

Environmental management initiatives being started by SBMA

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Runanga Takere Moana
COOK ISLANDS



Contents

SBMA's environmental management initiatives are in addition to regulatory requirements involving environmental reporting and studies due from the exploration licences. These initiatives aim to provide an effective framework and resources to promote better understanding of the marine environment within our Marae Moana.

- **HMZ's** – Habitat Management Zones
- **REMP** – Regional Environmental Management Plan
- **CIA** – Cumulative Impact Assessment
- **rpSEP** - Research permit for small environmental work programs
- **CSD** – Cook Islands Seabed Minerals and Environment Database
- **DEEPEND** – International Marine Genetic Resources and biodiversity research

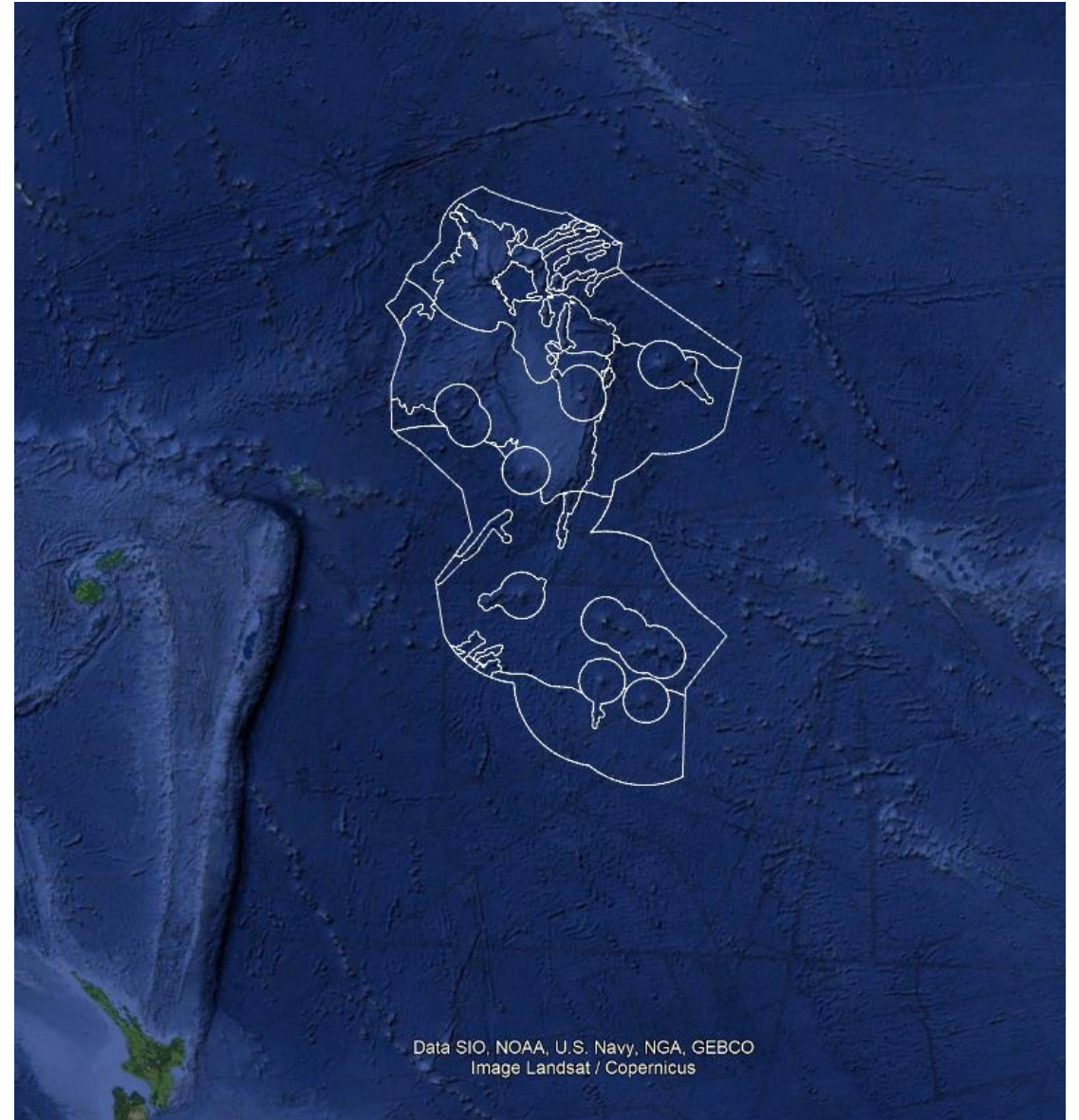


HMZ Purpose and Notes

1. The Level 1 seabed habitat management zones* presented here:
 - Give us a high level view of habitats in the CI EEZ (plus ECS**);
 - Tell us how much of the types of seabed are being explored
2. A contribution for the deep seabed component for marine spatial planning for Marae Moana

