

This assessment is based on a now-expired version of the achievement standard and may not accurately reflect the content and practice of external assessments developed for 2024 onwards.

91935R



Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Level 1 Geography RAS 2023

91935 Demonstrate understanding of geographic decision-making in Aotearoa New Zealand or the Pacific

Credits: Five

PILOT ASSESSMENT

RESOURCE BOOKLET

Refer to this booklet to answer the questions for Geography RAS 91935.

Check that this booklet has pages 2–15 in the correct order and that none of these pages is blank.

YOU MAY KEEP THIS BOOKLET AT THE END OF THE EXAMINATION.

INSTRUCTIONS

Use these resources to complete the assessment for Geography RAS 91935.

Note Resources A–G (pages 6–14) are **the same as** the material supplied to you in class.

Pages 2–5 contain **new material**. Make sure you read this before beginning your answers.

RESOURCE 1: COVID-19 and the Cook Islands

COVID-19 had a significant effect on the Cook Islands. The country closed its borders to all travellers on March 26, 2020. The decision was made to protect the islands' population and prevent the spread of the virus. While this was extremely successful in terms of keeping the virus out of the country for many months, the economy experienced significant losses. The border closures meant that tourists were unable to travel to the islands.



Figure (i): Empty airports around the world reflected the significant decrease in tourist travel.

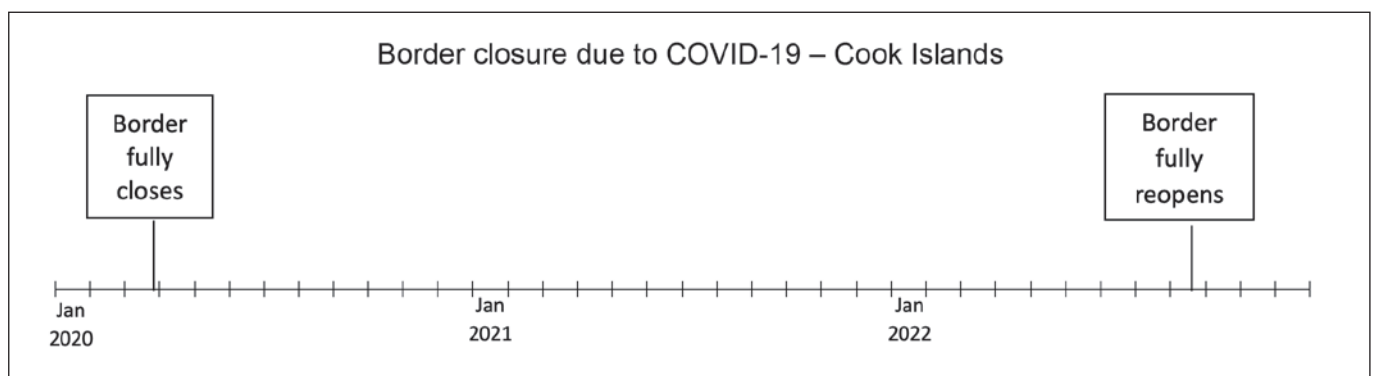


Figure (ii): Timeline of the Cook Islands' border closure.

Facts about the impact of COVID-19 on the Cook Islands' economy

- The Cook Islands' economy decreased by 32%, one of the worst affected by COVID-19 in the world.
- Government reserves (savings) were spent on keeping businesses from closing.
- The government also had to borrow \$228 million.
- National debt increased to 43% of what the country earns every year.
- 16% of the country's earnings will go to paying off the debt every year.

The economic impact of COVID-19 on the Cook Islands has led to some in the country, including the Prime Minister, Mark Brown, to want to make changes. These would include looking at other ways for the country to make money and not being so reliant on tourism. They say that if another pandemic was to sweep around the world, the Cook Islands needs a 'Plan B'.

RESOURCE 2: Deep-sea mining

Scattered around five kilometres deep, uncovered along the sea floor surrounding the Cook Islands are trillions of black, misshapen* nuggets that may just be the solution to making the country's economy sustainable in the future. The nuggets are called polymetallic nodules, and are an accumulation of nickel, cobalt, manganese, and other rare earth metals.



Figure (iii): A typical nugget, found on the sea floor of the Cook Islands.

The Pacific Deep Mining Company says the minerals such as cobalt and nickel are useful for the manufacturing of wind turbines, solar panels, and batteries for electric vehicles (EVs). There is said to be 28 kg of high-quality nodules per square metre of seabed around the Cook Islands, and because they are lying directly on top of the sea floor, they are easy to access.

