



Taihoru Nukurangi

Enabling management of offshore mining through improved understanding of environmental impacts A New Zealand perspective

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A presentation to the PECC Seminar
*The Management of Deep Sea Marine Resources and
Oceans as a means of Communication*

Auckland 4-5 December 2012

Offshore Mining - The Conundrum

RESEARCH ORGs

CRIs - Univ

International
Collabs.

Engagement

Research

Uptake

END USERS

Industry

Governments

Iwi - Public

Environmental Orgs

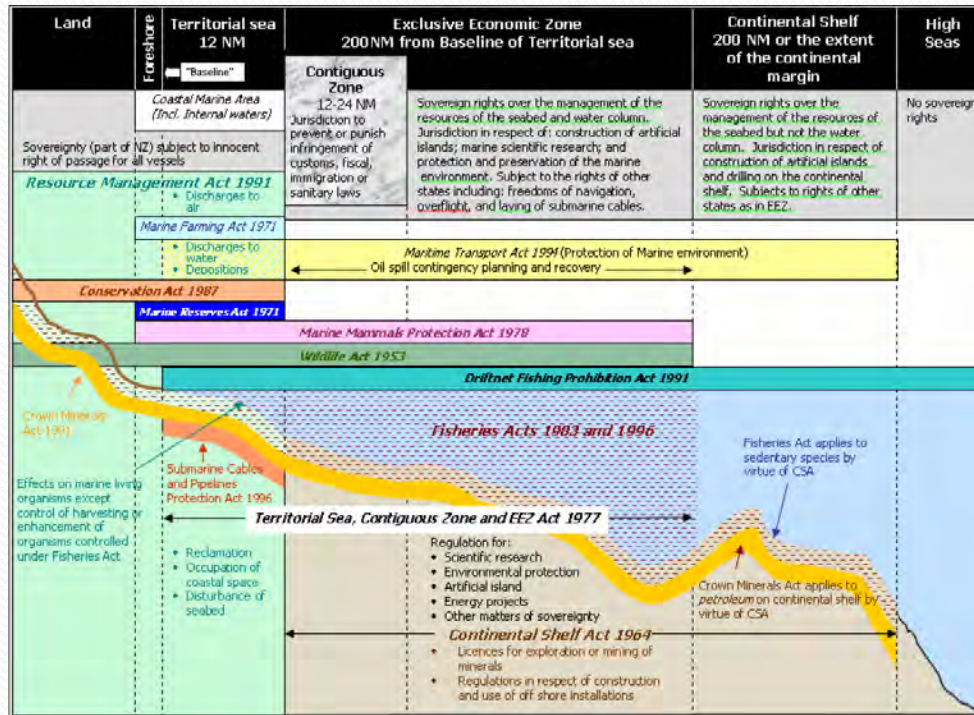
Research priorities
Social wellbeing
Treaty of Waitangi
Coastal Policy Statement
EEZ Bill, CMA, RMA
International Responsibilities
Public Perception



- Improved knowledge
- Better Public Awareness
- Responsible legislation
- Healthy & resilient marine environment
- Enhanced New Zealand prosperity
- Better access to new resources
- Environmental Management System
- Improved Vision Mātauranga



A complex, incomplete and ever changing legislation

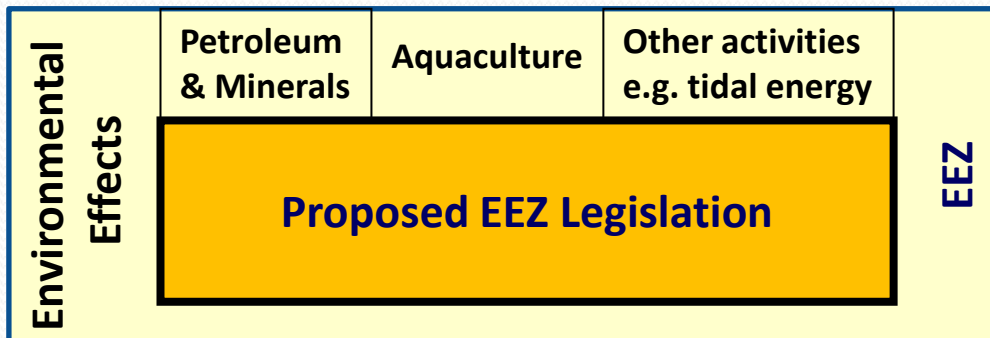


Spatial extent of relevant legislation and regulations (courtesy MfE)

