

Working Paper 2021/15

# Looking for a taxonomy for Aotearoa New Zealand's oceans

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## 1.0 Introduction

This working paper identifies terminology commonly used when discussing oceans management in Aotearoa New Zealand.

## 2.0 Background

During October 2021 the Institute attended New Zealand King Salmon's (NZKS) Marlborough District Council resource consent application hearing. The application is to establish and operate two new salmon farms in northern Marlborough (what is commonly referred to as the Cook Strait).<sup>1</sup>

The consent hearing highlighted inconsistencies in how terminology is used. That is, what area is being referred to, by what term, and in what context. This was especially apparent in relation to the terms 'inshore', 'offshore', and 'open ocean'.

## 3.0 Methodology

This working paper aims to understand whether a common taxonomy of ocean management terms exists, and where inconsistencies in terminology arise, by undertaking a scoping of oceans literature. A taxonomy is a comprehensive classification system with a hierarchy of key terms to enable researchers to consistently analyse and compare data in a meaningful way over time.

Another working paper in the series is *Working Paper 2021/14 – The Role of Ocean Water Temperature in Climate Change Policy – A New Zealand King Salmon Case Study*. These working papers aim to collate and illustrate the impacts of climate change on public policy, which will then be canvassed in our upcoming 2058 report: *Report 18 – A Climate Change Strategy for Aotearoa New Zealand*.

The research method *Working Paper 2021/14* followed three key steps:

First, the terms and focus on terms commonly used at the consent hearing. These were: 'inshore', 'offshore', 'open ocean' and other closely related terms.

Second, a search was undertaken of Aotearoa New Zealand literature across four broad sectors:

A: Strategy – Resource management and fisheries

B: Science – Marine biology, ecology and geology

C: Risk Management – Maritime

D: Geography – Territorial boundaries

E: Mining – Marine resource extraction

The sources used in this scoping research are predominantly government reports and legislation. These sources are used because the Institute is interested in the quality of oceans regulation – government reports and legislation both reflect and guide how decision-makers understand and use key terms.

## 4.0 Results

The results of the initial scoping are set out in Table 1: Existing oceans terminology.

It was not uncommon for the literature to include maps and diagrams to highlight the areas of ocean; a selection of maps and diagrams is included in Figures 1 – 4.

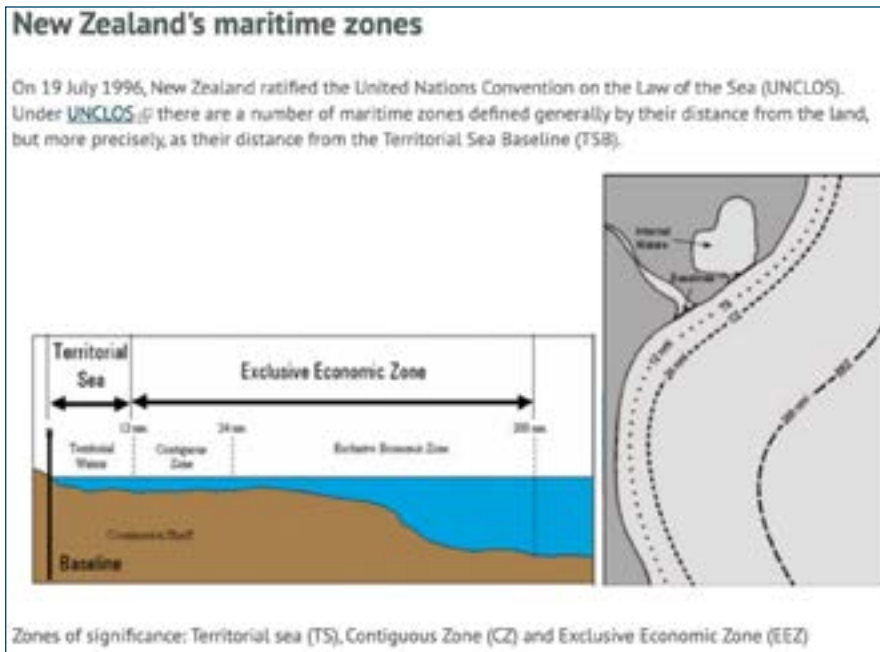
**Table 1: Existing oceans terminology**

