

CIC Limited
Environmental Management Programme
for Exploration Licence EL1

- **Basic Objectives**
- **Tasks**
- **Environmental Setting**
- **At Sea Tools and Methods**

December 2022



Basic Objectives

- Conduct baseline studies
- Complete and obtain approval of an Environmental Impact Assessment (EIA) & an Environmental Management Plan (EMP)
- Minimize & mitigate environmental impacts of mineral harvesting
- Develop & implement a robust Monitoring Plan
- Specifically address the following from G. McCormack's publication, *"Cook Islands Seabed Minerals: A Precautionary Approach to Mining"*:
 - Apply the Precautionary Approach;
 - Compare the Cook Islands' environment with other deep ocean environments;
 - Minimize sediment plume dispersion and monitor carefully
 - Constrain water and sediments to their respective stratified layers;
 - Complete extensive regional mapping of species distributions throughout the licenced area; and
 - Establish representative Protected Areas where no impacts will occur

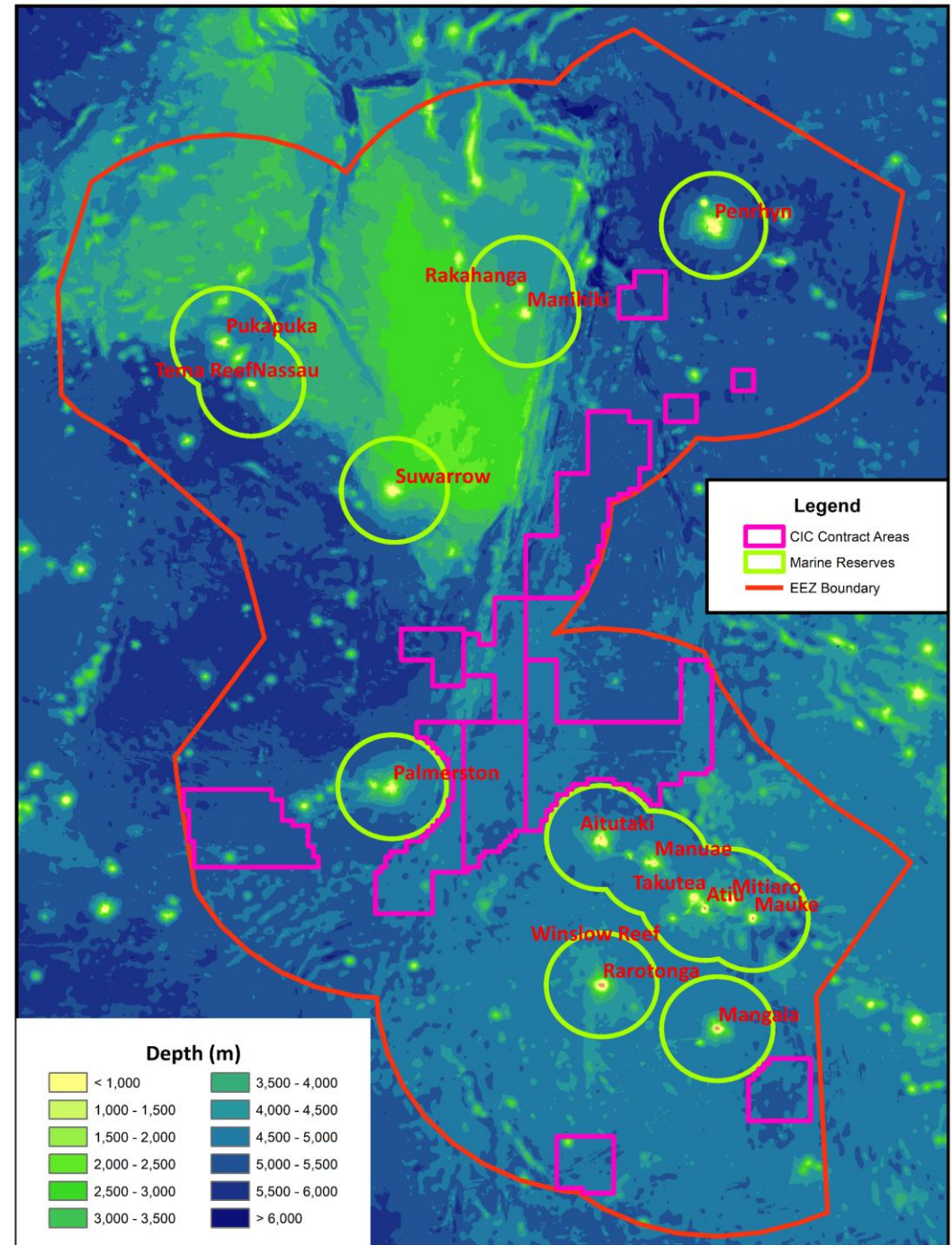
Tasks: 1