- NZ currently has no specific act covering the environmental effects of mineral and oil/gas exploitation outside 12 NM

- “EEZ Environmental Effects” proposed in 2008 provide regulation

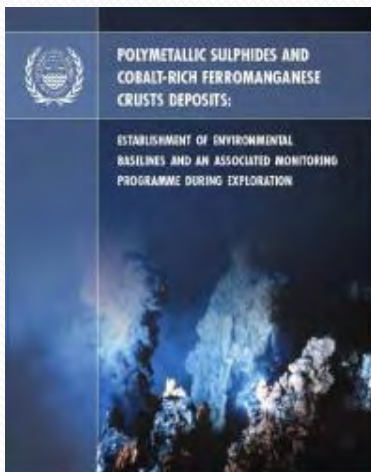
- Scientific information is a key element of this legislation to inform the development of environmental standards





CODE FOR ENVIRONMENTAL MANAGEMENT OF MARINE MINING

Adopted by the
INTERNATIONAL MARINE MINERALS SOCIETY
NOVEMBER 2, 2001
(REVISED 02/06/02)



EPA, MfE EIA, ERA, EMP



- Environmental Risk Assessment (**ERA**)
+ Environmental Impact Assessment (**EIA**)
= Environmental Management Plans (**EMP**).
- Until the EEZ Bill comes into force the Environmental Protection Agency (**EPA**) **voluntary interim measures** ask industry to prepare an EIA
- EEZ Bill (law 3 Sep 12) needs regulation
- EPA consents, monitors, enforces mining in the EEZ
- MfE develops policy, legislation and regulations
- Guidelines on developing EIA are scarce (IMMS, ISA)
- Detailed information on required research
- Need for stakeholders and scientists to work together

Key impacts to consider



Potential benthic impacts

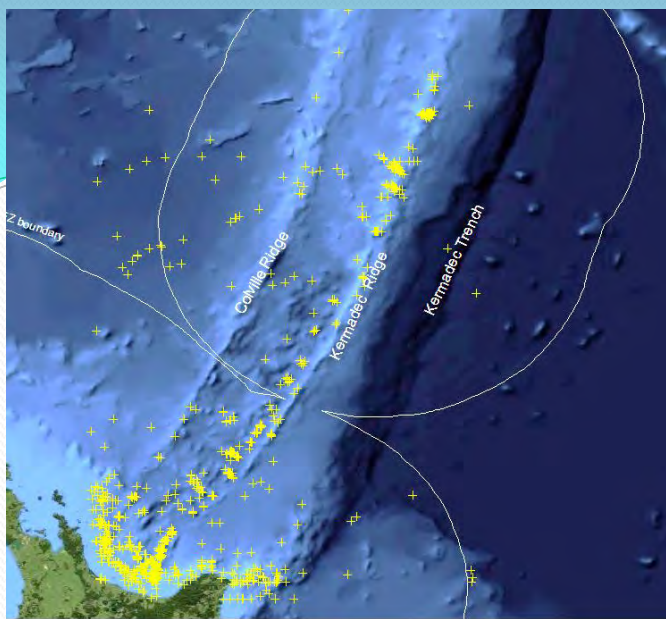
- direct physical impact of gear
- sediment smothering/burying
- toxic effects with metal release
- loss of essential habitat



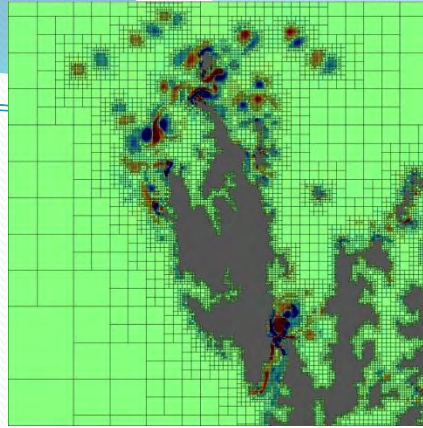
Potential water column impacts

- fish mortality
- accumulation of toxins in food chain
- sediment plume migration
- oxygen depletion
- effects on marine mammals