Term	Definition	Source
<b>A: Strategy – Resource management and fisheries</b>		
Coastal water	‘means seawater within the outer limits of the territorial sea and includes (a) seawater with a substantial fresh water component; and (b) seawater in estuaries, fiords, inlets, harbours, or embayments’.	Resource Management Act 1991 <sup>2</sup>
Deepwater and middle-depth fisheries	‘Deepwater and middle-depth fisheries are between 12 and 200 nautical miles offshore. This reaches the limit of New Zealand’s exclusive economic zone (EEZ).’	MPI <sup>3</sup>
Foreshore	‘means any land covered and uncovered by the flow and ebb of the tide at mean spring tides and, in relation to any such land that forms part of the bed of a river, does not include any area that is not part of the coastal marine area.’	Resource Management Act 1991 <sup>4</sup>
Inshore fisheries	‘Inshore fisheries include: the area of ocean as far out as about 12 nautical miles from the coast of New Zealand, and waterways within New Zealand (like lakes and rivers) ... Beyond the inshore fisheries are: the middle-depth and deepwater fisheries and international waters (the high seas).’	MPI <sup>5</sup>
New Zealand fisheries waters	‘means: (a) all waters in the exclusive economic zone of New Zealand: (b) all waters of the territorial sea of New Zealand: (c) all internal waters of New Zealand: (d) all other fresh or estuarine waters within New Zealand where fish, aquatic life, or seaweed that are indigenous to or acclimatised in New Zealand are found.’	Fisheries Act 1996 <sup>6</sup>
Open coastal water	‘means coastal water that is remote from estuaries, fiords, inlets, harbours, and embayments’.	Resource Management Act 1991 <sup>7</sup>
<b>B: Science – Marine biology, ecology and geology</b>		
Inshore	‘Generally within 5 km of the coastline and < 50 m depth. Same as coastal seas. In the UK, the term “Inshore” applies specifically to the area within 6 nm of the coast where marine activities are managed at a local or regional scale.’	Costello et al, University of Auckland <sup>8</sup>
Oceanic	‘Referring to the open ocean, away from coastal waters.’	Costello et al, University of Auckland <sup>9</sup>
Offshore	‘Open ocean distant from land, typically with stable water column characteristics (stenothermal, stenohaline), permanently stratified, beyond freshwater influence, without benthic algae. Generally > 5 km from the coastline.’	Costello et al, University of Auckland <sup>10</sup>
Offshore reefs	‘A ridge of rock with the top just below or just above the surface which is located at some distance from the shore.’	NIWA <sup>11</sup>