“At this moment the world is trying to transition to a green economy, the minerals and the metals that are required to enable this, exist in the nodules that we have in our ocean,” Prime Minister Brown said. He stated further that the economic impacts will be game-changing. “This has the potential to match if not surpass the tourism industry [income] that our country currently earns.”

*misshapen distorted, twisted, out of shape



Figure (iv): Polymetallic nodules on the seabed – Cook Islands.

How deep-sea mining works

Enormous vacuum cleaners move across the sea floor, sucking up nodules (and the top 10 cm of seabed) and delivering the material through a pipe to a vessel on the surface. The metals are extracted from the nodules and then wastewater, sediment, and crushed-up heavy metals are returned to the sea.

Some people argue that the nodules are the key to saving the planet. The minerals are a key component of electric vehicle batteries. So much so that the nodules have been called a “battery in a rock”.

These minerals are in short supply and incredibly high demand, so mining for them off the Cook Islands’ coastline could:

- increase the number of EV batteries
- decrease the cost of EV batteries
- decrease the cost of EVs
- decrease the number of fossil-fuel-powered cars on the planet and therefore slow climate change
- earn a significant amount of money for the Cook Islands (in 2023, the price of cobalt was \$34,000 per tonne).

The Pacific Deep Mining Company is looking particularly at the deposits of polymetallic nodules surrounding the northern group of islands (namely Manihiki and Suvarrow), away from the tourist hotspots found in the southern islands of Rarotonga, Aitutaki, and Mangaia.

Figure (v): How nodules are mined from the seabed.

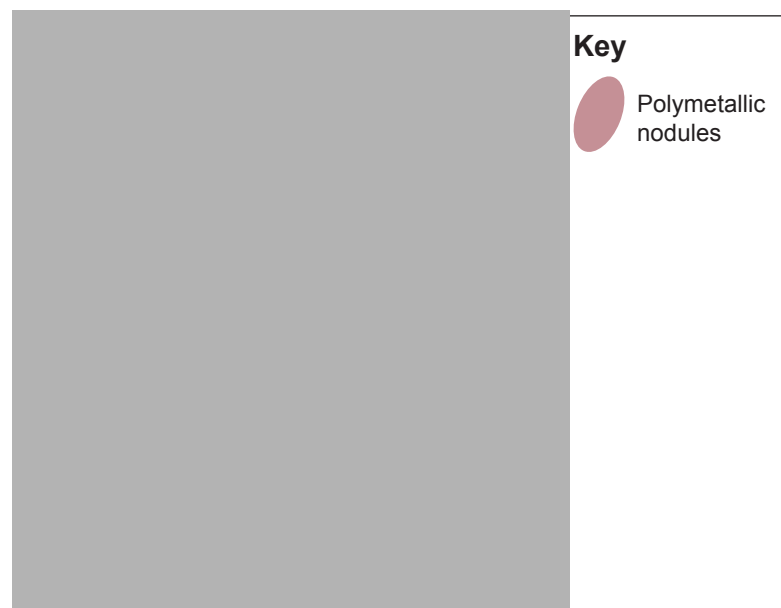


Figure (vi): Location of nodules that could be mined.

RESOURCE 3: Concerns

There are varying viewpoints on the proposal to mine the polymetallic nodules in Cook Islands waters. There are concerns that the deep-sea mining may have negative environmental impacts on the seabed and the ocean that surrounds the islands in general. If this happens, local Cook Islanders and the tourism industry may suffer the consequences.

