Tamarind Hearing presentation

Applications for marine consent and marine discharge consent under the EEZ-CS Act (2012)

Before the EPA Board of Inquiry, 8th November 2018

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Opposed.

Cumulative Effects

Assessments for notified applications consented under the EEZ-CS Act have focused on the application at hand, not on the overall impact, including synergisms, of adding that application to those already occurring, and predicted to occur in coming decades.

This is inconsistent with Sections 6, 28, 33 and 59 of the EEZ-CS Act.

EEZ-CS Act ‘cumulative effects’

6 Meaning of effect

(1) In this Act, 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.

EEZ-CS Act ‘cumulative effects’

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 …
(i) the **effects of activities that are not regulated under this Act**; and
(ii) …
(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**; and
(i) the nature and effect of other marine management regimes; …

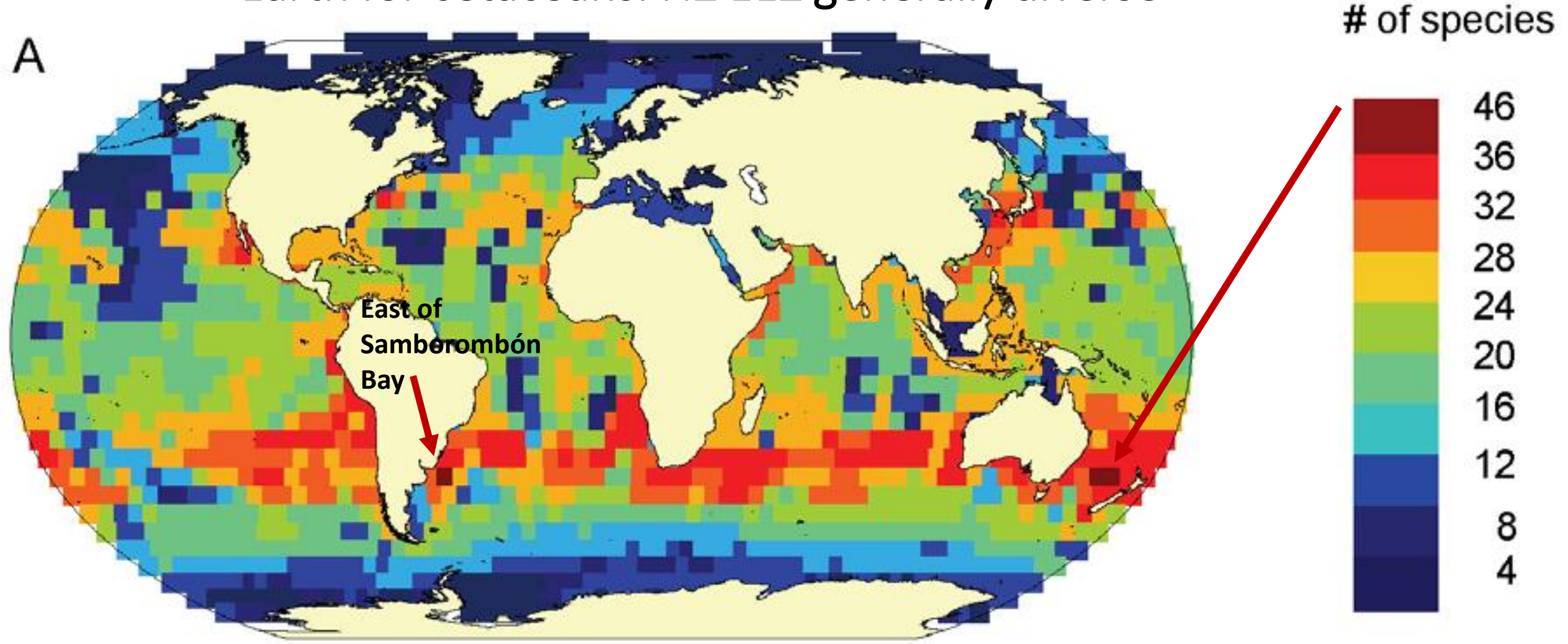
UN Convention on Biological Diversity

Article 8 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**,…

Why is this relevant?