C: Risk Management – Maritime		
Coastal limits	‘(a) means those areas of the sea having, as their inner limits, the baseline described in sections 5, 6 and 6A of the Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977 and, as their outer limits, a line measured seaward from that baseline, every point of which is 50 miles from the nearest point of the baseline; but (b) does not include areas having, as their inner limits, the baseline along the coast of the Kermadec Islands, the Auckland Islands, the Antipodes Islands, the Bounty Islands, the Campbell Island / Motu Ihupuku group, Snares Islands / Tini Heke and Esperance rock.’	Maritime NZ (operating limits) <sup>12</sup>
Inshore fishing limits	‘(a) means all the water within the territorial sea of New Zealand (excluding those areas that have the inner limits described in paragraph (b) of the definition of coastal limits) and the waters of the coastal limits north of a line from 46° 42’S 167° 08’E to 46° 42’S 167° 18’E that provide direct access to Solander Island (Hautere) from Foveaux Strait; and (b) includes any areas of the inshore limits set out in Part 2 of Appendix 1 that extend beyond the limits of the territorial sea’	Maritime NZ (operating limits) <sup>13</sup>
New Zealand inland waters	‘means all rivers, lakes and other inland waters of New Zealand, which are navigable.’	Maritime NZ (operating limits) <sup>14</sup>
Offshore limits	‘means those areas of the sea that are beyond and adjacent to the coastal limits, having as their outer limits a line measured seaward from the baseline described in sections 5, 6 and 6A of the Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977, every point of which is 200 miles from the nearest point of the baseline.’	Maritime NZ (operating limits) <sup>15</sup>
D: Geography – Territorial boundaries		
Internal waters	‘the internal waters of New Zealand include any areas of the sea that are on the landward side of the baseline of the territorial sea of New Zealand.’	Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977 <sup>16</sup>
Internal waters	‘the internal waters are all those areas of the sea that are on the inside of New Zealand including any areas of the sea that are on the landward side of the baseline of the territorial sea of New Zealand.’	LINZ <sup>17</sup>
Exclusive Economic Zone (200nm limit)	‘The Exclusive Economic Zone is an area of sea beyond and adjacent to the territorial sea. The outer limit of the exclusive economic zone cannot exceed 200 nautical miles from the territorial sea baseline. Where the New Zealand EEZ abuts the maritime zone of another nation, a median line between the nations is agreed.’	LINZ <sup>18</sup>
New Zealand Territorial Seas	‘Includes all islands within 12 miles of the coast of the North Island, includes North, South, Solander, Stewart, White and Volkner Islands but excludes Three Kings Islands.’	LINZ <sup>19</sup>
Territorial sea	‘the territorial sea of New Zealand comprises those areas of the sea having, as their inner limits, the baseline described in sections 5 and 6 and 6A and, as their outer limits, a line measured seaward from that baseline, every point of which line is distant 12 nautical miles from the nearest point of the baseline.’	Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977 <sup>20</sup>

Territorial Sea (12nm limit):	‘The Territorial Sea is an area of water not exceeding 12 nautical miles in width which is measured seaward from the territorial sea baseline.’	LINZ <sup>21</sup>
Territorial sea limit	‘Defined by the 1982 United nations Convention on the Law of the Sea as a belt of coastal waters extending at most 12 nautical miles (22 km; 14 miles) from the baseline (usually the mean low-water mark) of a coastal state. The territorial sea is regarded as the sovereign territory of the state, although foreign ships (both military and civilian) are allowed innocent passage through it; this sovereignty also extends to the airspace over and seabed below.’	NIWA <sup>22</sup>
<b>E: Mining – Marine resource extraction</b>		
New Zealand’s offshore waters	‘These waters include both our Exclusive Economic Zone (EEZ) and Continental Shelf (CS), and our territorial waters.’  ‘New Zealand’s offshore waters cover an area of more than six million square kilometers – more than 20 times our land area and the world’s fourth-largest area of seabed.’	NZPAM <sup>23, 24</sup>
Offshore	‘... anywhere that is the seaward side of the mean high-water mark.’	Crown Minerals Act 1991 <sup>25</sup>

Figure 1: LINZ – New Zealand’s maritime zones<sup>26</sup>



This diagram can be compared with the UK Marine Management Organisation (MMO) jurisdictional boundaries (in the context of marine licensing) including definitions of ‘inshore’ and ‘offshore’ below:

Figure 2: UK MMO jurisdiction diagram<sup>27</sup>

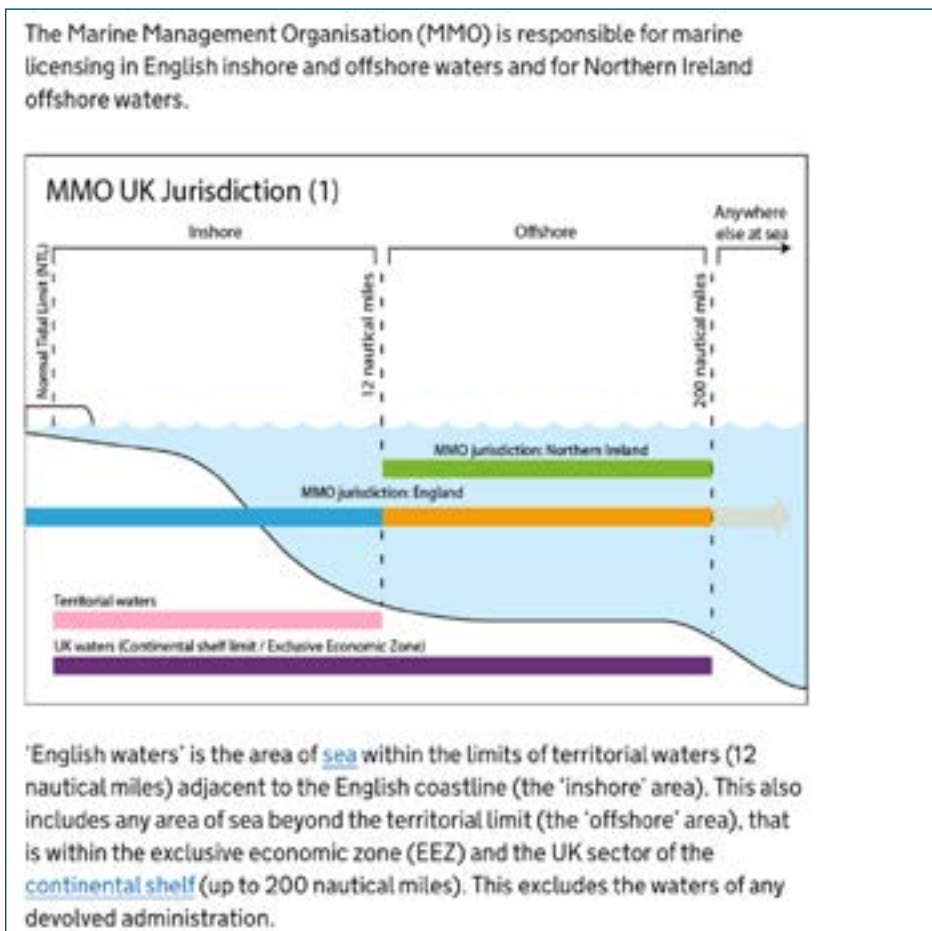




Figure 3: Maritime New Zealand operational limits diagram (non-fishing vessel operational limits)<sup>28</sup>