- **Project proposal description**
 - Exploration methods
 - Mineral harvesting methods
 - Transport and processing methods
 - Social and economic changes
- **Scoping**
 - Consultation with government
 - Outreach to Cook Islands citizens
 - Outreach to Non-Governmental organizations (NGOs)
- **Baseline Data Acquisition (time series)**
 - Physical conditions (e.g., air and water temperature, currents, winds, waves, ambient noise and light, seabed geomorphology)
 - Water chemistry (e.g., salinity, nutrients, trace metals)
 - Ecosystem functioning (e.g., nutrient flux to seafloor, respiration rates, microbial metabolism)
 - Species compositions and distributions (seabed, demersal, pelagic, surface)

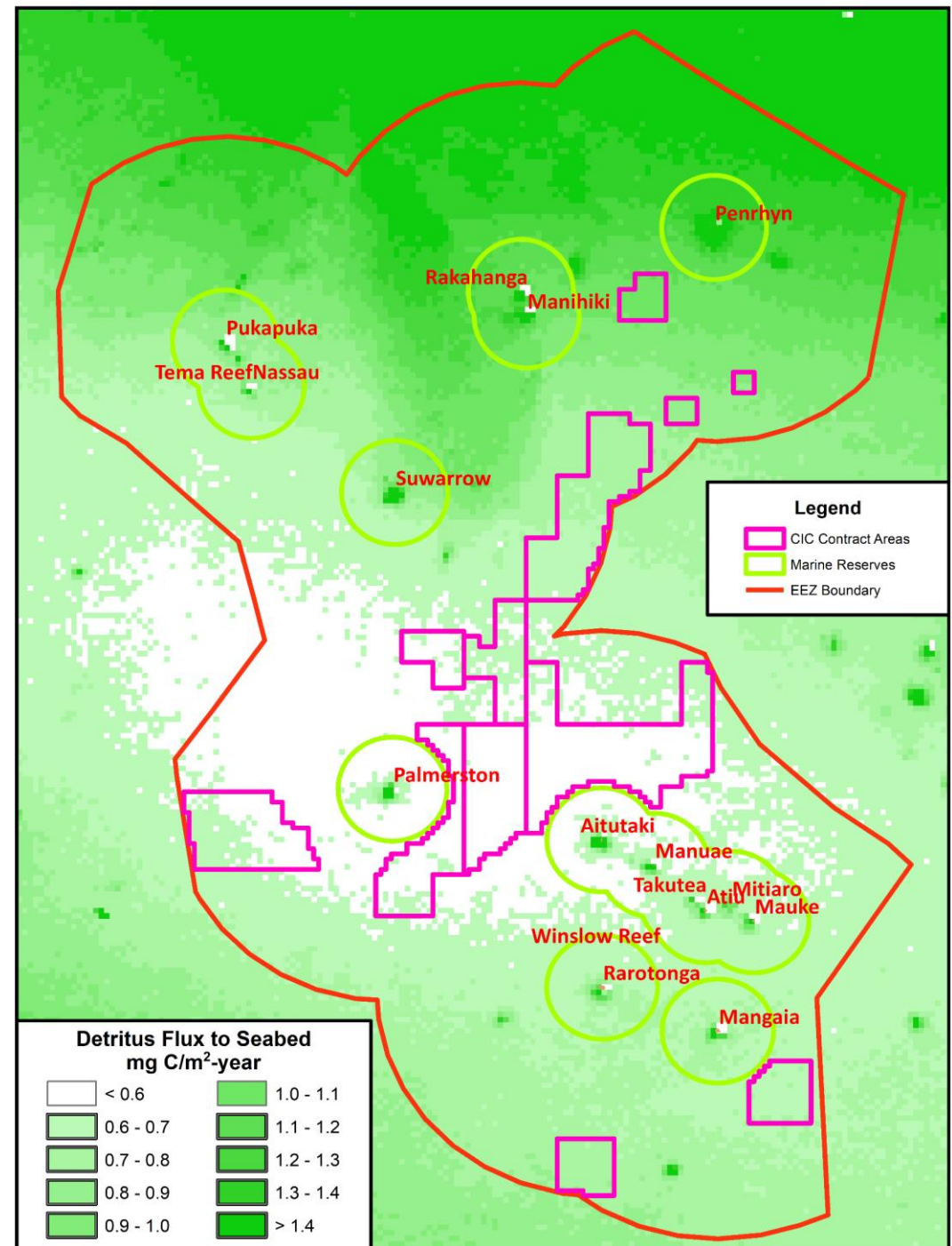
Tasks: 2

- **Data Synthesis and Reporting**
 - Survey reports
 - Environmental management plan (preservation site delineation)
 - Monitoring plan
 - Risk analysis
 - Environmental impact analysis
- **Monitoring Plan**
 - Direct impacts to seabed
 - Sediment dispersion impacts
 - Water column impacts
 - Habitat Recovery