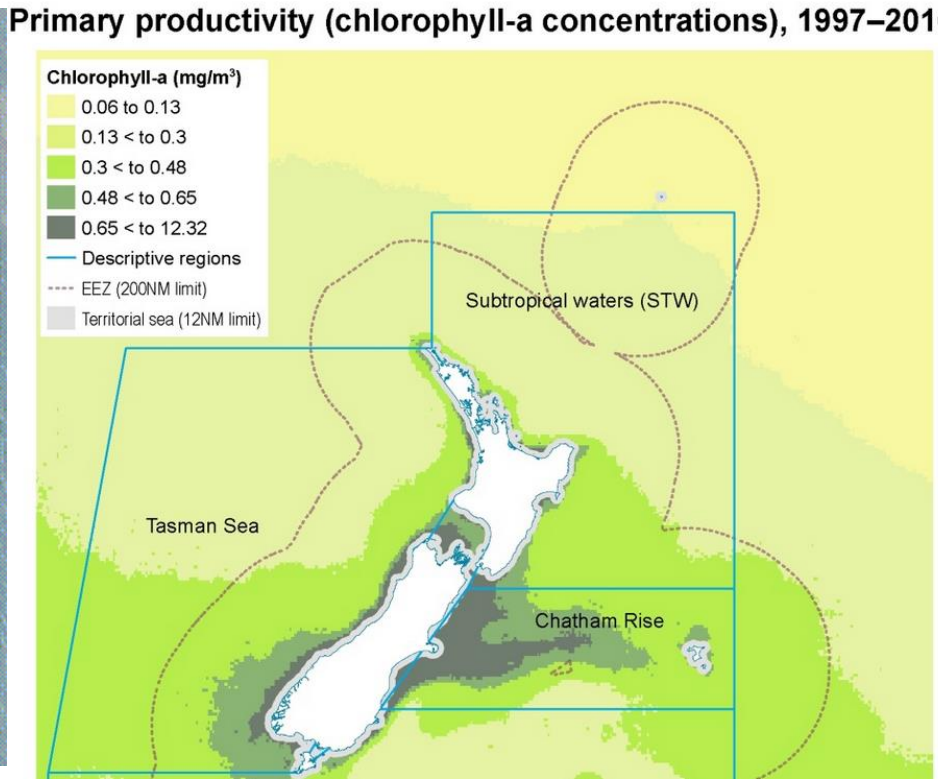
Eastern Tasman Sea – Taranaki Bight: 1 of the 2 richest places on Earth for cetaceans. NZ EEZ generally diverse



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

Why is STB globally significant for cetaceans?

Courtesy Todd Chandler and Dr. Leigh Torres



http://archive.stats.govt.nz/browse_for_stats/environment/environmental-reporting-series/environmental-indicators/Home/Marine/primary-productivity.aspx

High productivity, evidenced by krill *Nyctiphanes australis*. Krill populations, and those of their predators, shift seasonally, related to upwelling off Farewell Spit, sea temperature and presence of phytoplankton (Foster & Battaerd 1985, Bradford & Chapman 1988, James & Wilkinson 1988 among others).

Species from South Taranaki Bight on IUCN Red List

Species	IUCN Red List / NZ (if different)	Species	IUCN Red List / NZ (if different)
Antarctic Minke Whale	DD (NT)	Risso's Dolphin	LC
Common Minke Whale	LC	Short-finned Pilot Whale	DD
Southern Right Whale	LC **(NV) ***	Long-finned Pilot Whale	DD (NT)
Bryde's Whale	DD **(NC) ***	Spectacled Porpoise	DD
Sei Whale	**En**	False Killer Whale	DD (NT)
Humpback Whale	LC	Killer Whale	**DD (NC) ***
Fin Whale	**En**	Pygmy Sperm Whale	DD (NT)
Blue Whale	**En**	Southern Bottlenose Whale	**LC (DD)**
Pygmy Blue Whale (subspecies)	**En**	Hector's Beaked Whale	DD
Hector's Dolphin	**En (NE) ****	Shepherd's Beaked Whale	DD
Maui's Dolphin (subspecies)	**En (NC) ***	Cuvier's Beaked Whale	**LC (DD)**
Dusky Dolphin	DD	Ginkgo Toothed Beaked Whale	DD
Pan Tropical spotted Dolphin	LC	Gray's Beaked Whale	DD (NT)
Indo-Pacific Bottlenose Dolphin	DD	Arnoux's Beaked Whale	DD
Common Bottlenose Dolphin	**LC (NE) ****	Andrew's Beaked Whale	DD
Striped Dolphin	LC	Strap-toothed Whale	DD
Southern Right Whale Dolphin	**DD (NT)**	**Sperm Whale**	**Vu (NT)**

DD: Data Deficient; LC: Least Concern; Vu: Vulnerable; En: Endangered.

- **6 spp. Endangered**
- **1 sp. Vulnerable**
- **18 spp. Data Deficient**

*** 3 spp. Nationally Critical (NC)**

**** 2 spp. Nat. Endangered (NE)**

***** 1 sp. Nat. Vulnerable (NV)**

NT – Not Threatened

Unexplained deaths of threatened species in STB

In May-June 2018, 13 sperm whales died at sea. The deaths followed

- record heating of Tasman Sea
- failure of upwelling with related probable impacts on the food web
- months of seismic blasting from the Amazon Warrior
- and other industrial activities.

Sperm whales, and other toothed whales, use echolocation in hunting, effectively ‘seeing with sound’.

It is likely the whales were under significant physiological stress from multiple impacts, contributing to or causing their deaths.