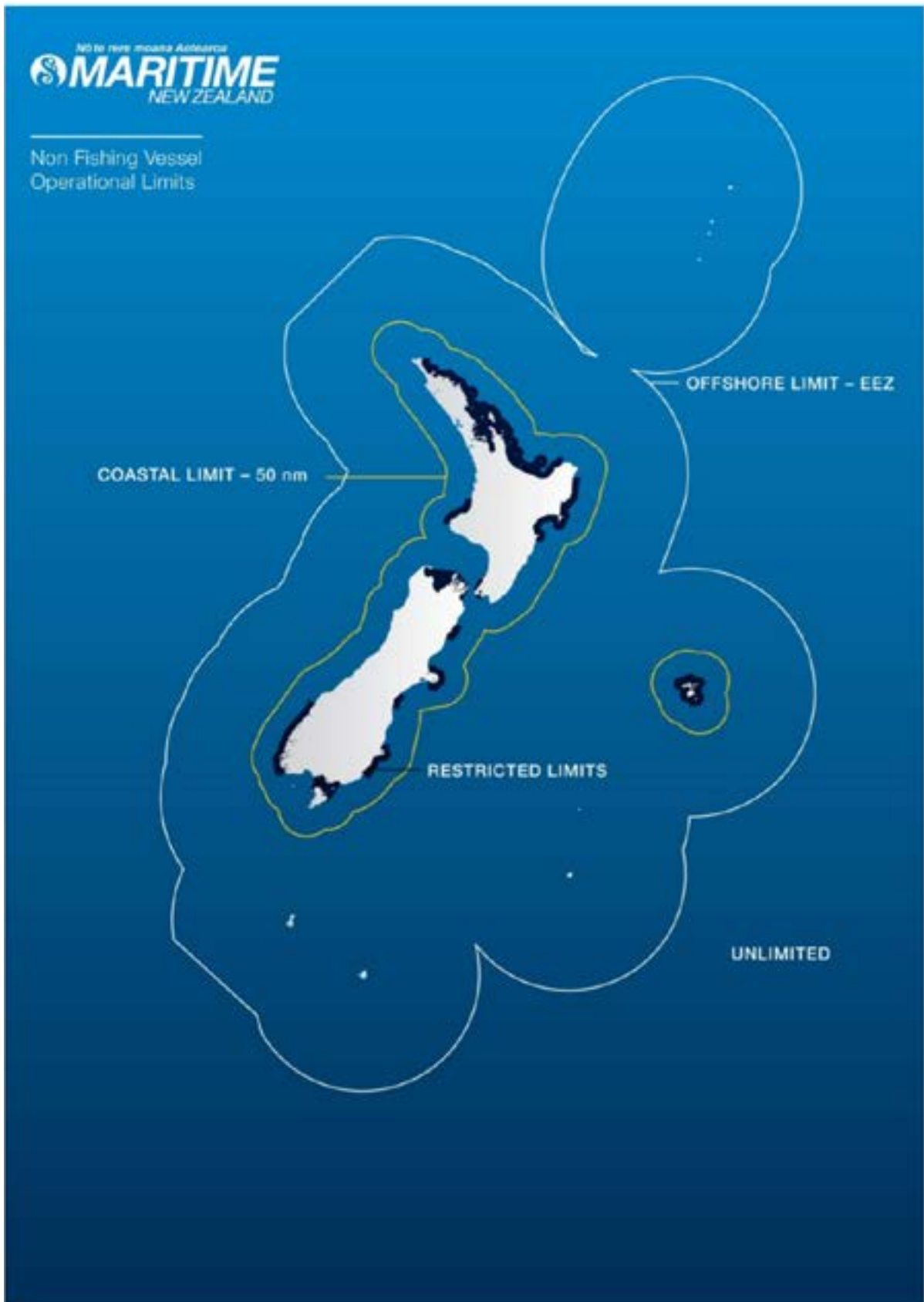
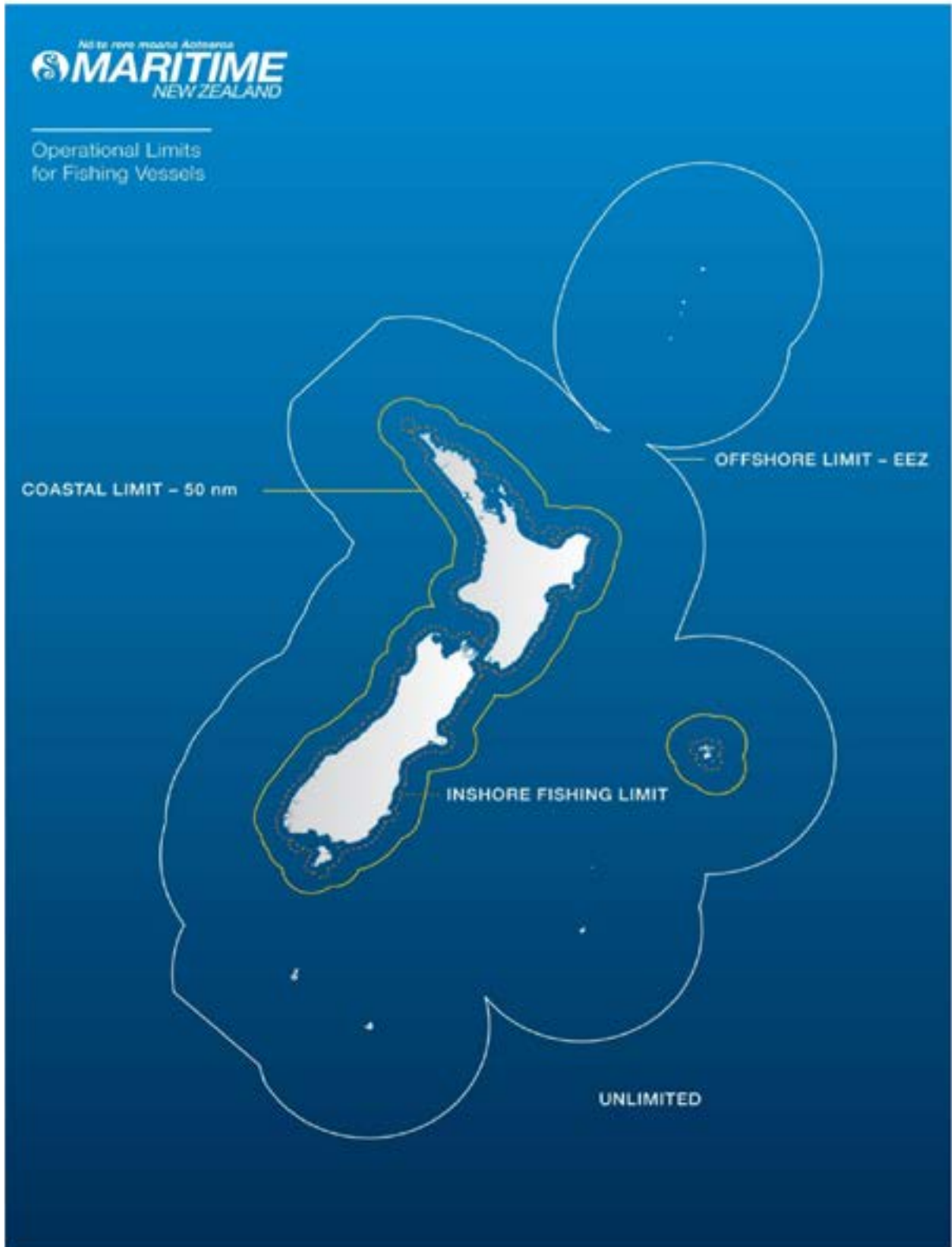