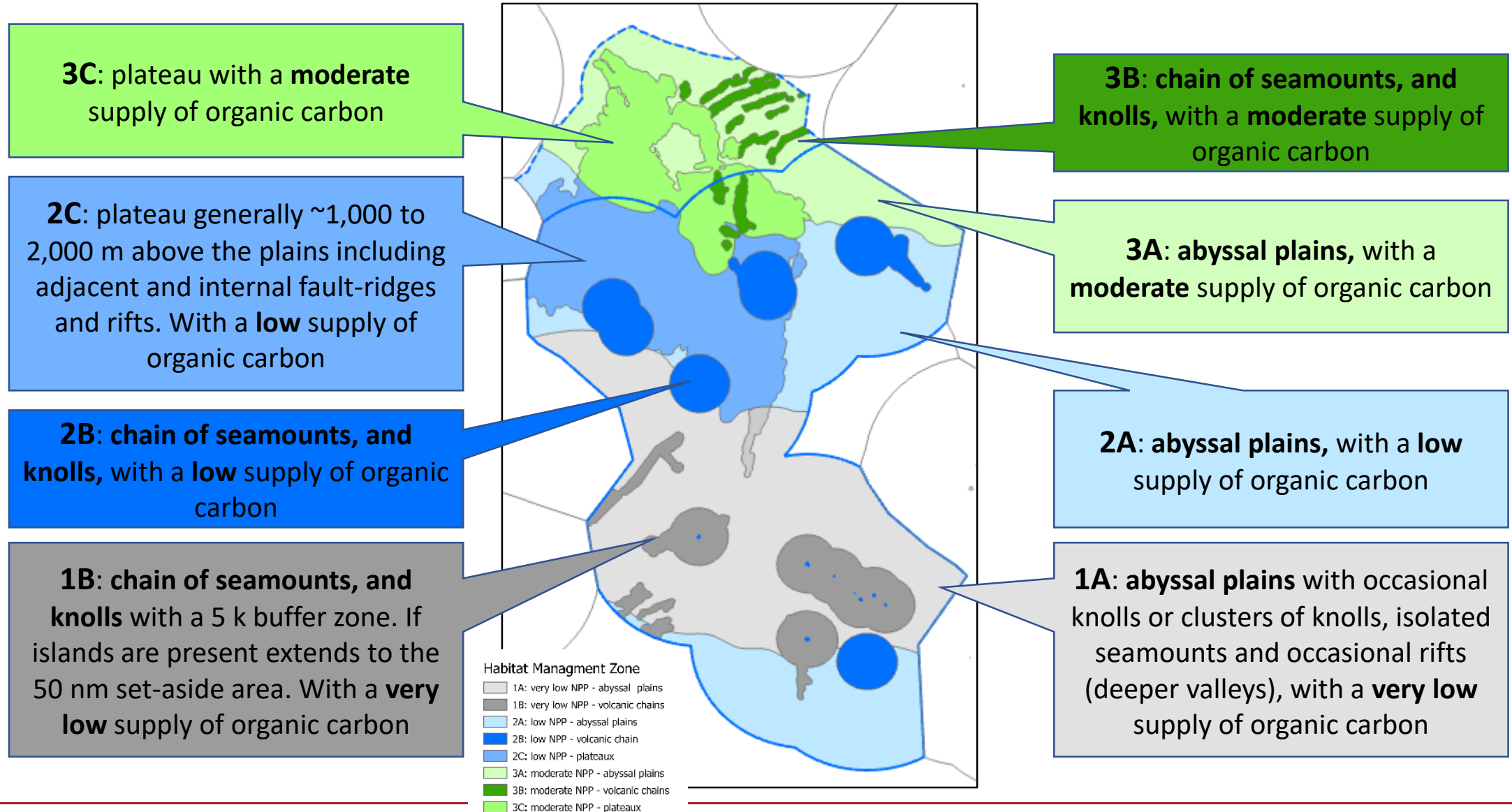
*A *habitat management zone* will likely include ?slightly different *habitat types* (issue of scale). Then different habitat types and habitat management zones may use the same *1*.

**CI EEZ is Cook Islands Exclusive Economic Zone and ECS is extended continental shelf [submission](#)





What are the Habitat Management Zones





General Approach – Habitat Management Zones (HMZ)

Considered recent leading practice as applied in the Clarion Clipperton Zone

Only enough information for a regional “level 1” classification. Planned exploration work over the next five years should allow more detailed local classifications (so-called level 2 and 3).

Key data used:

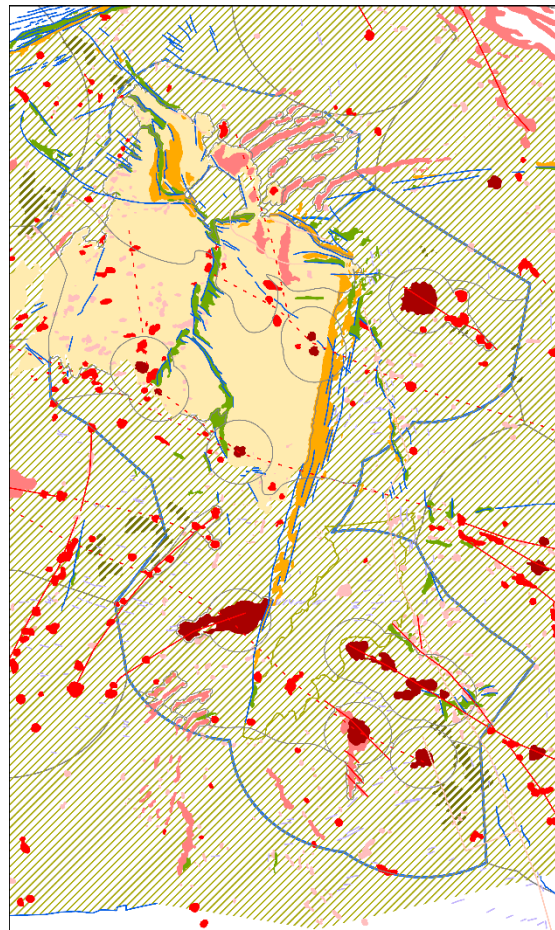
1. classic seabed geomorphological interpretation and
2. net organic carbon export model to frame the classification.

A key assumption in using both datasets is that they materially influence biodiversity and makeup at the scale of the management zones

Tested both interpretation and model against alternative or complementary datasets.