Cumulative effects

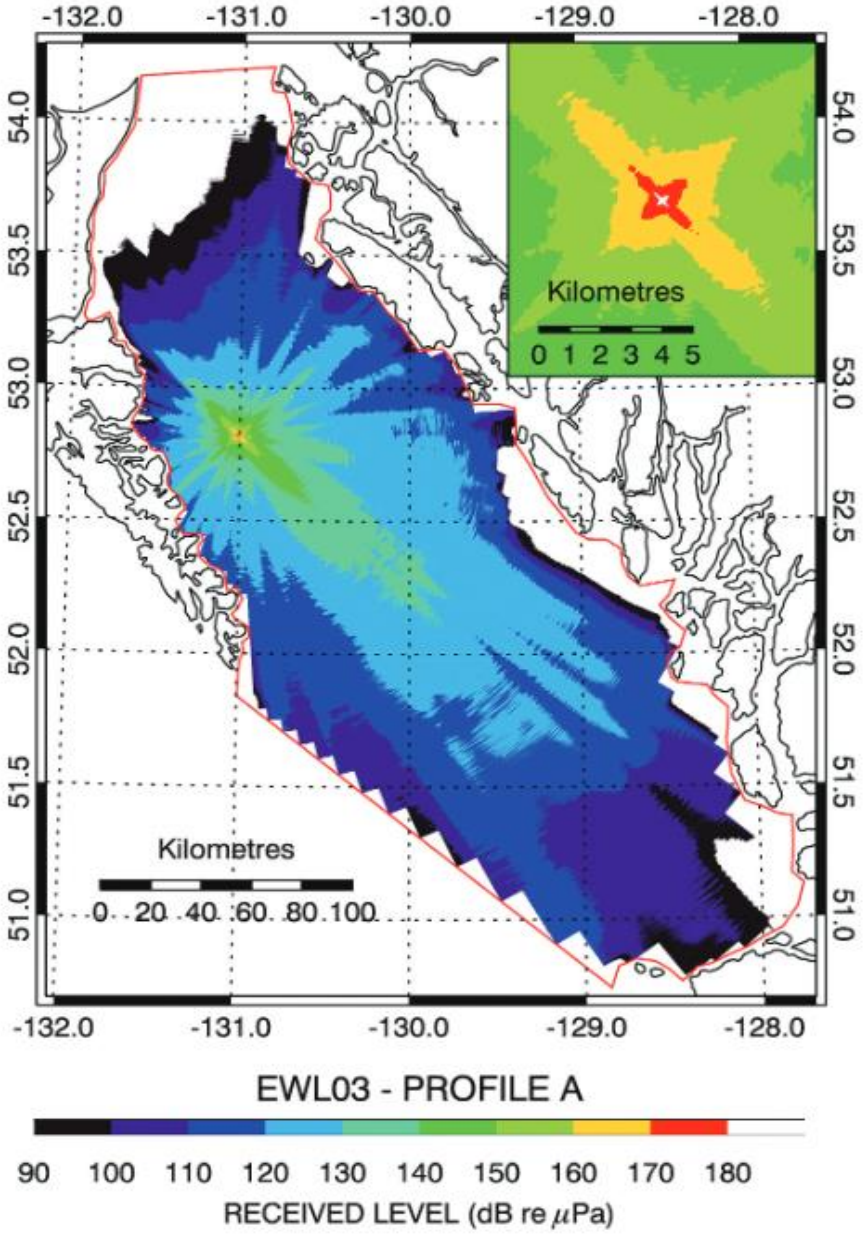