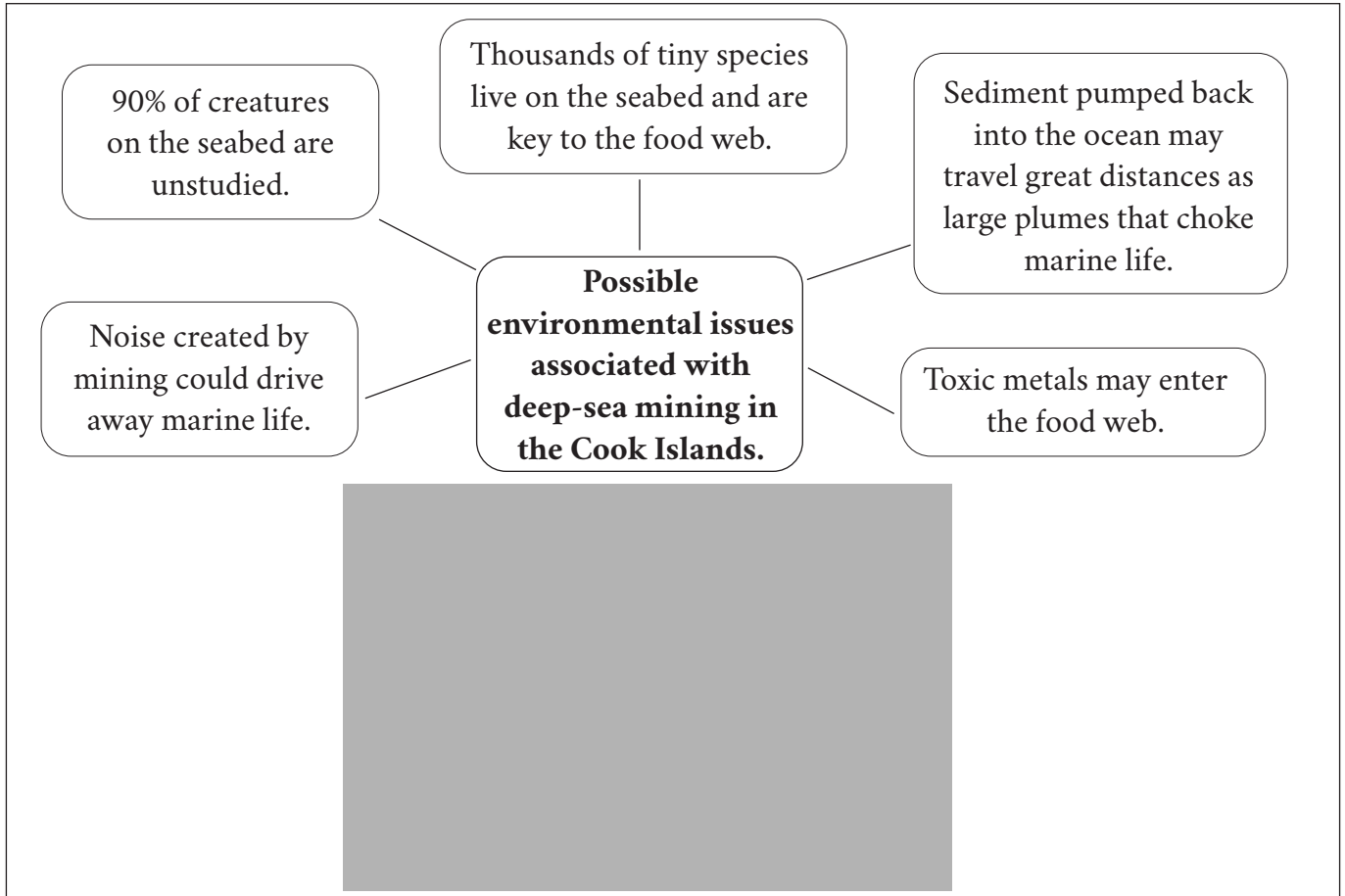


Figure (vii): The effects of mining on marine life.

In the outer islands, more than 90% of the indigenous Cook Island Māori who have been surveyed want the ocean protected from large-scale commercial activity. On islands where the average annual income is low, no one goes hungry. People catch fish, roast pigs, harvest seafood from the reef, and tend their own crops on the land. Surplus goes to neighbours, according to the cultural code of communities where everything – food, tasks, children – is shared.

“The life is not hard here,” a Cook Islands Māori in his 60s says beneath a mango tree on the island of Suvarrow. “You can’t go hungry here. So everything is always okay.” He catches fish, off the reef and farther out, the way his grandfather taught him to, and he grows vegetables and boils crabs and hunts pigs. He said he has everything he needs.

“It’s peaceful. It’s a paradise,” he said. “You go outside, around the world, and that’s why they’re fighting – it’s the minerals, the resources. Good thing we’re not fighting here yet.”



Figure (viii): Cook Islanders net fishing.

