean Acidification Assessment. NIWA. *Prepared for Ministry for the Environment and Stats NZ.*

Sir Peter Gluckman (2013): "For New Zealand, the resulting impact of changes in wind patterns, precipitation, and the chemistry of our oceans can be expected to be at least as significant as the changes in temperature itself."

Synergisms among Sea temp., OA and Noise

"Ocean acidification will decrease sound absorption at low frequencies (<10 kHz), enhancing long-range sound propagation. At the same time, temperature changes can modify the sound speed profile, leading to the creation or disappearance of sound ducts in which sound can propagate over large distances."

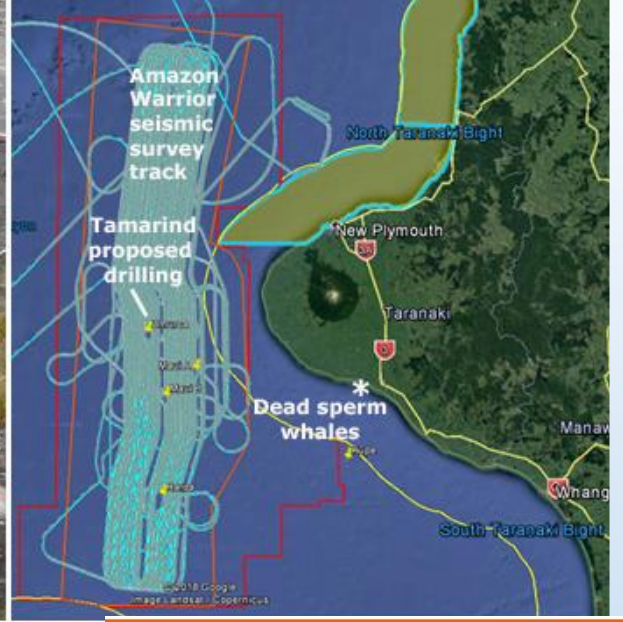
Possenti et al. (2023) Predicting the contribution of climate change on North Atlantic underwater sound propagation. PeerJ 11:e16208 https://doi.org/10.7717/peerj.16208

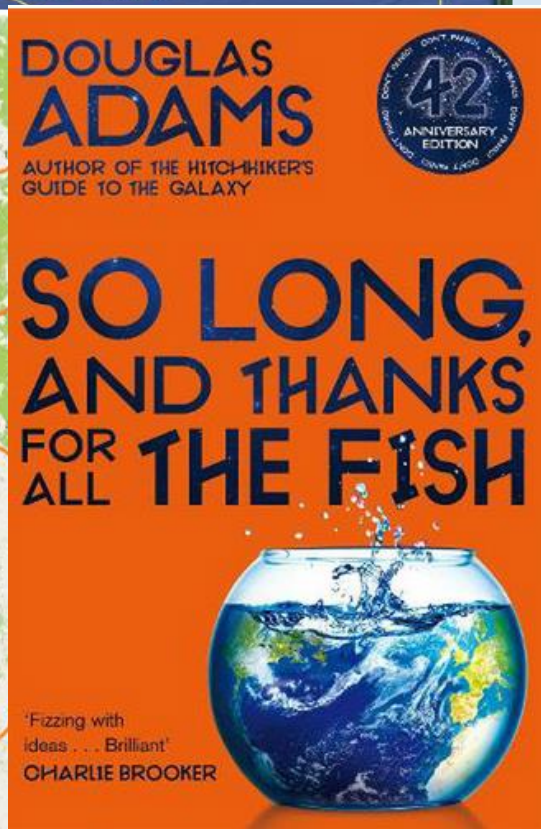
"… without information on the intensity and frequency range of the noise from … mining … it is not possible to determine the likely impacts on marine mammals, including physical and behavioral effects" & "… fish species both vocalize and are sensitive to underwater noise" (Excerpts from Expert caucusing Feb 2024).

Cetacean mortalities

12 dead Sperm whales washed ashore on South Taranaki beach, May 2018, after major seismic blasting survey.

- Not a stranding – all died offshore, likely all at once
- Cause of death unattributed
- MM Observer failure?





https://www.newshub.co.nz/home/new-zealand/2018/05/eight-dead-sperm-whales-found-on-taranaki-beach.html
https://www.stuff.co.nz/national/104249829/unprecedented-whale-strandings-reaches-11-in-total-on-taranaki-beach
https://climatejusticetaranaki.wordpress.com/2018/05/28/media-release-climate-justice-taranaki-questions-the-cause-of-sperm/
https://www.rnz.co.nz/national/programmes/morningreport/audio/2018646782/why-did-a-dozen-sperm-whales-wash-up-in-south-taranaki