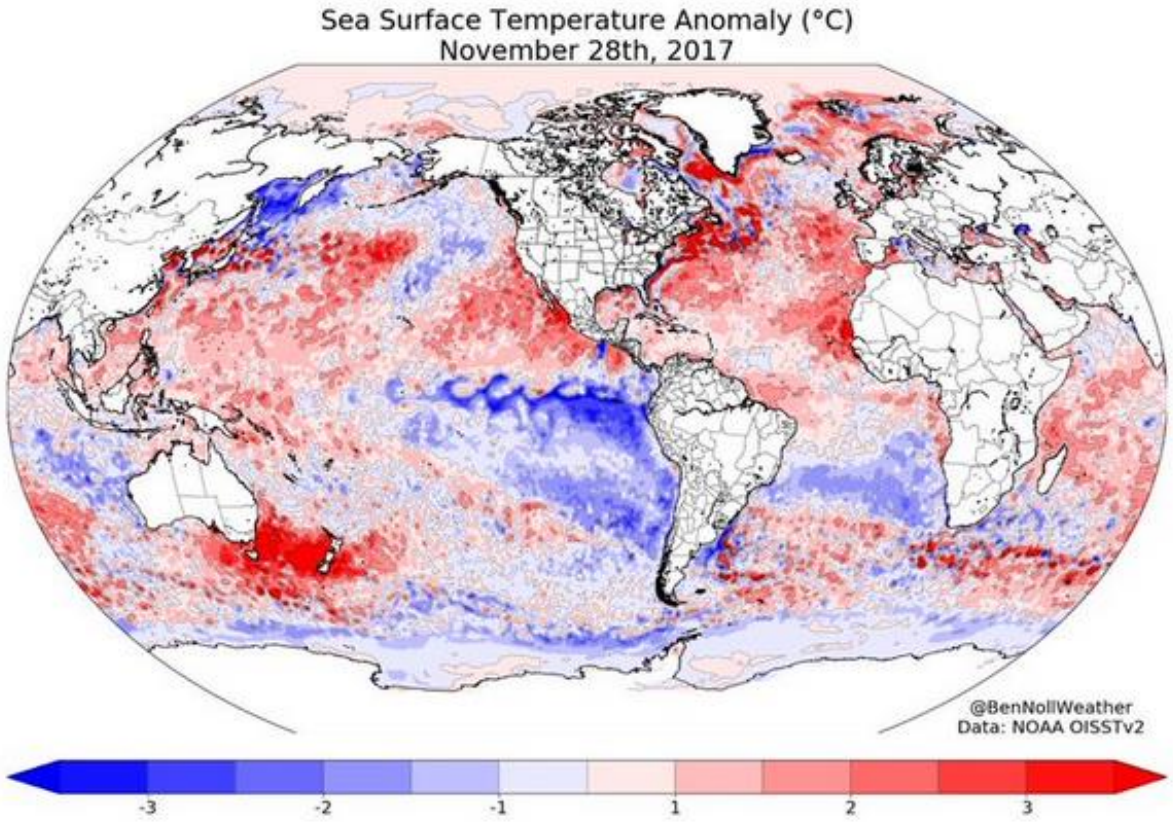
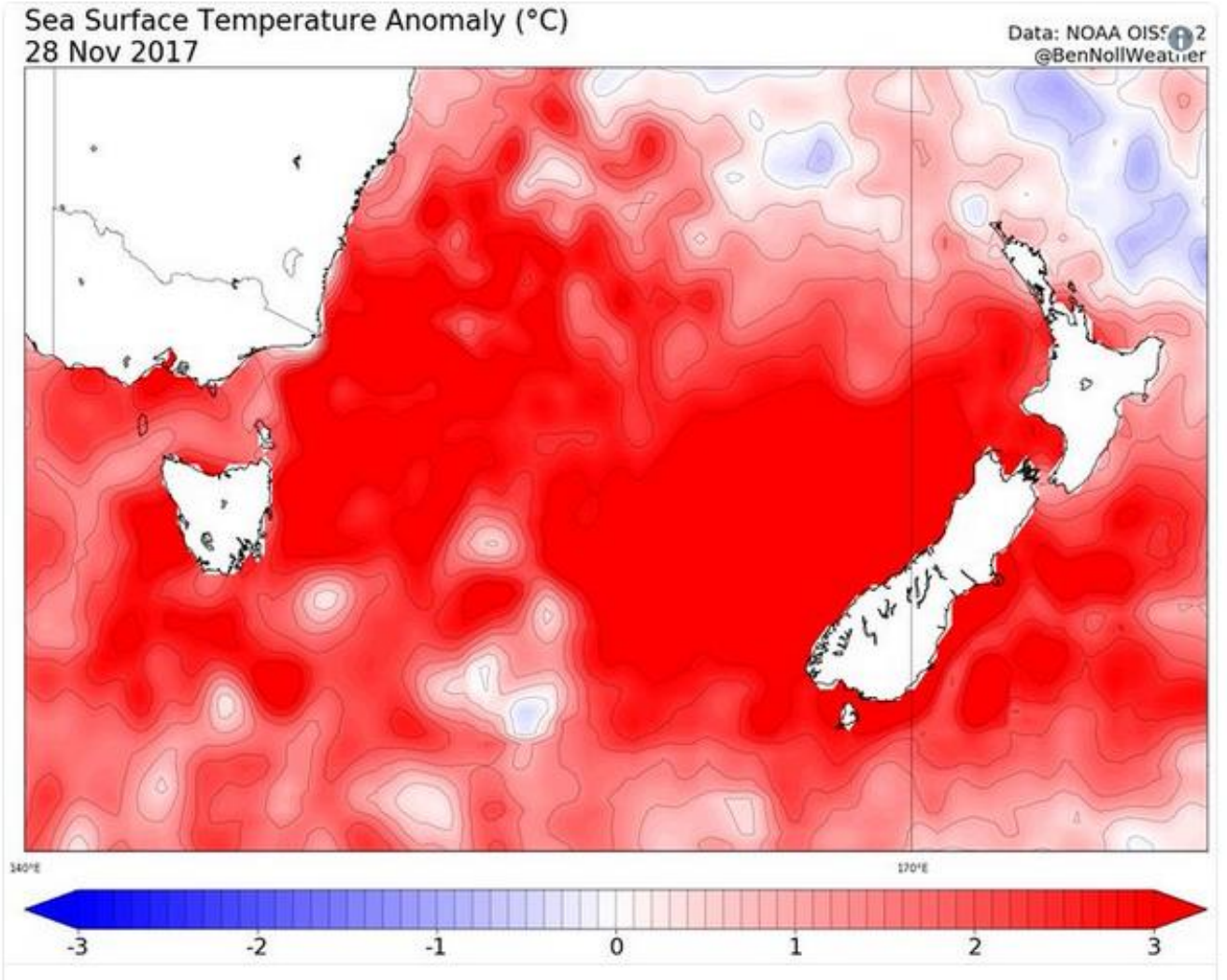