Figure 4: Maritime New Zealand operational limits diagram (operational limits for fishing vessels)<sup>29</sup>



## 5.0 Discussion

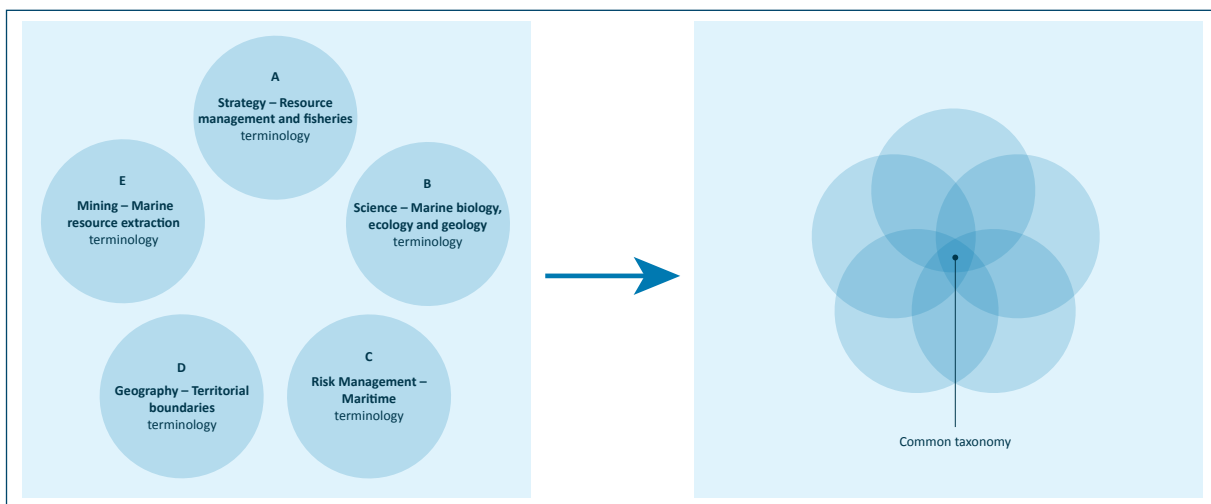
This initial scoping research found a lack of oceans terminology taxonomy, and highlighted inconsistencies. For example;