Cumulative Effects: Fisheries

- Fisheries catches and composition in many regions are already impacted by the effects of warming and changing primary production on growth, reproduction and survival of fish stocks (high confidence)
- Warming-induced changes in spatial distribution and abundance have already challenged the management of some important fisheries and their economic benefits (high confidence)
- Coastal ecosystems under stress from ocean warming and SLR exacerbated by non-climatic pressures from human activities (high confidence)
- Since early 1980s, the occurrence of harmful algal blooms and pathogenic organisms has increased in coastal areas in response to warming, deoxygenation and eutrophication, with negative impacts on food provisioning, tourism, the economy and human health (high confidence).

https://www.ipcc.ch/site/assets/uploads/sites/3/2022/03/07_SROCC_Ch05_FINAL.pdf

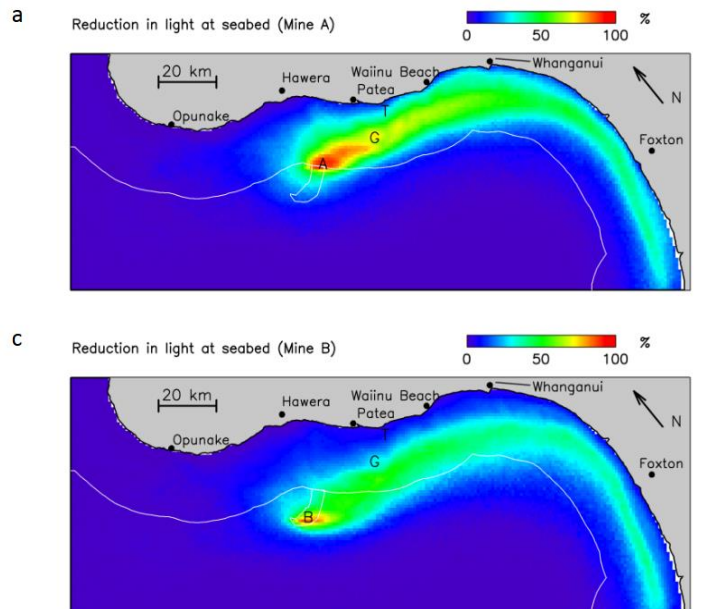
Cumulative Effects: Seabirds

Dr. David Thompson: “Risks include displacement from the mining site (physical exclusion), reduced foraging efficiency (via increased turbidity from the sediment plume), noise, fuel or oil pollution and through effects of artificial nocturnal lighting.”

Professor John Cockrem: “… seabird populations are going to be … more vulnerable to adverse effects created by dirty water from seabed mining. Their … existence is becoming gradually … harder. This is owing to changes in food availability that can come from changes in sea surface temperatures, leading to changes in the extent to which nutrient-carrying colder water is upwelling to the surface. Seabirds are facing a much more precarious existence in coming decades, than was the case before.” https://pacific.scoop.co.nz/2023/05/seabed-mining-around-aotearoa-expert-qa/

Cumulative effects: benthos

Many marine species have narrow physiological tolerance limits set to local environs. Most require specific metamorphosis cues and, for sessile and site-attached species, settlement cues.



Pinkerton (2017) Optical effects …

Changes in local conditions can alter or destroy such cues, create trophic cascades through food webs. In STB, some species may already be living close to those limits. Morrison et al. (2022): < 5% of STB seafloor estimated to receive sufficient light to support microalgae growth (citing Pinkerton 2014). Increasing turbidity from spoil dumping effects. NOTE: D. Greer's evidence 2017, 2024: plume model 7 sec wave period - underestimate affects plume size and dynamics. Also, natural resuspension is of surface sediments, not those from 5-8m deep with potentially different chemistry.

Taranaki South-west swell 2.8m @ 13 secs October 2018

South Taranaki Bight Wind DoC concerns March 2023

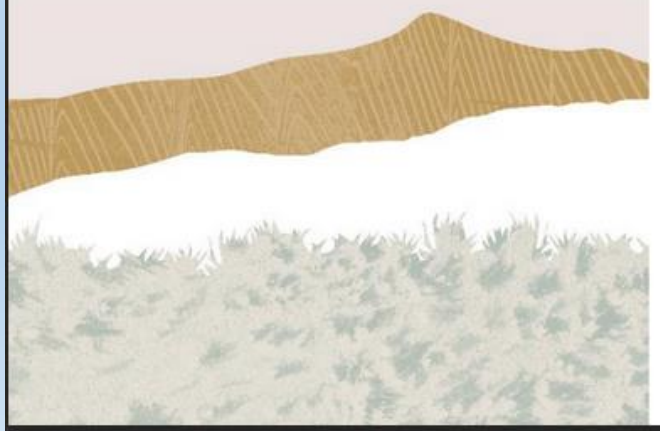
Offshore Renewable Energy Forum

Environmental Considerations

9 March 2023

Department of Conservation
Te Papa Atawbai

Current knowledge of offshore environment



- Contains highly threatened species and migratory corridors.
- There is a lack of current data on species and habitats; data deficient and data poor.
- Time needed to gather knowledge and baseline data.
- Limited ability to mitigate or offset.