Photo: The Amazon Warrior's path of destruction, from Google Earth KMZ

Gisiner (2016) http://acousticstoday.org/wp-content/uploads/2016/12/Seismic-Surveys.pdf



Tasman Sea temperature ‘snapshot’ 28th Nov. 2017



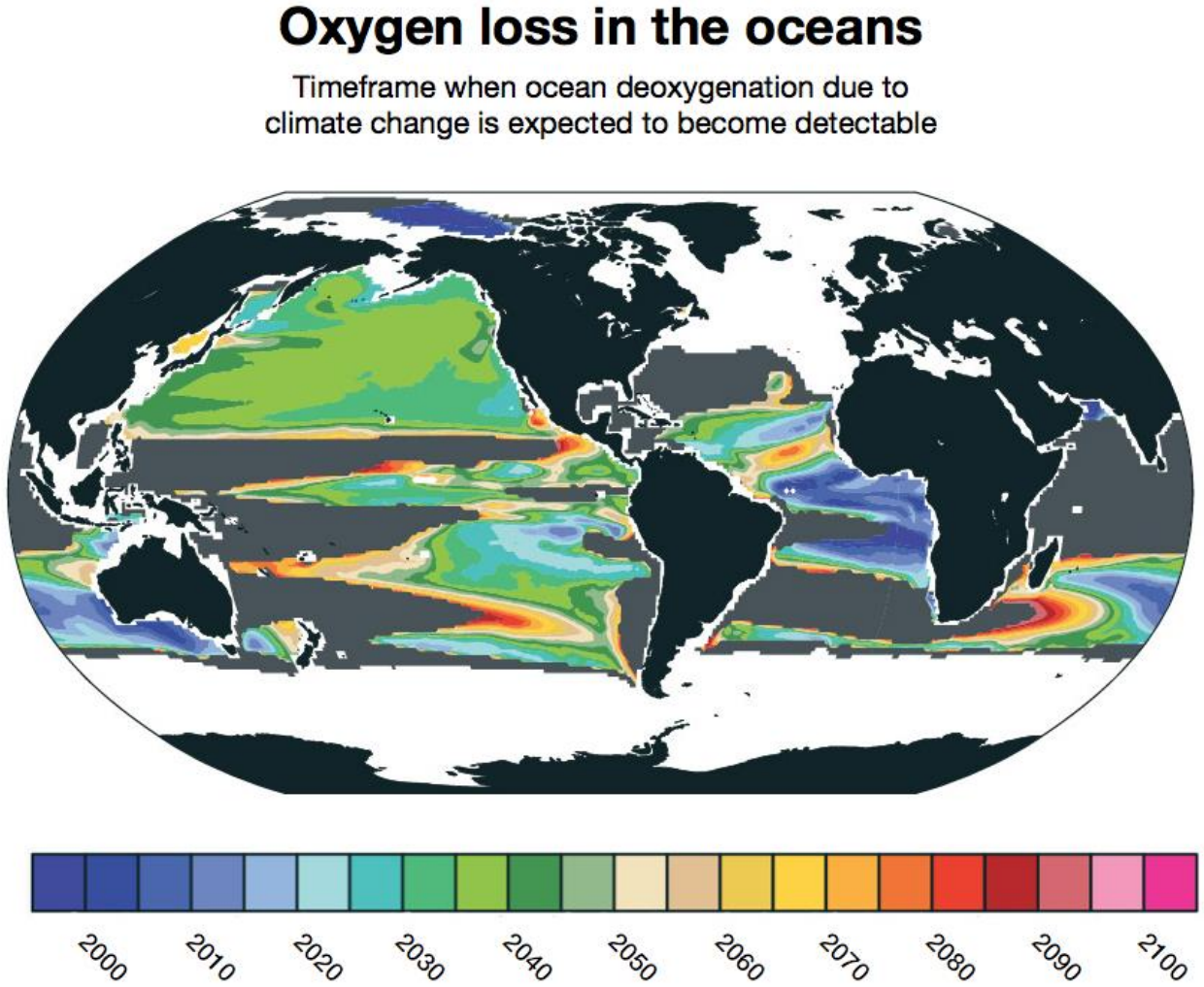
Record-breaking sea temps have cascading effects on food webs (eg. ‘drastic reduction in krill biomass’, Johnson et al. 2011)

The Future: A ‘Perfect Storm’ of cumulative effects

The physical, chemical and biological oceanography of the Tasman Sea are changing, not just from local industrialization, but also from climate disruption. Rising sea temperature, storms, ocean acidification, deoxygenation and associated impacts on productivity and food webs will all increase in coming decades.

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.”*

‘Cumulative effects’ under Sections 6, 28, 33 and 59 of EEZ Act



Western Tasman Sea already showing Oxygen loss – indirect 'cumulative effect' on cetaceans via trophic cascades.

High-precision O_2 measurements dating to 1991 suggest that ocean warming is at the high end of previous estimates.

Deoxygenation is already detectable - will likely become widespread by 2040.