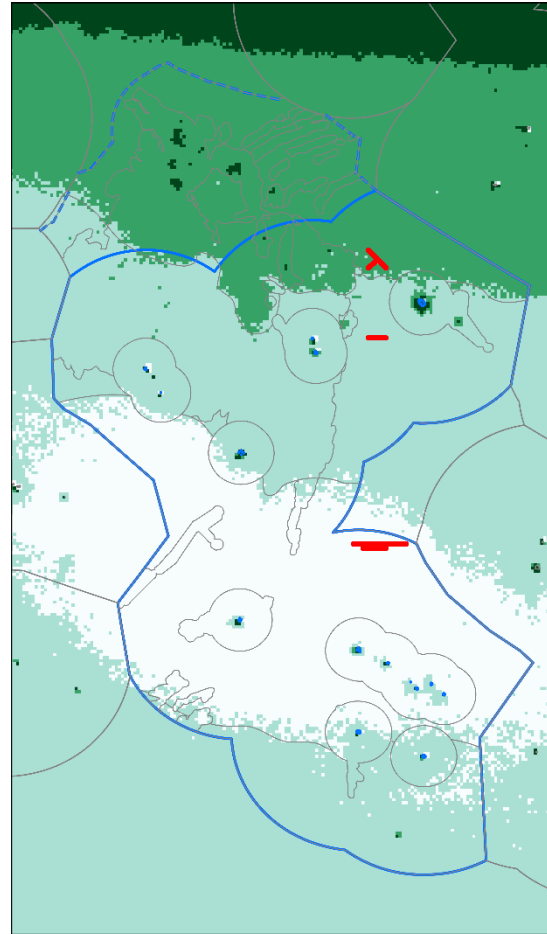


Specific Process for the HMZs



- chain_voic
- - - chain_voic_tent
- - - feature
- fault
- AB hill trace
- rise_voic
- knoll
- island
- seamount
- plateau
- trough
- rise_tect
- plateau
- low
- abyssal plain
- abyssal plain
- habitat_types_220414
- CI OCS (sub.)
- Cook Islands EEZ
- other EEZ

+



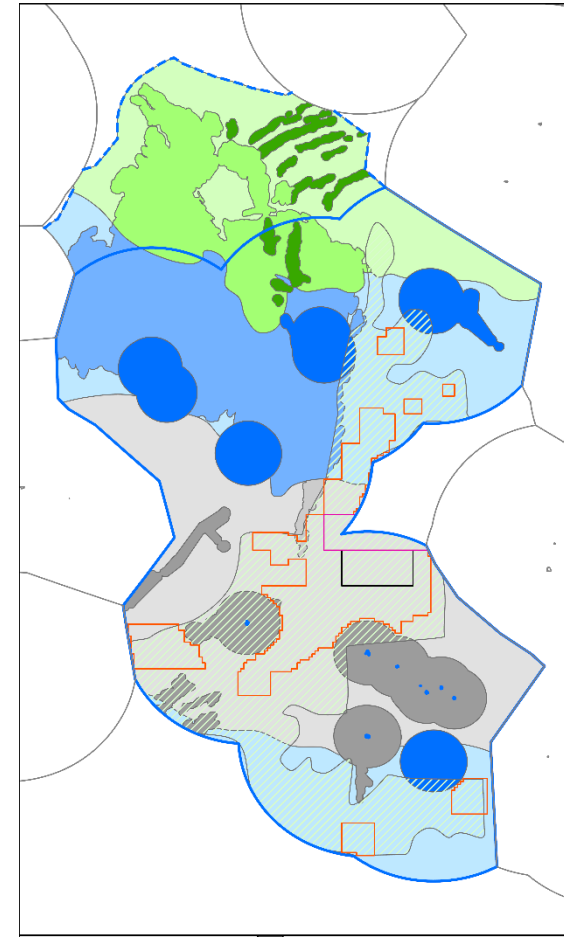
Lutz et al 2007 (g Corg/m²/yr)

- 0.046 - 0.67
- 0.671 - 1.355
- 1.356 - 1.81
- 1.811 - 220.05

adapted from McQuaid et al 2019
classification of the CCZ

— JICA Photo Lines

=



Habitat Management Zone

- 1A: very low NPP - abyssal plains
- 1B: very low NPP - volcanic chains
- 1C: very low NPP - plateaux
- 2A: low NPP - abyssal plains
- 2B: low NPP - volcanic chain
- 2C: low NPP - plateaux
- 3A: moderate NPP - abyssal plains
- 3B: moderate NPP - volcanic chains
- 3C: moderate NPP - plateaux

- Moana Minerals EL
- CIC EL
- CIICSR EL
- Kenex 2014 RSC Co Nodules



REMP: Regional Environmental Management Plan

The REMP will aim to ensure effective protection of the marine environment, maintain biodiversity, and safeguard ecosystem functions during any minerals harvesting or mining operations.

- Within the Cook Islands the REMP will need to take guidance from the requirements of Marae Moana and Environment Acts.
- The REMP will need to be reviewed periodically but will comprise two key components:
 1. **Area-based** through a network of set-aside zones. These are expected to be based on the HMZs but will also rely on placement of exploration and eventual mineral harvesting licenses as well as associated IRZs and PRZs.
 2. **Other management measures such as**
 - collection and analysis of regional-scale baseline data,
 - processes to predict and manage cumulative impacts of more than one mineral harvesting or mining operation or marine activity in the same region.
 - certain species distributions and habitats could be mapped and selected to receive special protections.
 - key breeding or migratory seasons could be identified in the region, to inform the introduction of temporal restrictions on overlapping operations.
 - currently there are no known underwater sites of historical or cultural significance, but these could also be recognized for protection.