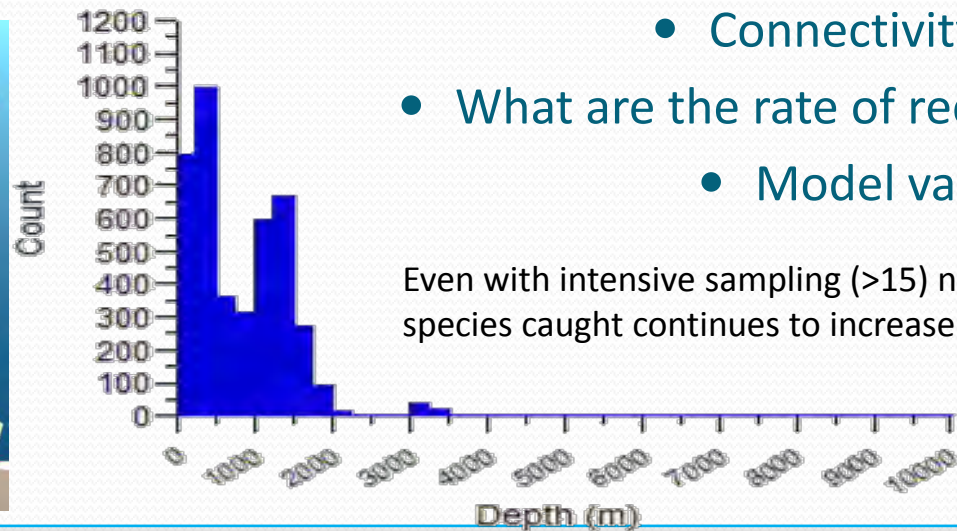
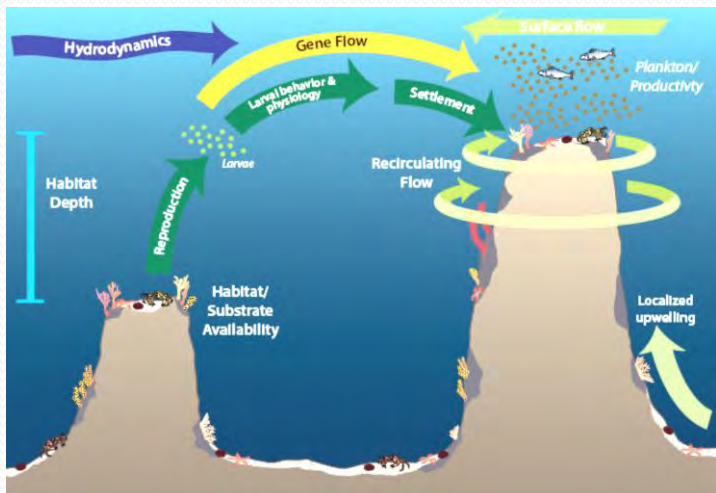


1300 benthic stations
 > 500 species of invertebrate
 ~40 demersal fish



Some Issues

- Understanding drivers is key to managing environmental effects
- More sampling needed to describe regional-scale biodiversity
- Estimates of “rarity” and endemism very difficult
 - Connectivity issues
 - What are the rate of recovery?
 - Model validation



Even with intensive sampling (>15) number of species caught continues to increase