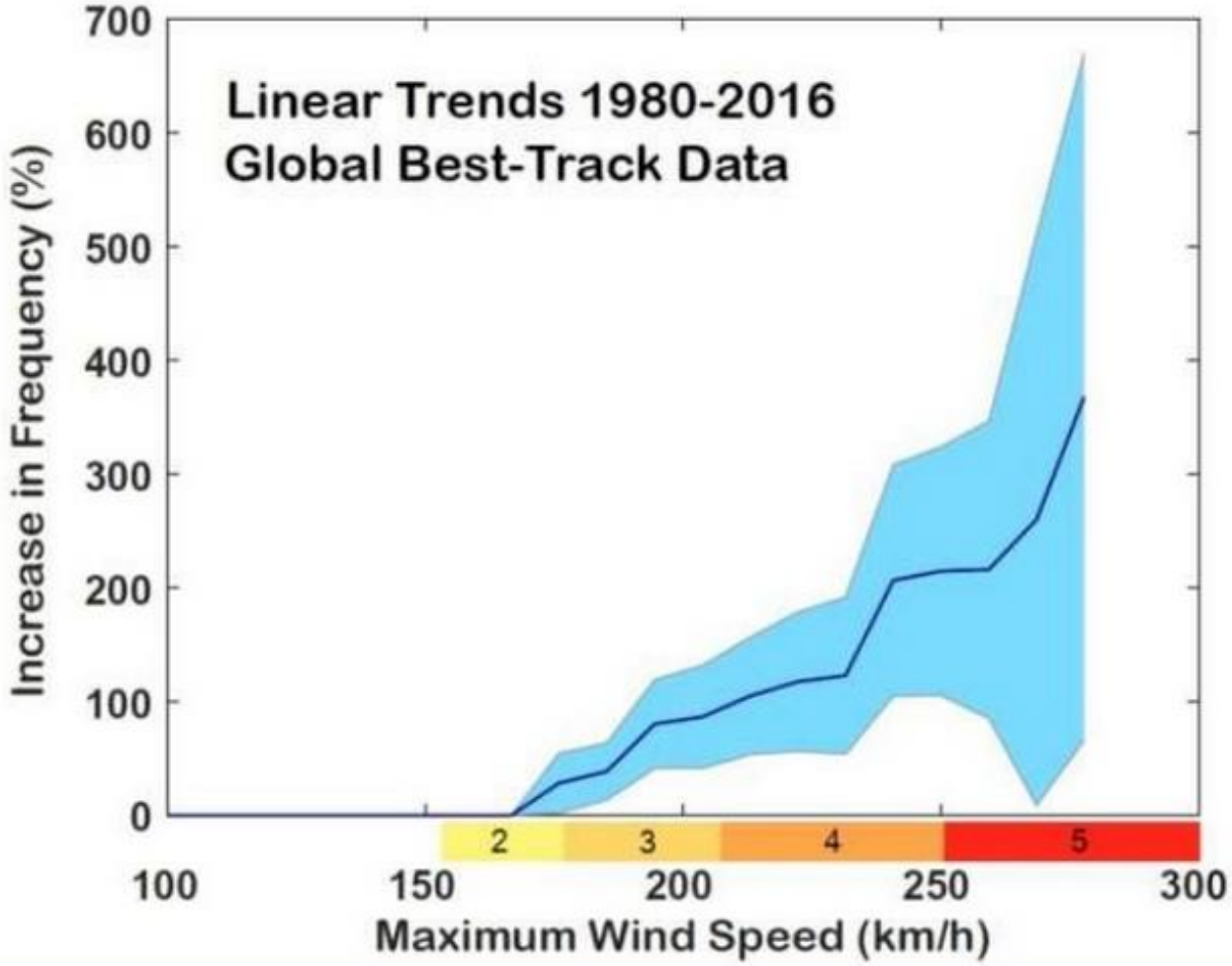
Long et al. (2016) Finding forced trends in oceanic oxygen. *Global Biogeochemical Cycles* 30: 381-397.

Takamitsu Ito, Shoshiro Minobe, Matthew C. Long, Curtis Deutsch. Upper Ocean O2 trends: 1958-2015. *Geophysical Research Letters*, 2017; DOI: 10.1002/2017GL073613

Resplandy et al. (2918) Quantification of ocean heat uptake from changes in atmospheric O2 and CO2 composition. *Nature 563:* 105-107

30th May 2018

"Global warming is making tropical cyclones stronger", renowned climatologists conclude