HIGH WIND

JELLYFISH;
DANGEROUS JELLYFISH

Confidence in Best Available Information (BAI), ‘Conditions’, monitoring and regulatory options

If BAI does not accurately represent the present or future (models or muddles?), can ‘conditions’ be fit for purpose or even met? Enforcement or self-regulation?

Monitoring: can ‘best practice’ provide sufficient statistical power to detect operational effects vs background ‘natural’ variability, other effects, future effects, synergisms?

Remediation: What happens when material harm occurs and/or ‘recovery’ does not? Is remediation possible?

Bond / insurance: What price for species loss?

Best laid plans of mice and men …

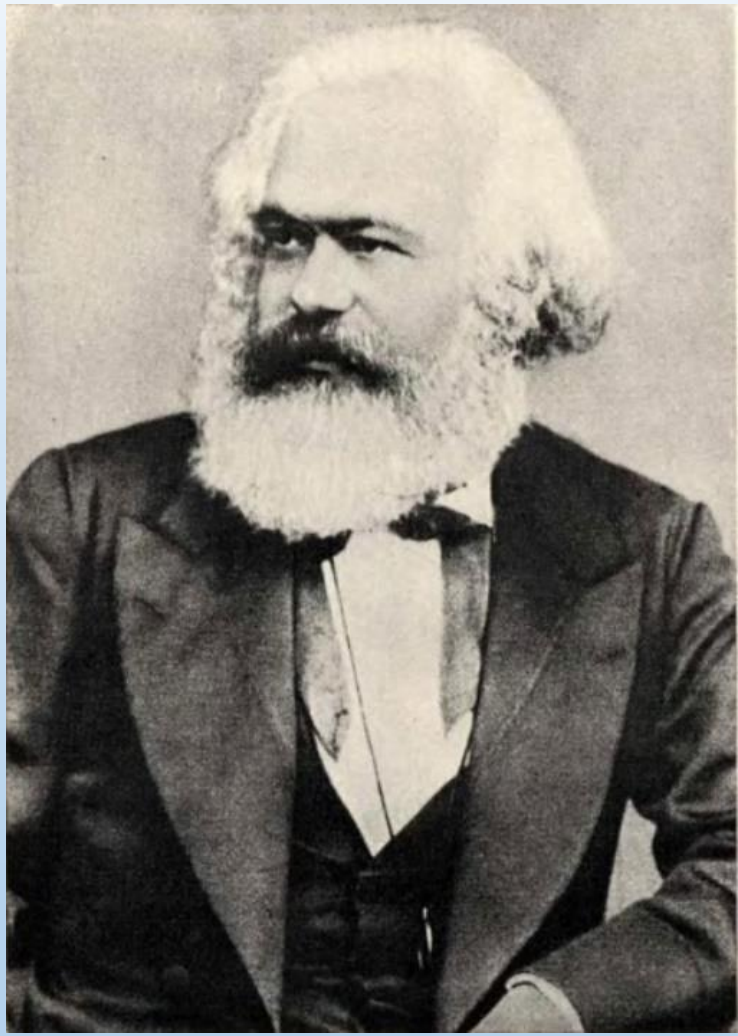
Biological-ecological Risks: Knowledge gaps and 'best available information'

"… patterns of species discovery … ask whether we will find species before they go extinct or only afterwards. The simple message is that we are constantly adding to the totals of recently extinct species. ... Less expected is that we are adding new species that, when discovered, are so threatened that they survive for only a few years. That we have these examples may be by good luck: we will surely have missed many others. This renders global estimates of extinction rates conservative. The survival of these global rarities is dependent on the protection of remaining [habitat]"

Lees AC, Pimm SL (2015) Species, extinct before we know them? Current Biology 25: R177-180. https://doi.org/10.1016/j.cub.2014.12.017

Concluding Remarks

Karl Marx (1861) could have been writing about the present proposal: Not “For the first time, nature becomes purely an object for humankind, purely a matter of utility; ceases to be recognized as a power for itself; and the theoretical discovery of its autonomous laws appears merely as a ruse to subjugate it under human needs, whether as an object of consumption or as a means of production.”



Karl Marx (1818-1883). Photo from Wikimedia Commons

Concluding Remarks

Tuhi-Ao Bailey: “The affected iwi, hapū and whanau of Taranaki, including members of CJT, have … consistently said that no, we don’t want it. Since 2011, Ngāti Ruanui and Taranaki iwi have led the fight against the practice. … As we sit in the midst of … mass extinction and face the collapse of our global climatic systems, we cannot possibly support an industry that would severely damage the seabed in our rohe and cause multiple as yet unknown effects on sealife and the communities’ ability to feed itself from our fisheries.”