REMP planned process - 2023

1. Workshop by invitation
2. Peer review
3. Public consultation
4. Finalisation of first version (NES-SBMA) by end 2023
5. Review in due course (and before issuance of first (if any) minerals harvesting licence)





Cumulative Impact Assessment - Introduction

Cumulative impacts are the impacts from multiple and repeated *pressures* on the environment.

- The negative aspect is that impacts on the marine environment may be worse than expected.
- The positive aspect is that modern modelling techniques allow us to better understand true nature of cumulative impacts. It allows us to address how exploitation of different ecosystems services (e.g. fishing and minerals harvesting) and projects (e.g. 1 vs 2 vs 3 seabed minerals operations) will relate.

CIA is a process that takes account of:

- Environmental setting
- Proposed pressures – size and uncertainty
- Interaction of the pressures - additive, synergistic, antagonistic (compensatory) and masking

The CIA process is inclusive and consultative. State of the art models based on over 12 years of development, can be provided and managed by the Australian CSIRO.

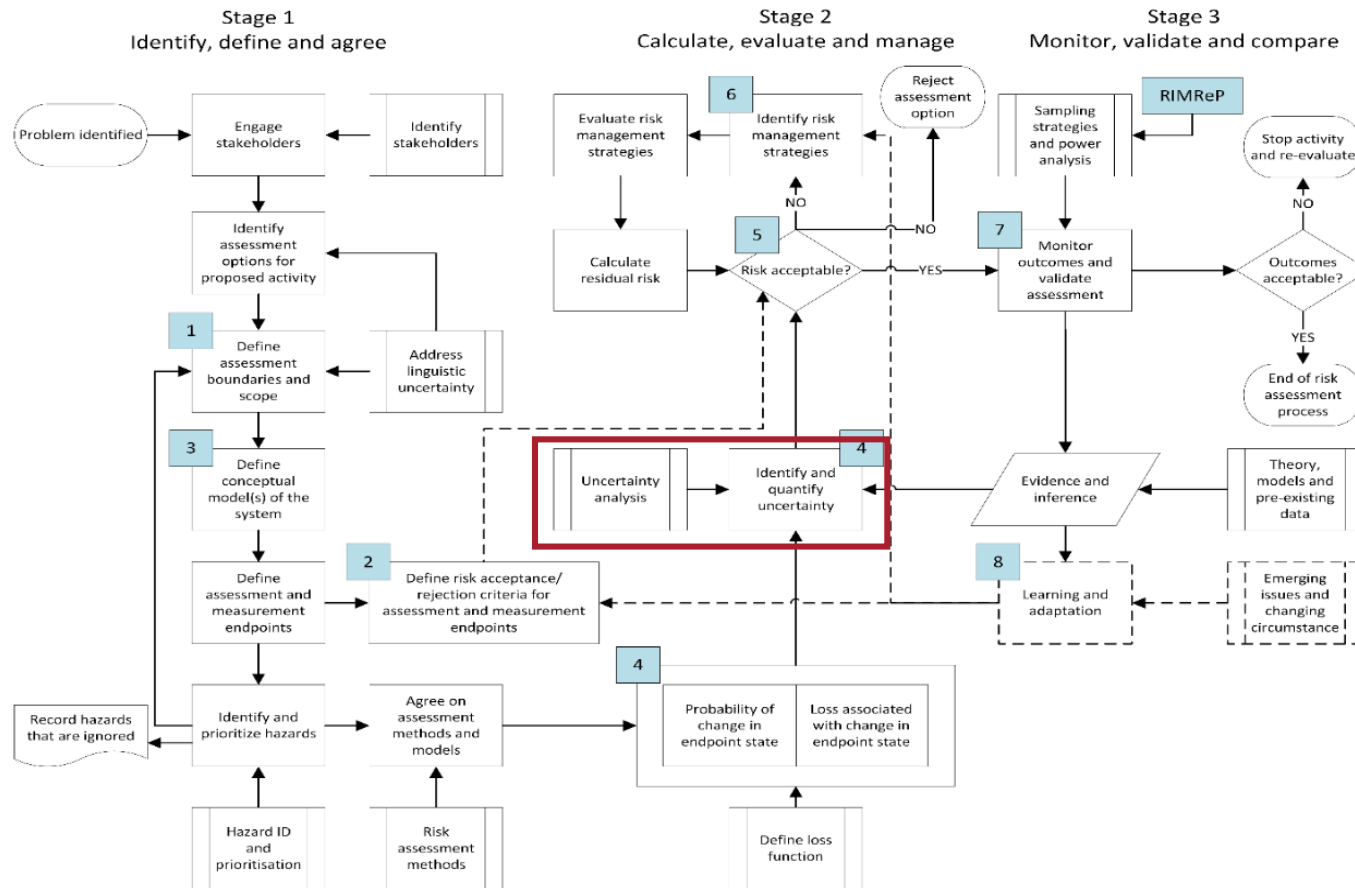
SBMA is still seeking funding for a year 1 pilot project. The objective is to make the process as independent as possible from the licence holders as possible (all sources of data will need to be included).