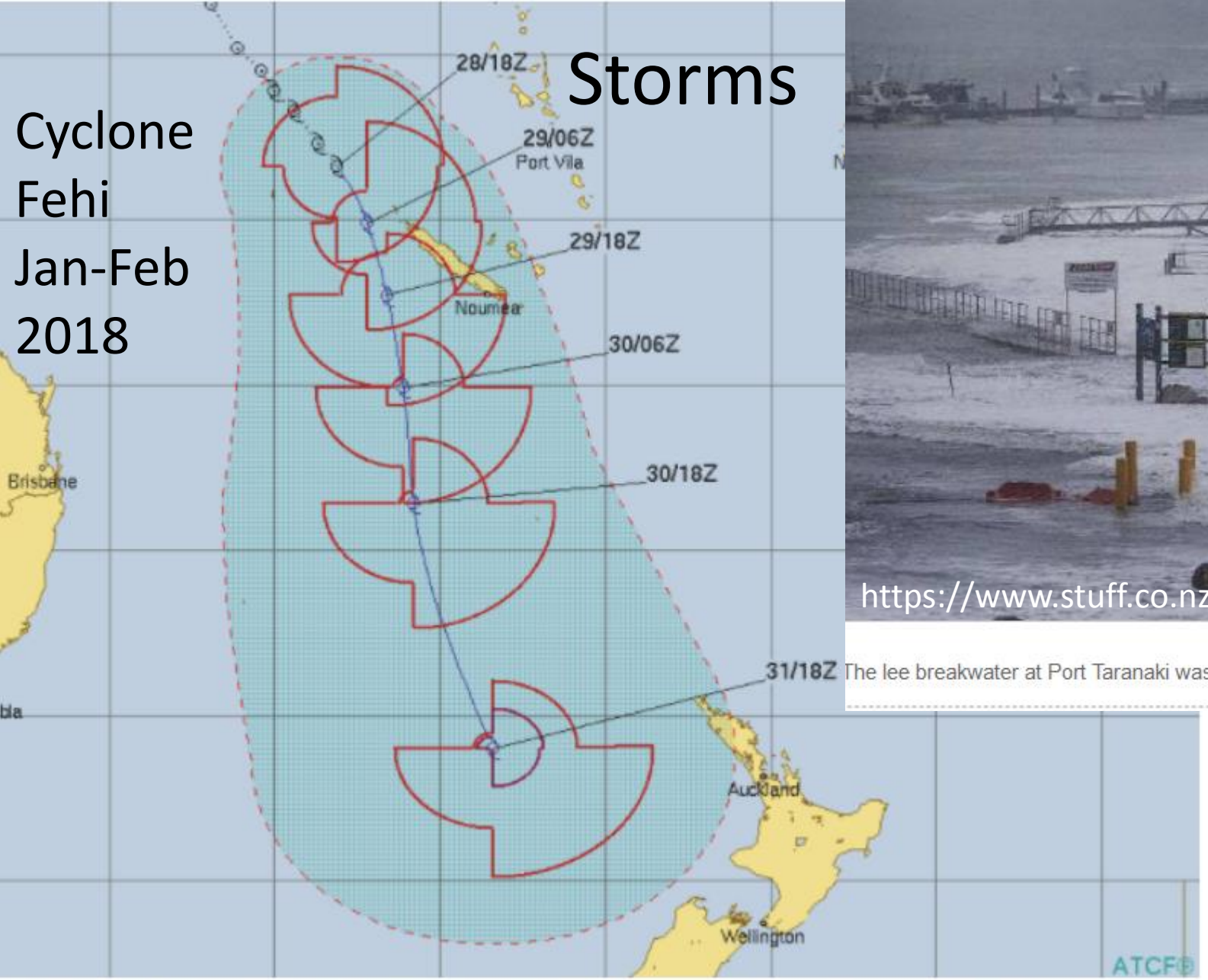


Slide courtesy of Jeremy Leggett

"Especially storms of previously unobserved strength." Very bad news for the insurance industry, and all who live in cyclone belt.

Storms

Cyclone Fehi Jan-Feb 2018



Tracking and the 'cone of uncertainty' (ie, the centre of the low may track anywhere in the shaded area) / Joint Typhoon Warning Center (US Government)

https://www.stuff.co.nz/taranaki-daily-news/news/101148777/ (3/2/18)

GRANT MATTHEW/STUFF

The lee breakwater at Port Taranaki was hammered by king tide swells on Thursday.

Increased risks to aging O&G infrastructure, Huge decommissioning costs (est. $800 million to NZ govt).

Anthropocene mass extinction

Patterns of past marine extinctions are, among other factors, linked to climate change, high levels of CO_2, acidification and deoxygenation.

'Those who do not remember the past are doomed to repeat it' (George Satayana).

Sources:

Keller, G. 2005. Impacts, volcanism and mass extinction: random coincidence or cause and effect? *Australian Journal of Earth Science* 52/4: 725-757.

Ward, P. 2007. Under a Green Sky: Global warming, the mass extinctions of the past, and what they can tell us about our future. HarperCollins, NY, 135 pp.

Veron, J.E.N. 2008. Mass extinctions and ocean acidification: biological constraints on geological dilemmas. *Coral Reefs* 27: 459-472.

Royer, D. 2008. Linkages between CO_2, climate, and evolution in deep time. *Proceedings National Academy of Science* 105: 407–408.

Cumulative Effects – ‘nothing to see here’

Cumulative effects of O&G mining applications in STB under the EEZ-CS Act have all been deemed by industry consultants to be ‘low or negligible’, taking a reductionist view, ignoring the fact that this industry is a major cause of the cumulative effects driving this extinction.

Eg. Dr. Simon Childerhouse, witness for Shell Taranaki Ltd (October 2017):

“… assessments provided in the IA and other comparable assessments undertaken for other regional activities… also have assessments of low or negligible impact (e.g. such as those evaluated by the EPA in approved consents for OMV, STOS and TTRL)”.

With a similarly sanguine view for the present Tamarind application (November 2018).

Cumulative Effects – negligible?

Independent cetacean specialists did not agree with the industry-funded assessments, and raised serious concerns.