THE COOK ISLANDS

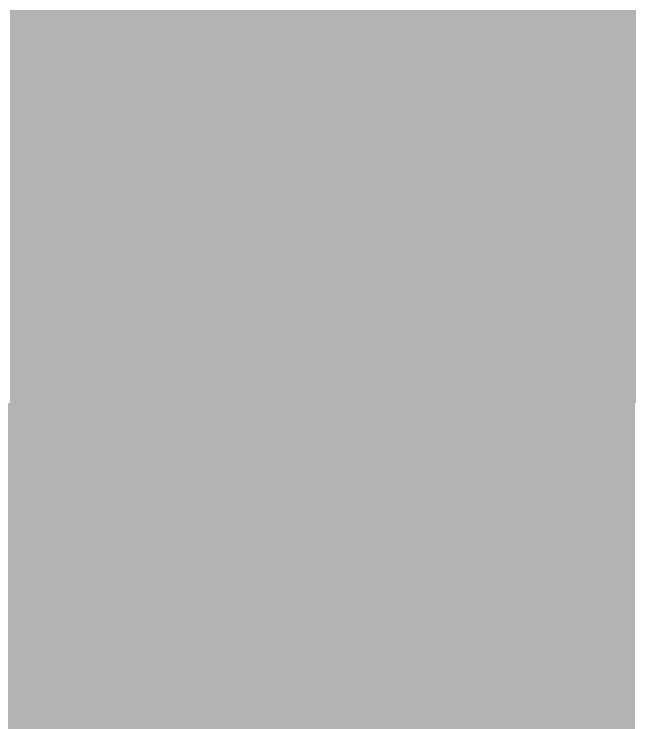
RESOURCE A: Location



Figure 1: World location of the Cook Islands.



Figure 2: Close-up map of the Cook Islands.



Figures 3 and 4: Images of Rarotonga, in the Cook Islands.

RESOURCE B: Legends/origin

The ocean is incredibly important to the people of the Cook Islands. The Cook Islands oral history tells of Rongo, who lived at the centre of all creation and was the most powerful god. The day after Rongo had created heaven and earth he looked down upon the Cook Islands and marvelled at their beauty. All day he continued to admire the deep carved valleys, the crystal blue lagoons, and the abundance of brightly coloured, tropical flowers.



Figure 5: Tangaroa, god of the oceans and seas.

*vaka canoe
 **ōire village

RESOURCE C: Geological formation

Figure 6: Atoll formation.

There are fifteen Cook Islands, all related to extinct volcanoes that have erupted in the volcanic hotspot highway of the south-central Pacific Ocean. Low islands include six of the more northern islands that are atolls, and four of the more southern that are uplifted coral islands. Rarotonga, the largest island of the group, is a mountainous volcanic high island with a reef and lagoon encircling it.



Figure 7: Muri Lagoon, Rarotonga.



Figure 8: Pukapuka Atoll, reef surrounding lagoon.

RESOURCE D: Climate

Figure 9: Climate chart for Avarua, capital of the Cook Islands.

The climate of the Cook Islands is tropical, with steady humidity levels and temperatures between 22°C and 30°C. The driest months of the year are between April and November, with December to March being the rainy season, when there's a greater chance of cloudy days and the occasional storm.

The Cook Islands are located in an area that is highly exposed to tropical cyclones with damaging winds, storm surge, and floods. On average, over \$8 million is lost per year due to tropical cyclones and other natural disasters.



Figure 10: The number of cyclones that were expected to occur in the Cook Islands in 2021–22. This was a fairly accurate reflection of what happened, as the 2021–22 cyclone season was an average one.

RESOURCE E: The tourism industry

Tourism is the backbone of the Cook Islands' economy. The tourism sector makes up an estimated 66% of its gross domestic product (GDP). Employment in tourism in 2016 was estimated at 2,386 jobs – about 34% of the country's total workforce.

In 2017, the average local spend per visitor during the entirety of their stay was \$1,263. When pre-paid spend and the local spend are combined, it is estimated that each visitor brought \$2,093 to the Cook Islands economy (or approximately \$237 per day). This figure is slightly lower than the \$2,138 average for 2015/16, and lower than the \$2,157 for the same quarter (April to June) 2016.

Expenditure Items	N=1324	
	Mean (NZ\$)	(% of spend)
Accommodation	60	42
Restaurant, cafes and bar	30	21
Shopping	11	8
Activities	9	6
Vehicle rental	9	6
Groceries	8	6
Domestic flights	8	6
Cruising	2	1
Other	2	1
Internet cost	2	1
Petrol	2	1
Public transportation	1	1
Total Expenditure	143	100

Figure 11: Average visitor expenditure in the Cook Islands (per person per day), 2017.



Figure 12: Diving is a popular tourist activity.



Figure 13: Punanga Nui market in Avarua, Rarotonga's main town.