Cumulative Impact Assessment Model

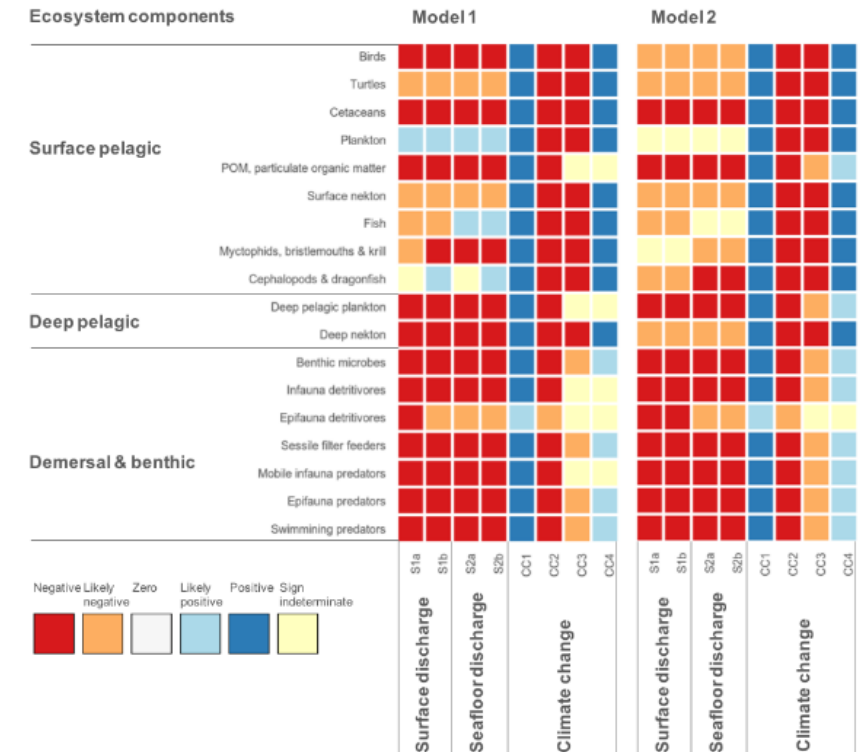


- Ready at EIA stage – can translate into EMMP stage



A good process to involve diverse technical stakeholders

Pelagic and non-hydrothermal sediment ecosystem: perturbation scenarios





Cumulative Impact Assessment pilot project plan

Lead consultants CSIRO

Coordination would be by SBMA and FEMA (Fisheries and Ecosystem Monitoring and Analysis/SPC).

Proposed scope :

- The Cook Islands seabed nodule deposit
- Overlying water column
- Overlapping ecosystem service users (not least commercial and artisanal fisheries)

Year 1: proof of concept via data compilation and preliminary modelling by CSIRO; workshop; refinement of modelling and reporting. Leading to a high level risk assessment that identifies key impact pathways and potential indicators for ecosystem impacts.

Follow-on: further work over the next 3 years involving: incorporation of exploration data from reporting by licence holders as well as any ongoing available fisheries and MSR data; remodelling; update workshop(s).

This may include the potential to identify thresholds and triggers and explicit identification of ecosystem level responses to different DSM operations.



rpSEP: Concept of a Research Permit for small environmental programs

- Understanding the marine environment of all of our seabed is a priority concern
- Exploration licence holders will only study their licence areas (this is all they are currently allowed to do)
- Opportunity to study other areas of the seabed are present while the licence holders are working – can we not leverage these into the entire seabed?
- A wide range of researchers, including Cook Island education and research institutions can make use of the licence holders expedition equipment. These could be very short expeditions, but with a common goal.
- By having small scale environment research operating under a single dedicated “umbrella” research permit held by SBMA we can streamline the process, allow more people to participate, and simplify the collection and collation of the environmental data
- This permit would be in effect for 12 months and a report would be submitted by SBMA to National Research Council at the end of the period

Under application



What rpSEP is/not...

it is:

- A permit to collect only marine environmental data.
- A mechanism to broaden research across our Marae Moana for more people.
- An opportunity to build a larger public reservoir of environmental data.



it is not:

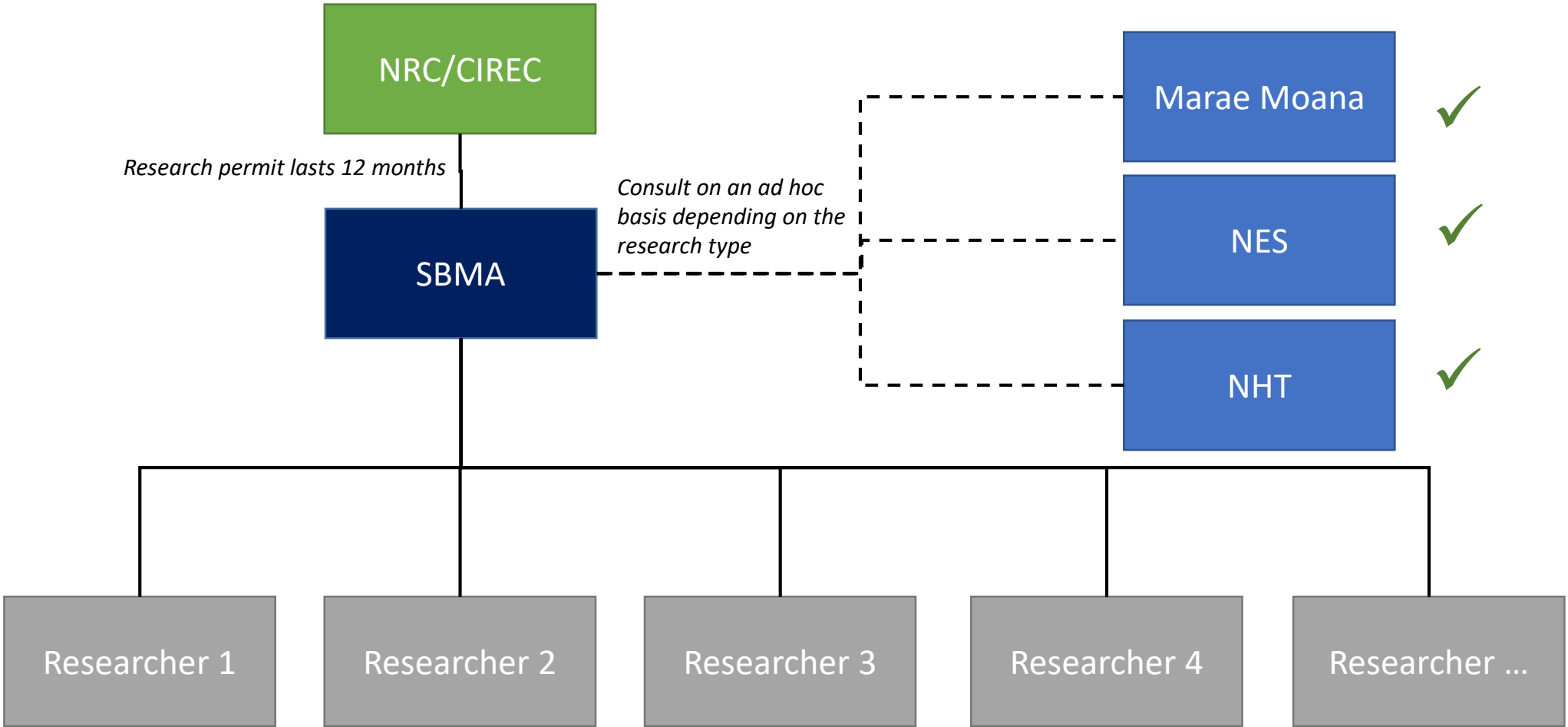
- An opportunity to allow parties to explore for marine minerals, fisheries etc;
- An opportunity to conduct social or other non-environmental studies.
- A replacement for the research permit process for longer seabed research expeditions.