- The meaning of terms varied by sectors. For example, ‘inshore’ in the fisheries context has been used to mean ‘the area of ocean as far out as about 12 nautical miles from the coast of New Zealand, and waterways within New Zealand (like lakes and rivers).’<sup>30</sup> In the marine biology, ecology and geology context ‘inshore’ has been used to refer to areas ‘generally within 5 km of the coastline and < 50 m depth.’<sup>31</sup> Note: 12 nautical miles is equivalent to 22km.
- Where consistency across terms does exist, it is largely in relation to New Zealand’s territorial boundaries. This is no doubt a result of the implications these definitions have for New Zealand sovereignty and jurisdiction.

The Institute’s view is that the lack of common taxonomy will present difficulties for ocean management down-stream as New Zealand increasingly confronts challenges such as pollution, warming temperatures, rising sea levels, changes in currents and biodiversity loss in its oceans.

A common oceans language is urgently required to improve the quality of public discourse and deliver better long-term outcomes for our oceans.

Figure 5: Developing a common ocean taxonomy



## Endnotes

- 1 See Marlborough District Council (MDC). (n.d.). *U190438 – Proposed New Salmon Farms – Blue Endeavour*. Retrieved 16 November 2021 from <https://eservices.marlborough.govt.nz/programmes/ListProgrammeEvents?id=3516198>.
- 2 See Resource Management Act 1991, s 2 definition of ‘Coastal water’. Retrieved 16 November 2021 from <https://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html>.
- 3 See Ministry of Primary Industries (MPI) Manatū Ahu Matua. (16 November 2020). *Deepwater fisheries*. Retrieved 15 November 2021 from <https://www.mpi.govt.nz/fishing-aquaculture/fisheries-management/deepwater-fisheries>.
- 4 See Endnote 2, s 2 definition of ‘Foreshore’.
- 5 See Ministry of Primary Industries (MPI) Manatū Ahu Matua. (16 November 2020). *Inshore Fisheries*. Retrieved 15 November 2021 from <https://www.mpi.govt.nz/fishing-aquaculture/fisheries-management/inshore-fisheries>.
- 6 See Fisheries Act 1996, s 2 ‘definition of New Zealand fisheries waters’. Retrieved 16 November 2021 from <https://www.legislation.govt.nz/act/public/1996/0088/latest/DLM394192.html>.
- 7 See Endnote 2, s 2 definition of ‘Open coastal water’.
- 8 See Costello MJ, Harris P, Pearce B, Fiorentino A, Bourillet J-F, Hamylton S (editors). (16 May 2019). *A glossary of terminology used in marine biology, ecology, and geology. Version 2.0*. University of Auckland. Retrieved 21 October 2021 from <https://www.oceansofbiodiversity.auckland.ac.nz/2019/05/16/a-glossary-of-terminology-used-in-marine-biology-ecology-and-geology>.
- 9 See Endnote 8.
- 10 See Endnote 8.
- 11 See NIWA. (n.d.). *Glossary of Coastal Terms*. Retrieved 21 October 21 from <https://niwa.co.nz/node/105597>.
- 12 See Maritime New Zealand. (1 October 2020). *Martime Rules Part 20: Operating Limits*. Wellington: Maritime New Zealand, part 20.2, p. 1. Retrieved 16 November 2021 from <https://www.maritimenz.govt.nz/rules/part-20/>. Part 20 of the Rules applies to ‘New Zealand ships which are commercial ships, Foreign ships operating commercially in New Zealand waters, Foreign fishing vessels registered under the Fisheries Act 1996’; see p. i.
- 13 See Maritime New Zealand. (1 October 2020). *Martime Rules Part 20: Operating Limits*. Wellington: Maritime New Zealand, part 20.2, p. 1. Retrieved 16 November 2021 from <https://www.maritimenz.govt.nz/rules/part-20/>.
- 14 See Endnote 12.
- 15 See Endnote 12.
- 16 See Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977, s 4. Retrieved 16 November 2021 from <https://www.legislation.govt.nz/act/public/1977/0028/latest/DLM442667.html>. The term was recently used by Jacinda Ardern in the context of New Zealand’s nuclear free policy; ‘Ardern said the nuclear-powered submarines would not be allowed in New Zealand waters under a 1984 nuclear-free zone policy. “Certainly they couldn’t come into our internal waters. No vessels that are partially or fully powered by nuclear energy is able to enter our internal borders”’; see Menon, P. (16 September 2021). NZ says Australia’s new nuclear submarines must stay out of its waters. *Reuters*. Retrieved 16 November 2021 from <https://www.reuters.com/world/china/nz-says-australias-new-nuclear-submarines-must-stay-out-its-waters-2021-09-16>.