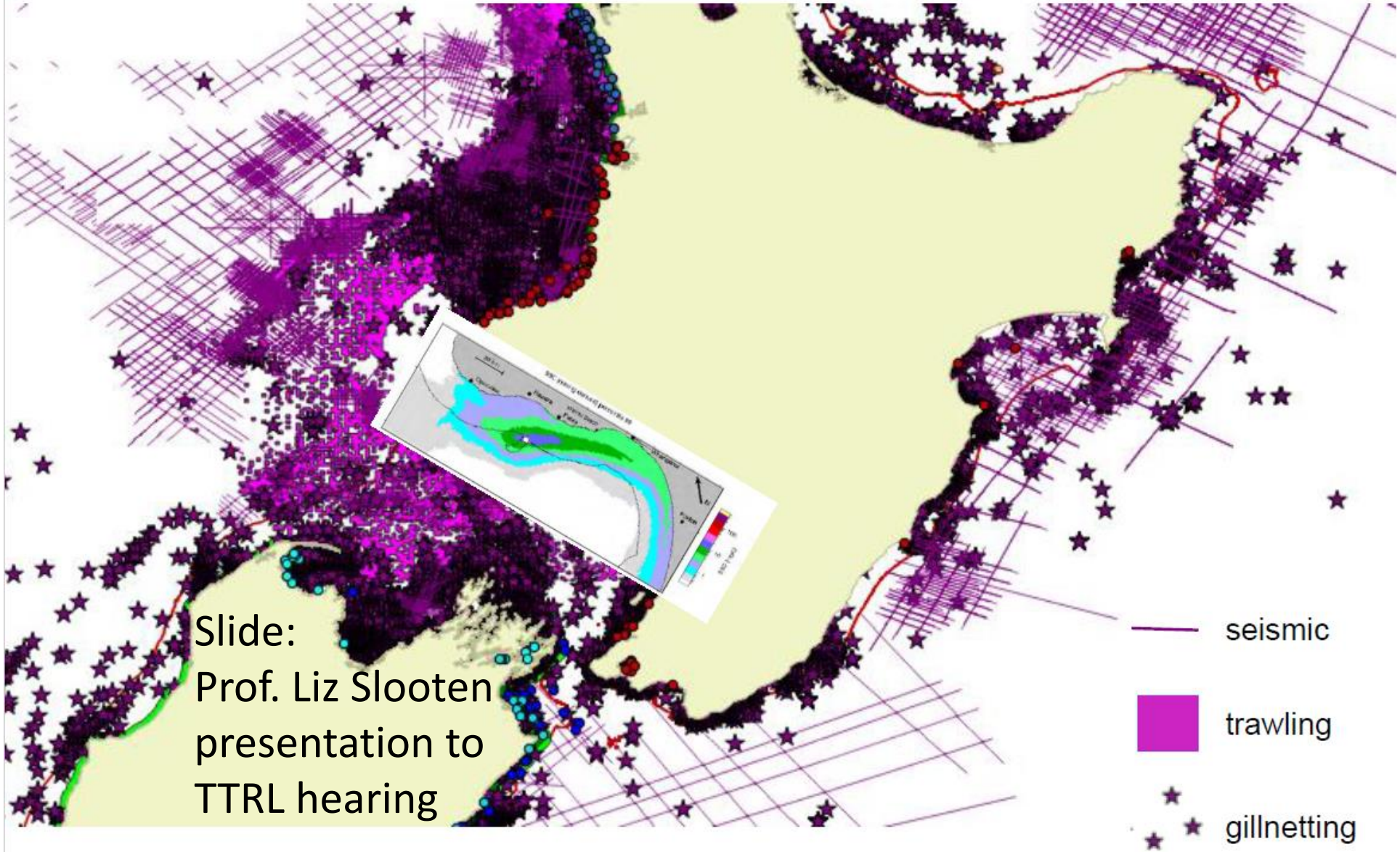
Torres et al. (2017): *"Cumulative and isolated impacts on blue whales and their habitat from these activities should be carefully considered by environmental managers. In particular, elevated anthropogenic ocean noise may disturb blue whale behavior and physiology, with consequences for individual health and population viability."*

Cumulative Effects – negligible?

"Prolonged or repeated stress can increase susceptibility to other threats and impair immune function (e.g. Wright et al. 2011). ... Coastal species, like Maui dolphins are especially vulnerable due to the concentration of human activity ... Maui dolphins are already subject to a host of synergistic and potentially cumulative stressors that may be further aggravated by the effects of noise and other impacts associated with marine mining (Forney et al. 2017)."

Quote from Prof. Liz Slooten's expert evidence for KASM, 24/1/16

NZ coast – ‘Sacrificial Zone’?



Cumulative Effects – negligible?

This all begs the obvious question:

How many ‘minor or negligible effects’ does it take to make a moderate or major impact?

Or:

How many industrial activities can be squeezed into NZ coastal zone and EEZ with ‘minor or negligible effect’ in a rapidly changing oceanographic regime?

‘Having cakes and eating them’ comes to mind.

Assessment of Cumulative Effects

Consigned to the ‘too hard basket’.
Shell Taranaki Ltd witness Dr. Simon Childerhouse stated in evidence (October 2017):

“To address cumulative impacts quantitatively is not possible, as it is not possible to collect detailed data on all potential impacts across the region and their potential interaction due to their complexity and scale.”

What happened to the Precautionary Principle?

Assessment of Cumulative Effects

There are several quantitative and semi-quantitative approaches, including modelling future projections of changing sea temperature, acidification, upwelling and productivity based on present conditions and various IPCC scenarios. This approach can examine future habitat marginality, and when coupled with population viability analyses (PVA) could provide important insights into future cumulative effects in STB on threatened species.

Why have such analyses not been conducted by the applicant or requested by EPA?
Best available information?