Under application



Parties involved in the rpSEP



Under application



Examples of activities under the rpSEP

1. A **foreign university** sends a **scientific research team** and a container of specialist equipment to Rarotonga, then charters one of the locally based vessels normally being used by the licence holders (saving them over \$1M in logistics costs). They go to sea for 3-4 weeks to research a specific topic of concern e.g. the way the seabed is accumulating carbon.
2. A **licence holder** volunteers to survey parts of the seabed outside of their licence areas as they transit to and from site (i.e. every time they go to site they take a slightly different path, which takes 1-2 days), collecting seabed bathymetry and water column oceanographic data.
3. A licence holder offers several days of ship-time on their vessel as a competition to the local **schools** – the best proposal gets to send six **young scientists** to sea for about a week to collect samples of the seabed to search for fauna and to measure properties of the water column. The school team chooses where to go to do the research.
4. A **marine scientific researcher** is **transiting** during a regional survey (international waters, Tahiti, New Zealand for example) and might have some extra time if the weather is good. They offer to include 3 days in the Cook Islands and can use all of the equipment on their vessel to compare the scientific parameters of their study with what is found in our neighbours.

Under application



CSD 1 – Cook Islands Seabed Minerals and Environment Database

SBMA Information Management System (SMIMS) includes a register of titles (Register) and this database (CSD).



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Process to design the CSD

1. Types of data
 - Expedition Reports
 - EL Annual Report
 - Ad hoc datasets
2. Use of data predicted
 - helps inform format
 - Environmental and legacy data into public domain
3. Allocation of data repositories
 - Cloud based for capture/access
 - International repositories and templates for copies of key datasets