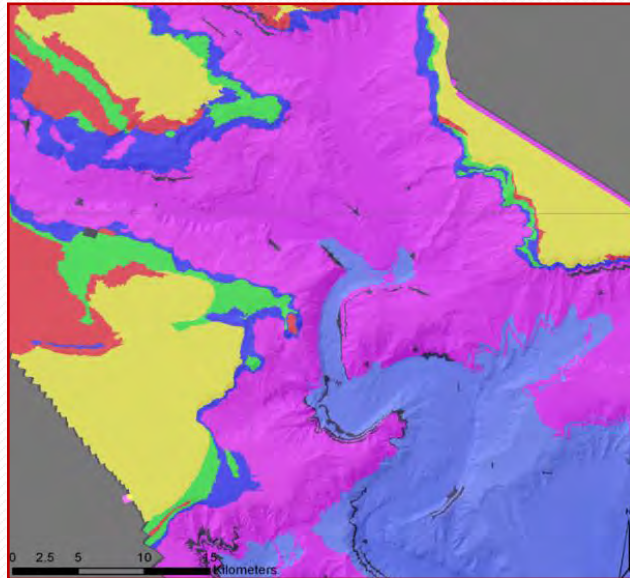
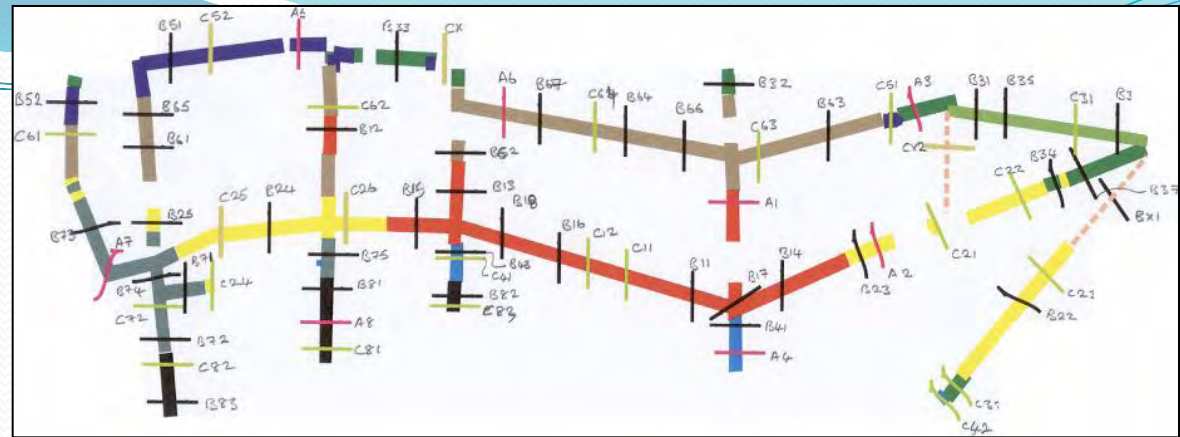
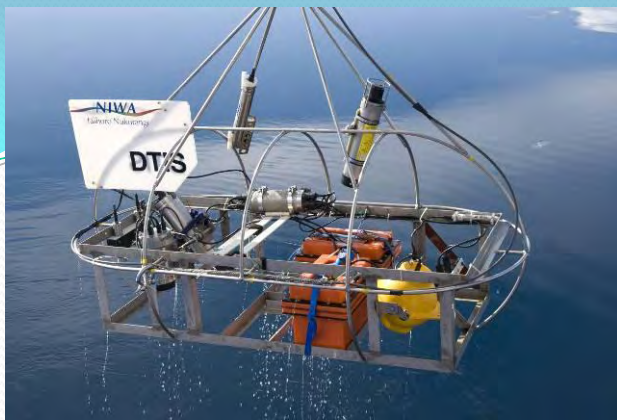
An EIA should

- include **geological, biological and physical oceanography** issues
- describe the **current state of the area and surrounding***
- identify the **actual and potential effects of the activity on the environment** (including cumulative effects and high seas)*
- specify **possible alternative locations or methods** [...] that may avoid, remedy, or mitigate any adverse effects*

Detail should corresponds to the **scale and significance of the effects** that the activity may have on the environment and existing interests