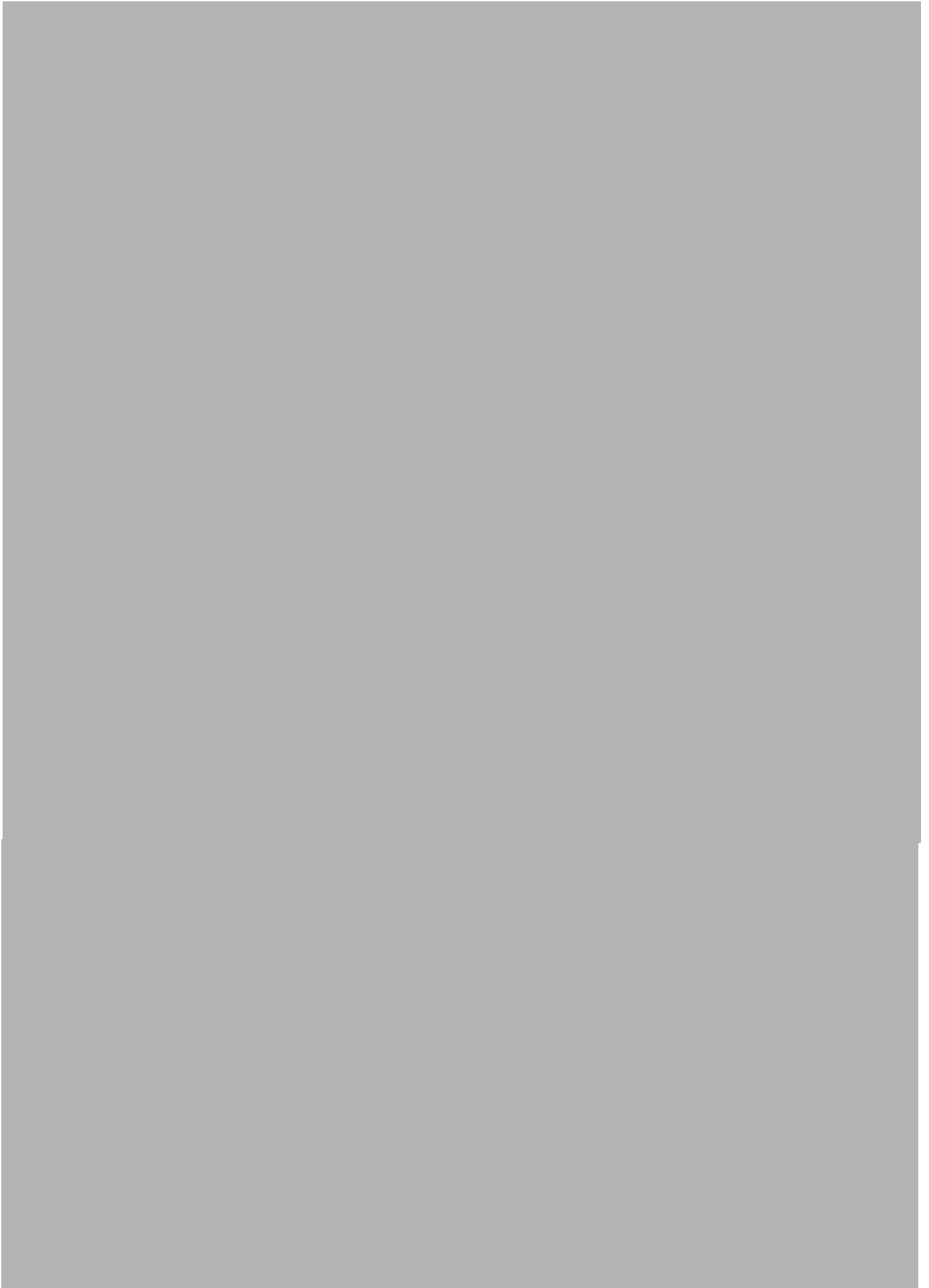


Figure 14: The percentage of visitors taking part in activities in the Cook Islands.

RESOURCE F: Importance of the ocean

Cook Islands: Life under the lagoon



Figure 15: Marine reserves are improving snorkelling in the Cook Islands.

Jim Eagles is surprised to find so many brightly coloured fish as he dives in one of the Cook Islands' new marine reserves with Nga, an experienced diver.