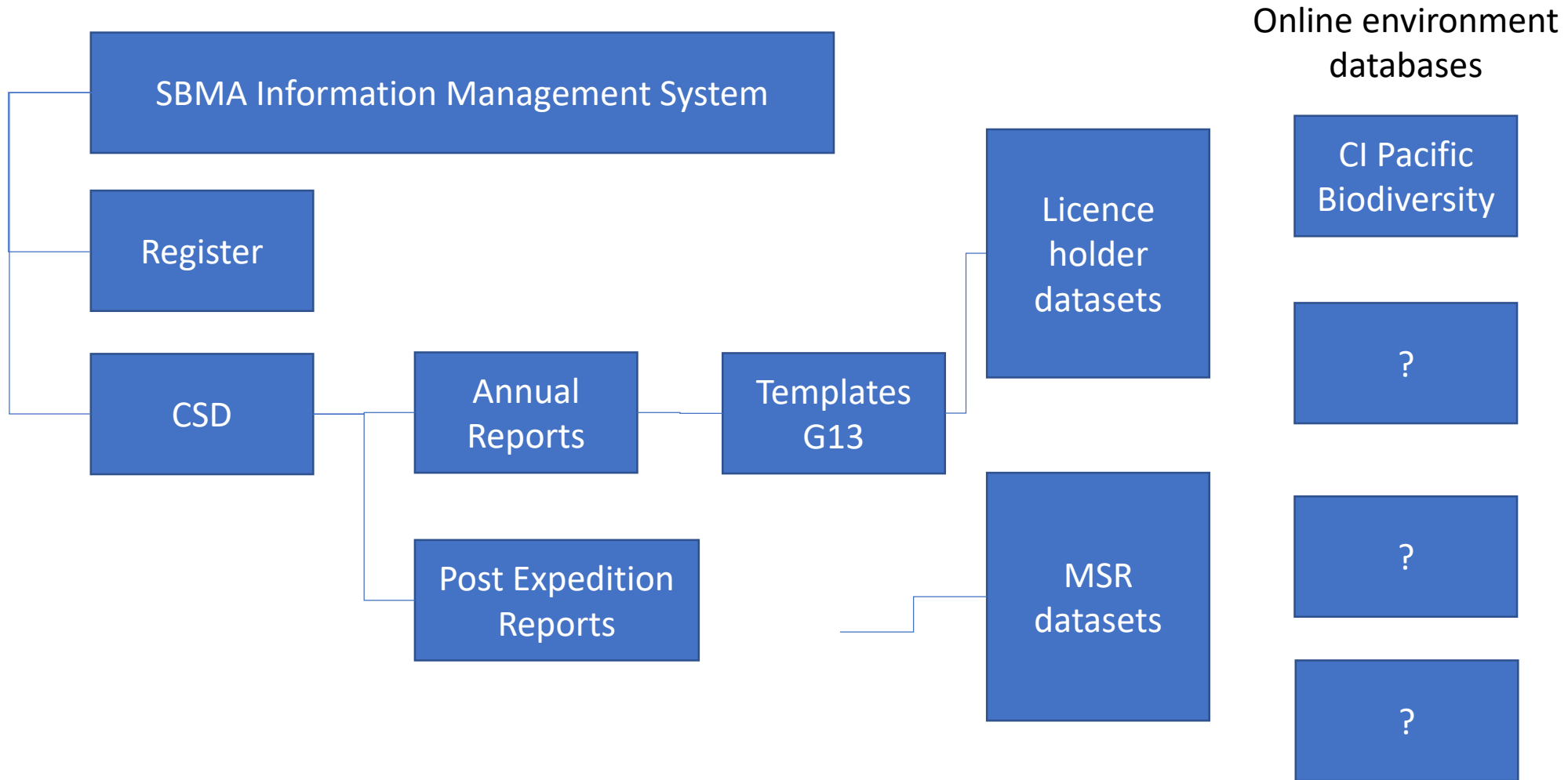


View **full licence** document for Moana Minerals Limited [here](#)

- **Company Name:** Moana Minerals Limited
- **Registered address:** Clark's building, Parekura Place, Avarua, Rarotonga
- **Total blocks licenced:** 288
- **Total licenced area:** 23,630 km²
- Application summary - [English](#) or [Maori](#)
- [Non-Technical Summary](#)
- [Environmental Management Programme](#)
- [Local engagement, training and business development plan](#)