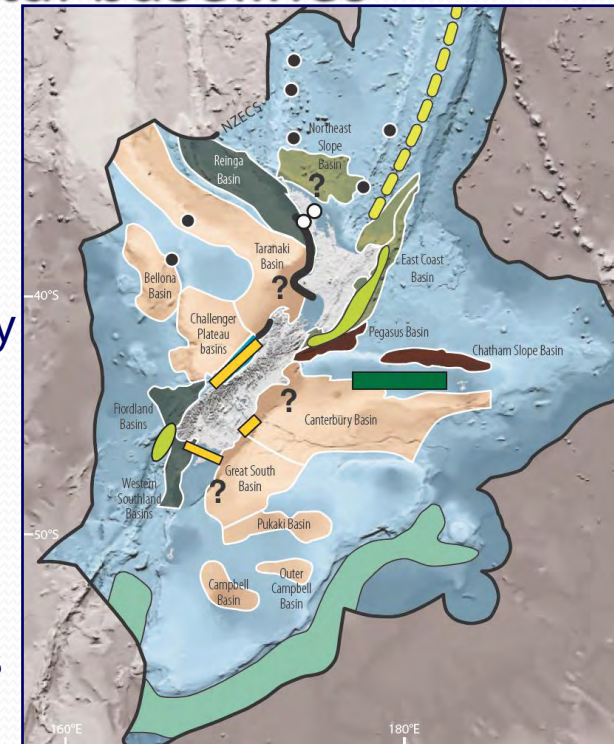
** from "Impact Assessment Guidance"*





Environmental baselines

- Sampling strategies
 - Statistical analysis
 - Faunal assemblages
 - Communities vulnerability
 - Recovery rates
- Mapping nature and distribution
 - Predict response to **resource use pressures**
 - Requirement for **monitoring**



| Risk Level | Consequence | Likelihood | Category |
|------------|-------------|------------|----------------------------------------------------------------|
| Low | 0 | 1-6 | Permitted with appropriate conditions. |
| | 1 | 1-6 | |
| | 2 | 1-3 | |
| | 3 | 1-2 | |
| | 4 | 1 | |
| | 5 | 1 | |
| Moderate | 2 | 4-6 | Discretionary (pending possible mitigation measures) |
| | 3 | 3-4 | |
| | 4 | 2-3 | |
| | 5 | 2 | |
| High | 3 | 5-6 | |
| | 4 | 4-5 | |
| | 5 | 3-4 | |
| Extreme | 4 | 6 | Prohibited |
| | 5 | 5-6 | |

Risk Analysis

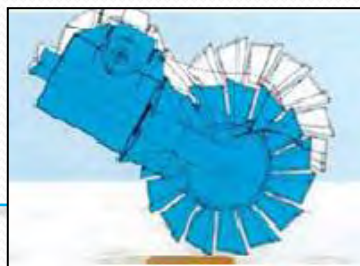
from NIWA Risk Assessment report (MfE 2012).

Consequence

1-Negligible
2-minor
3-moderate
4-severe
5-major
6-catastrophic

Likelihood:

1-Remote
2-Rare
3-Unlikely
4-Possible
5-Occasional
6-Likely



26 yrs of dredging the CCZ



He aha te mea nui? He tangata; He tangata; He tangata.

Māori Expectations

- Strategic Relationships/Transactional Arrangements
- Increase in demand for specific science expertise
- We need to understand the local Māori economic drivers i.e. employment/iwi sustainability versus environmental sustainability etc

In 2010, Māori Economy estimated at \$36.9b

Exploration

- **Kaitiakitanga:** Iwi and hapū role to ensure protection of taonga for future generations
- **Partnerships:** Some Māori businesses and funds managers have equity invested in exploration companies – know the landscape

Cultural Impact Assessments

- **Early consultation:** With governance and hapū representatives, be clear about expectations
- **Start early with observations,** get hapū involved with field work
- **Ensure the monitoring framework includes observations based on Māori knowledge**

Research strategy

Government agencies (MfE, NZPAM, MfE,...)
Science institutions (NIWA, GNS, ...)
Stakeholders (Neptune, CRP, TTR, ...)

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← MBIE, stakeholders etc

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- Research Programmes
- Interdisciplinary
- Multi-institute
- International

Baseline Information
Monitoring
Conservation" science

Effective Environmental
Management

What science is needed?

To balance exploitation of
resources with conservation
of habitat and ecosystems

Delivered via EEZ scale legislation led by a
single government agency (MfE?)

Enabling management of offshore mining through improved understanding of environmental impacts

NIWA's response:
a 4 years MBIE
funded research
programme

Oct 2012

Oct 2016

RA1 – Science guidelines for management of offshore mining

Engagement

Guidelines

Validation

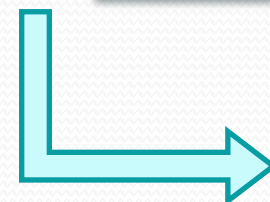
Framework and template



RA2 – Critical Research needs

Gap Analysis

Sediment disturbance – Ecotoxicity
Habitat vulnerability & recovery



RA3 – Environmental baseline and monitoring plans

Spatial design

Facilitate communication

Impact on cultural values



\$1,595,000
2012-2016

- Improved knowledge
- Better Public Awareness
- Responsible legislation
- Healthy & resilient marine environment
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