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<p>[Redacted text]</p>	<p>[Redacted text]</p> <p>*The ra'ui system is the traditional method of conservation and preservation of any or all resources whether on land, sea, or air. This ancient methodology of the ra'ui ensures the sustainability of fish stock or any resource that is disappearing or in low supply.</p> <p>**mana tiaki refers to the Cook Islands' tradition of guardianship and protection of resources for future generations.</p>
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RESOURCE G: Tourism challenges

Cook Islanders considering how much tourism is too much

May 2021

After a year of zero visitors in 2020, the Cook Islands is now pondering just how many visitors it actually wants to return.

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Figure 16: Muri Beach and Avana Harbour.

Acknowledgements

Material from the following sources has been adapted for use in this assessment:

Resource 1

Figure (i): <https://www.japantimes.co.jp/news/2020/03/13/business/ana-jal-expand-flight-cuts-coronavirus-hits-travel-demand/>

Text: <https://www.forumsec.org/2022/04/06/remarks-pm-of-cook-islands-hon-mark-brown-at-the-pacific-debt-conference/>

Resource 2

Figure (iii): https://cdn6.nzgeo.com/2022/02/174_Cook_Islands_Header2-1300x975.jpg

Figure (iv): <https://eos.org/features/the-2-year-countdown-to-deep-sea-mining>

Text: <https://time.com/6094560/deep-sea-mining-environmental-costs-benefits/>

<https://www.newshub.co.nz/home/world/2022/10/cook-islands-looking-to-explore-seabed-mining-in-efforts-to-restore-economy-after-covid-19-carnage.html>

Figure (v): https://cdn5.nzgeo.com/2022/02/174_Cook_Islands_09-344x1300.jpg

Figure (vi): <https://www.worldatlas.com/maps/cook-islands>

Resource 3

Figure (vii): https://www.pewtrusts.org/-/media/post-launch-images/2021/02/seabed_mining_panel1_650.jpg

Figure (viii): https://commons.wikimedia.org/wiki/File:Net_fishing_on_Aitutaki_Island,_Cook_Islands_-_journal.pbio.1001387.g002.png

Text: <https://www.nzgeo.com/stories/minerals-in-the-deep/>

Resource A

Figures 1 and 2: <https://www.worldatlas.com/maps/cook-islands>

Figure 3: <https://travellersworldwide.com/best-time-to-visit-the-cook-islands>

Figure 4: <https://depositphotos.com/146081415/stock-photo-tropical-rarotonga-with-palm-trees.html>

Resource B

Hopkins, S. (2010). *Legends of the Cook Islands*. (B. Potter, Illus.). Puffin Books.

Resource C

Figure 6: https://nmspapahanaumokuakea.blob.core.windows.net/papahanaumokuakea-prod/media/archive/monument_features/images/atoll_formation.jpg

Text: https://en.wikipedia.org/wiki/Geology_of_the_Cook_Islands

Figure 7: <https://www.discovercookislands.com/about-the-cooks/rarotonga/>

Figure 8: https://commons.wikimedia.org/wiki/File:Pukapuka_Aerial_efs_1280.jpg

Resource D

Figure 9: <https://en.climate-data.org/oceania/cook-islands/avarua/avarua-3314>

Text: https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/15815-WB_Cook%20Islands%20Country%20Profile-WEB_4.pdf

Figure 10: <https://niwa.co.nz/climate/southwest-pacific-tropical-cyclone-outlook/southwest-pacific-tropical-cyclone-outlook-october-2021>

Resource E

Text: <https://www.pacificpsdi.org/assets/Uploads/PSDI-TourismSnapshot-COO.pdf>

Figures 11, 14 and text: www.aut.ac.nz/__data/assets/pdf_file/0008/760562/Cook-Islands-Visitor-Survey-Results_Apr-Jun_2017_NZTRI-Qtrly-Report_0.pdf

Figure 12: <https://www.travelonline.com/cook-islands/diving>

Figure 13: https://www.tripadvisor.co.nz/Attraction_Review-g294330-d309980-Reviews-Punanga_Nui-Avarua_Rarotonga_Southern_Cook_Islands.html

Resource F

Text and Figure 15: <https://www.nzherald.co.nz/travel/cook-islands-life-under-the-lagoon/GYSTHOC7CZZDYUCCC2CR46I6HQ/>

Text: <https://www.mmr.gov.ck/raui-marine-protected-areas/>

Resource G

Text: <https://www.rnz.co.nz/international/pacific-news/443141/cook-islanders-considering-how-much-tourism-is-too-much>

Figure 16: <https://edition.cnn.com/2019/03/05/asia/cook-islands-name-intl/index.html>