Database elements

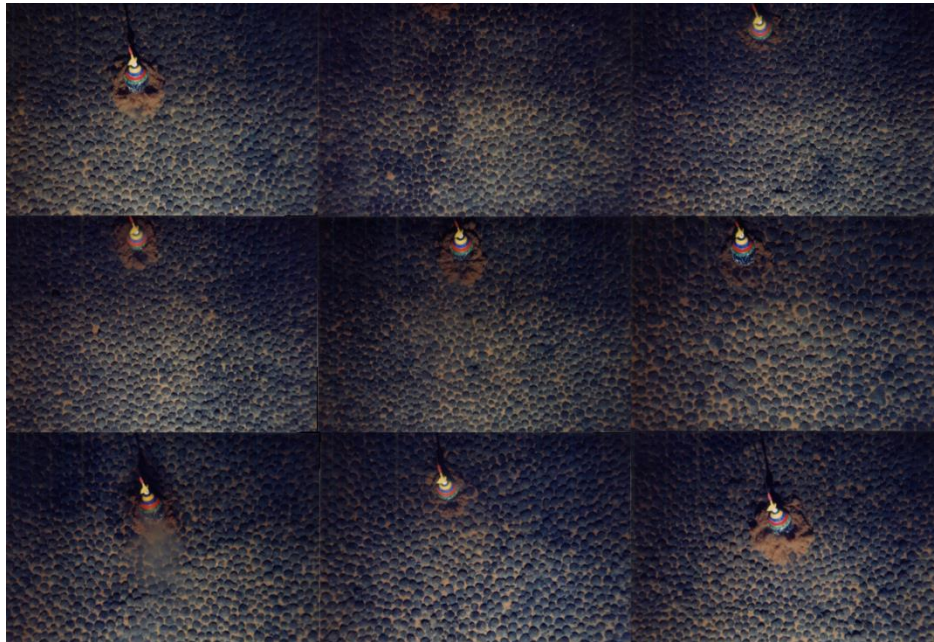




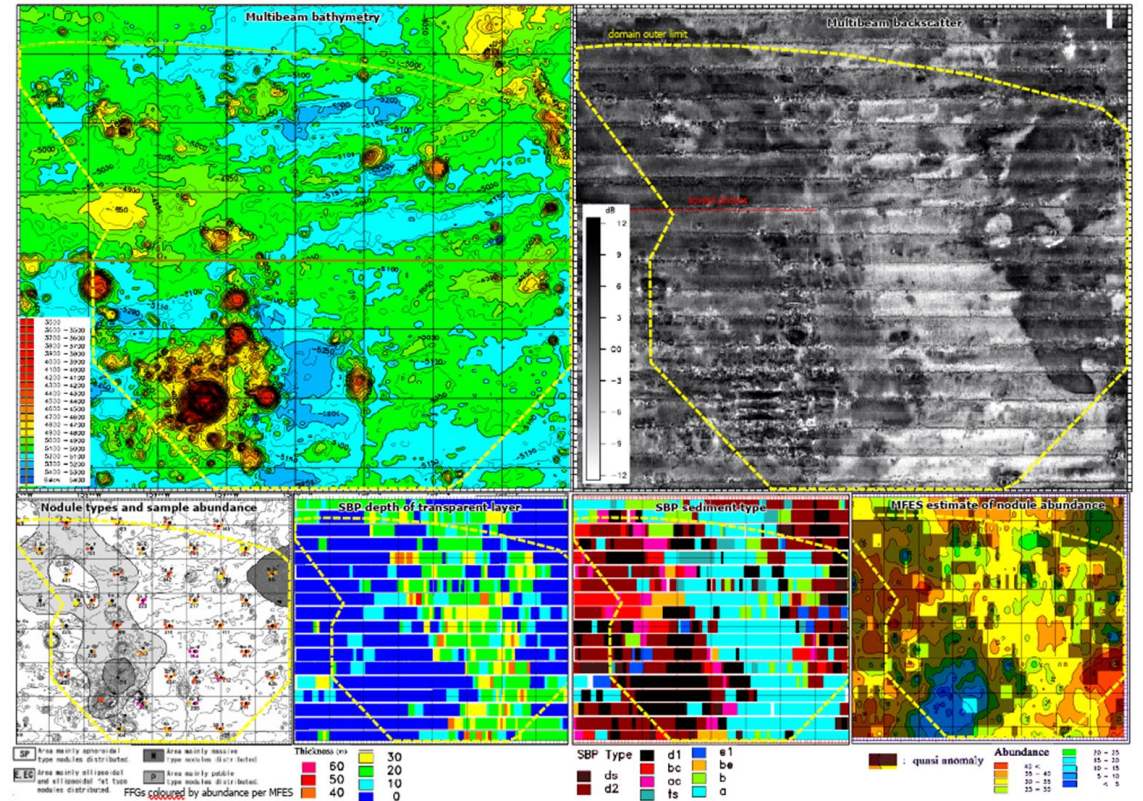
CSD 2

Way forward

- Q1 2023 complete design and commence population with legacy data
- Q2 2023 release of 2022 exploration results
- Q2 2024 release of 2023 exploration results



Legacy seabed images from 7, 10 , 16° south

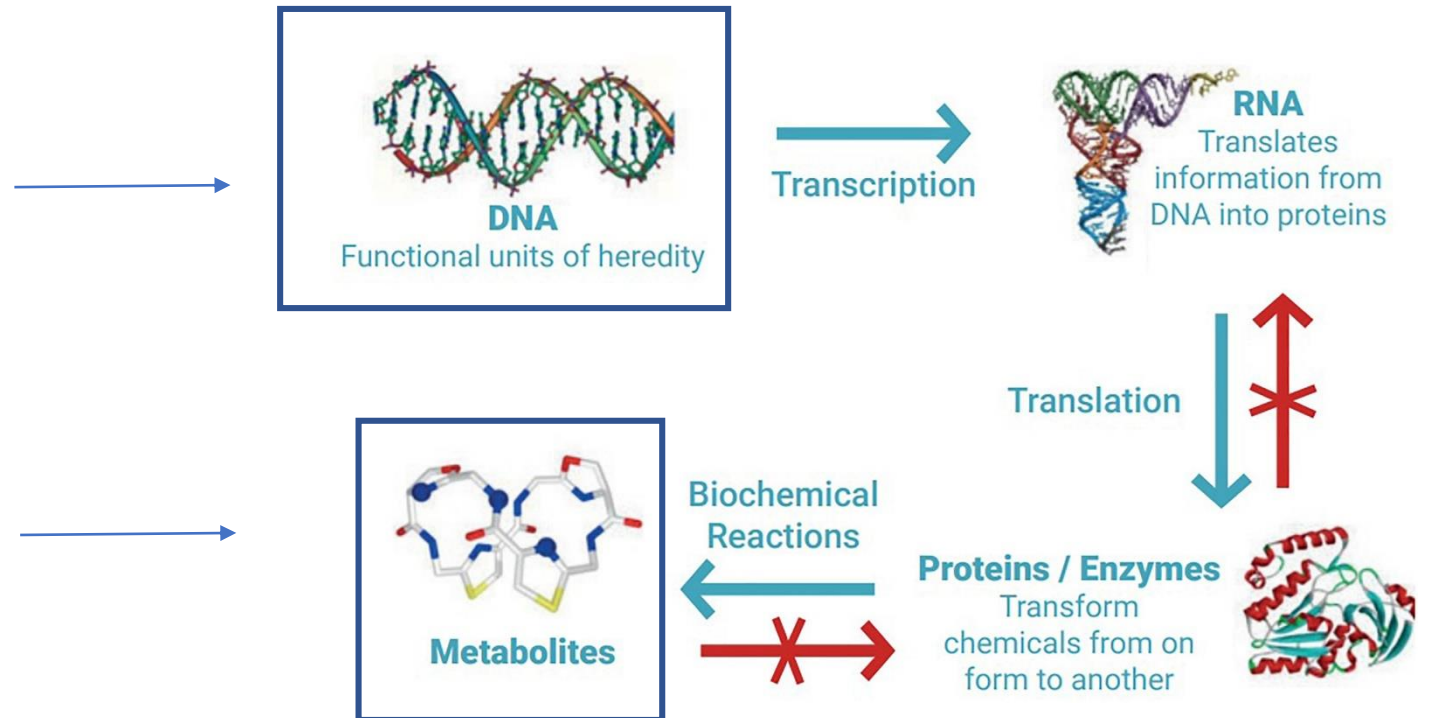


Legacy multibeam from 16-159 (Central area)



The Cook Islands should better understand its marine genetic resources

- Marine genetic resources (MGR) refer to genetic material of marine organisms, which have an actual or potential value for humanity - Rabone et al
- Can also include
 - any naturally occurring biochemical compound resulting from the genetic expression or metabolism of biological or genetic resources
 - For example, antibiotic medicines





What is the DEEPEND project?

- The DEEPEND project brings together several subject matter expert groups from the UK partnering them with institutions based in the western Pacific (SPC and SBMA).
- The project encompasses biodiversity in the western pacific including MGR
- DEEPEND aims to test existing samples as well as new ones from the western Pacific.
- In 2022 a pilot project and workshop were undertaken, hopefully this project can continue and be expanded in 2023 and onwards

 **NATURAL HISTORY MUSEUM**


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