- 17 See Toitū Te Whenua Land Information New Zealand (LINZ). (n.d.). *Maritime Boundary Definitions*. Retrieved 16 November 2021 from <https://www.linz.govt.nz/sea/nautical-information/maritime-boundaries/maritime-boundary-definitions>.
- 18 See Endnote 17.
- 19 See Toitū Te Whenua Land Information New Zealand (LINZ). (n.d.). *Maritime Boundary Downloads*. Retrieved 16 November 2021 from <https://www.linz.govt.nz/sea/nautical-information/maritime-boundaries/maritime-boundary-downloads#nz>.
- 20 See Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977, s 3. Retrieved 16 November 2021 from <https://www.legislation.govt.nz/act/public/1977/0028/latest/whole.html>.
- 21 See Endnote 17.
- 22 See National Institute of Water and Atmospheric Research (NIWA). (n.d.). *Glossary of Coastal Terms*. Retrieved 21 October 21 from <https://niwa.co.nz/node/105597>.
- 23 See New Zealand Petroleum & Minerals (NZPAM). (n.d.). *Who does what in NZ's offshore waters?*, p. 1. Retrieved 30 November 2021 from <https://www.nzpam.govt.nz/assets/Uploads/our-industry/factsheets/nz-offshore-waters.pdf>
- 24 See New Zealand Petroleum & Minerals (NZPAM). (n.d.) *Seabed Mining*, p. 11. Retrieved 30 November 2021 from <https://www.nzpam.govt.nz/assets/Uploads/our-industry/factsheets/seabed-mining.pdf>.
- 25 See Crown Minerals Act 1991, s 2, definition of 'offshore'. Retrieved 30 November 2021 from <https://www.legislation.govt.nz/act/public/1991/0070/latest/DLM242543.html>
- 26 See Endnote 17.
- See also Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977, s 9. Retrieved 30 November 2021 from <https://www.legislation.govt.nz/act/public/1977/0028/latest/DLM442682.html#DLM442682>
- 27 See Marine Management Organisation (MMO). (20 May 2019). *Marine licensing – definitions*. Gov. UK. Retrieved 21 October 2021 from <https://www.gov.uk/guidance/marine-licensing-definitions>.
- 28 See Maritime New Zealand. (1 October 2020). *Martime Rules Part 20: Operating Limits*. Wellington: *Maritime New Zealand*, p. 17. Retrieved 16 November 2021 from <https://www.maritimenz.govt.nz/rules/part-20/>.
- 29 See Maritime New Zealand. (1 October 2020). *Martime Rules Part 20: Operating Limits*. Wellington: *Maritime New Zealand*, p. 18. Retrieved 16 November 2021 from <https://www.maritimenz.govt.nz/rules/part-20/>.
- 30 See Endnote 5.
- 31 See Endnote 8.



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