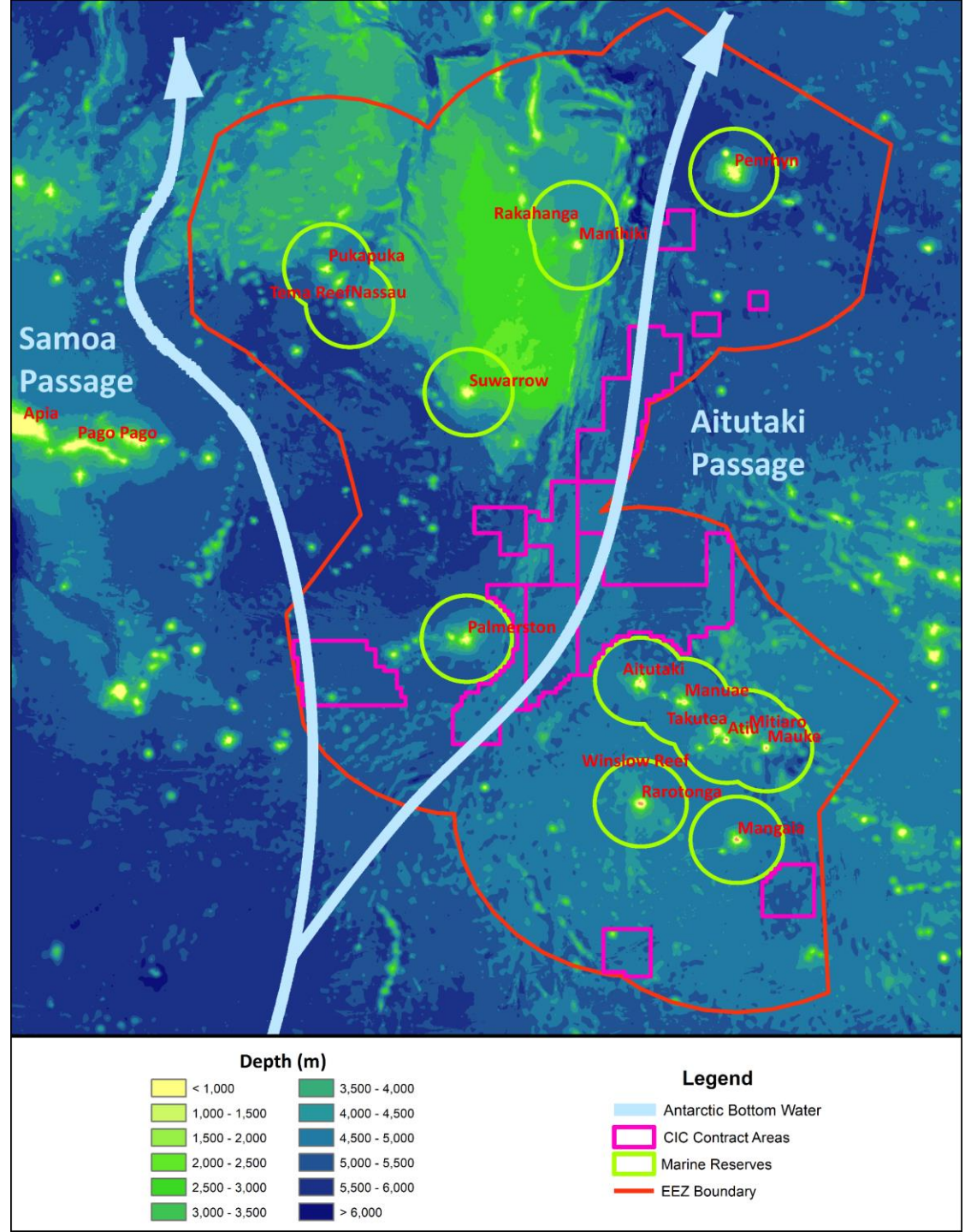
Geological Setting



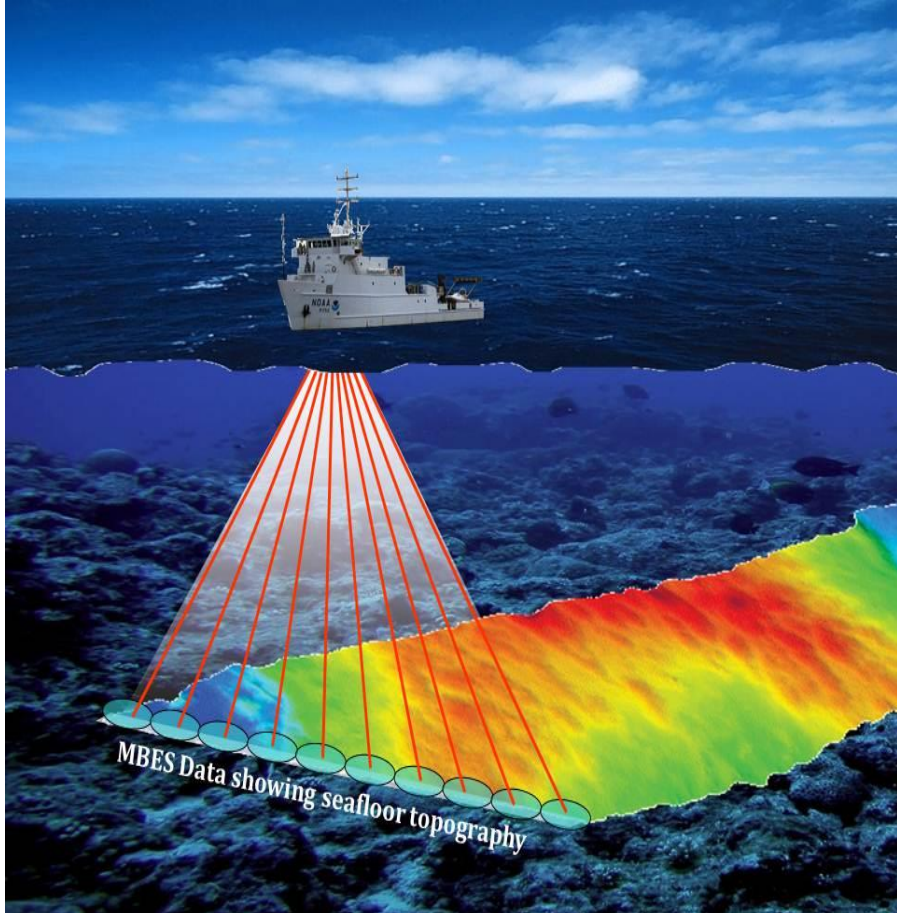
Oceanographic Setting



Aitutaki Passage



Tools: Seabed Surveying



Surface-mounted
(50-100m resolution)



Deep-towed
(1-10m resolution)



Autonomous Underwater Vehicle
(<1m resolution)

Tools: Seabed Sampling



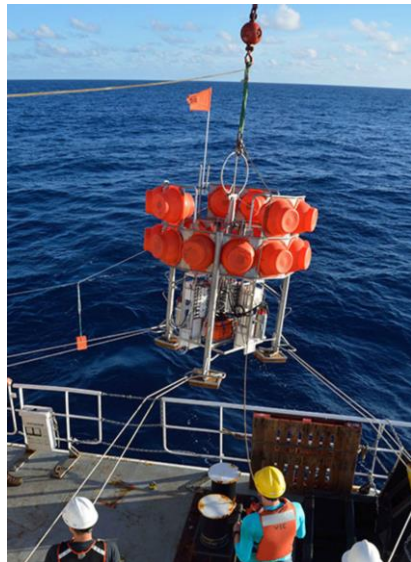
Box Corers



Mega/Multi Corers



Remotely Operated Vehicles



Respirometers



Baited traps



Baited Cameras

Tools: Water Column & Surface Surveying and Sampling

Moorings

Currents

Noise

Particle Flux



Surface Observations



Plankton Nets



Mini-Landers



Water Samplers & Sensors

Activities	March	April	May	June	July	Aug	Sept	Oct
Multi-Beam Bathy / SBP	AM (1/2 month)	AM	AM					
Box Coring (CBG 4+)		AM	AM					
Chain Dredge (<10K sm ²)		AM						
ROV Video Transects between box core locations		AM	AM					
ROV CPT / Megafauna Sampling	AM	AM	AM					
Box Coring (Prospecting)				SS	SS	SS	SS	SS
Benthic Mini-Lander Deployment				SS				
Benthic Mini-Lander Data Collection				SS	SS	SS	SS	SS
Microbial Sampling (HWU)	AM	AM	AM	SS	SS	SS	SS	SS
Macrofauna Analysis - Glover / Dahlgren			AM					
Megafauna Analysis - Jones			AM					
Bird and Mammal Observation / Recording	AM	AM	AM	SS	SS	SS	SS	SS
CTD (On-going)	AM	AM	AM	SS	SS	SS	SS	SS
Baited Camera Traps				SS	SS	SS	SS	SS
Respirometer				SS	SS	SS	SS	SS
Long Moorings								AM
Mega Corer / Multi Corer				SS	SS	SS	SS	SS