Ministry of Marine Resources
TU'ANGA O TE PAE MOANA
COOK ISLANDS

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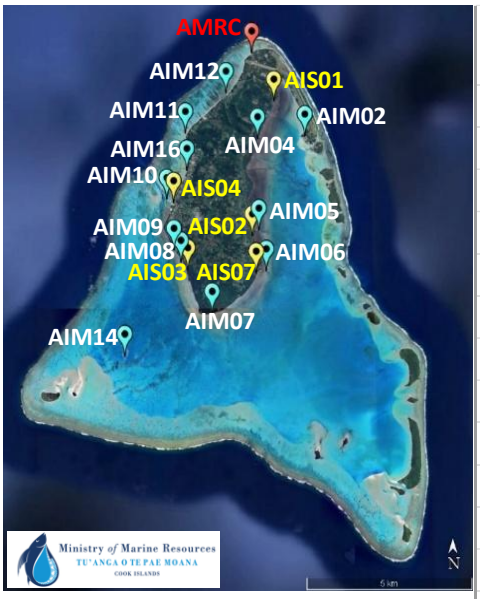
AITUTAKI WATER QUALITY REPORT
FEBRUARY 2026

SUMMARY

Water samples were collected on Wednesday 11th January. Weather was calm and sunny with a slight breeze, and tides were going low during sample collection. All twelve lagoon sites were accessible and sampled. Boodlea, Padina and Dictyota algae were observed at eight lagoon sites including Maina Nursery. All five streams were dry therefore none were sampled. Below is the summary table for Enterococci bacteria, total suspended solids and dissolved oxygen results and levels.

Lagoon Site	Site ID	Enterococci (MPN/100mL)	Total Suspended Solids (mg/L)	Dissolved Oxygen (%)
Ootu	AIM02	<1	4.9	101
Vaipeka	AIM04	<1	2.3	87
Vaipae Wharf	AIM05	<1	3.5	116
Tautu Wharf	AIM06	<1	2.8	81
Taravao	AIM07	<1	5.7	70
Vainamu	AIM08	<1	30.3	68
Vainamu Wharf	AIM09	<1	3.0	75
Arutanga Wharf	AIM10	<1	2.6	104
Rapae	AIM11	<1	0.7	91
Maunga Pu	AIM12	<1	2.1	66
Maina Nursery	AIM14	<1	0.9	106
Amuri Wharf	AIM16	<1	2.5	71



GRADING SCALE	Excellent	Very Good	Good	Poor	Very Poor	Extremely Poor

Lagoon:

- Enterococci bacteria showed excellent levels with a low result of <1 MPN/100mL at all twelve sites that indicated safe areas for swimming.
- Ten sites were below the total suspended solids recommended limit of 5.0 mg/L for healthy coral reefs that indicated clear waters and minimal threat to coral reefs. Taravao and Vainamu observed poor and extremely poor levels, respectively, exceeding the limit of 5.0 mg/L.
- Dissolved oxygen levels were above the recommended threshold of 80% showing good to excellent levels at seven sites. The remaining five sites observed poor levels below 80%.
- Temperature ranged from 27.1 degrees at Vaipeka to 31.8 degrees at Vaipae Wharf. Mean temperature was 28.9 degrees.
- pH ranged from 7.25 at Amuri Wharf to 7.95 at Vaipae Wharf. Mean pH was 7.67.

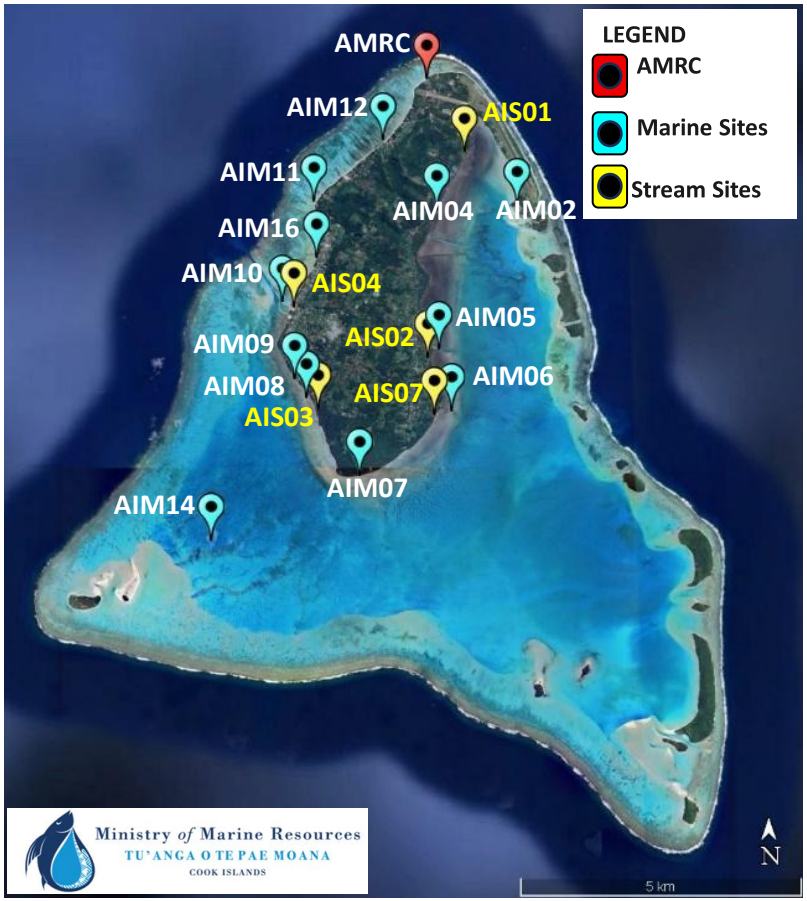
The monthly summary reports, rainfall data and lab study report can be found at the end of this report.

1. ENTEROCOCCI BACTERIAL COUNTS - AITUTAKI

Most Probable Number of Enterococci per 100 mL (MPN/100mL)

Lagoon Site	Site ID	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26
Ootu	AIM02	<1	<1	<1	ND	<1	<1
Vaipeka	AIM04	10	<1	20	ND	<1	<1
Vaipae Wharf	AIM05	20	<1	187	ND	146	<1
Tautu Wharf	AIM06	10	<1	<1	ND	158	<1
Taravao	AIM07	20	<1	10	ND	20	<1
Vainamu	AIM08	31	107	<1	ND	10	<1
Vainamu Wharf	AIM09	<1	10	30	ND	<1	<1
Arutanga Wharf	AIM10	10	<1	<1	ND	30	<1
Rapae	AIM11	<1	41	10	ND	10	<1
Maunga Pu	AIM12	<1	<1	<1	ND	20	<1
Maina Nursery	AIM14	NW	NW	NW	ND	NW	<1
Amuri Wharf	AIM16	10	41	41	ND	135	<1

Stream Site	Site ID	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26
Vaitiare	AIS01	NW	NW	NW	NW	NW	NW
Vaipae	AIS02	NW	NW	NW	NW	NW	NW
Pata	AIS03	NW	NW	NW	NW	NW	NW
Arutanga	AIS04	NW	NW	NW	NW	NW	NW
Tautu	AIS07	NW	56	NW	NW	228	NW

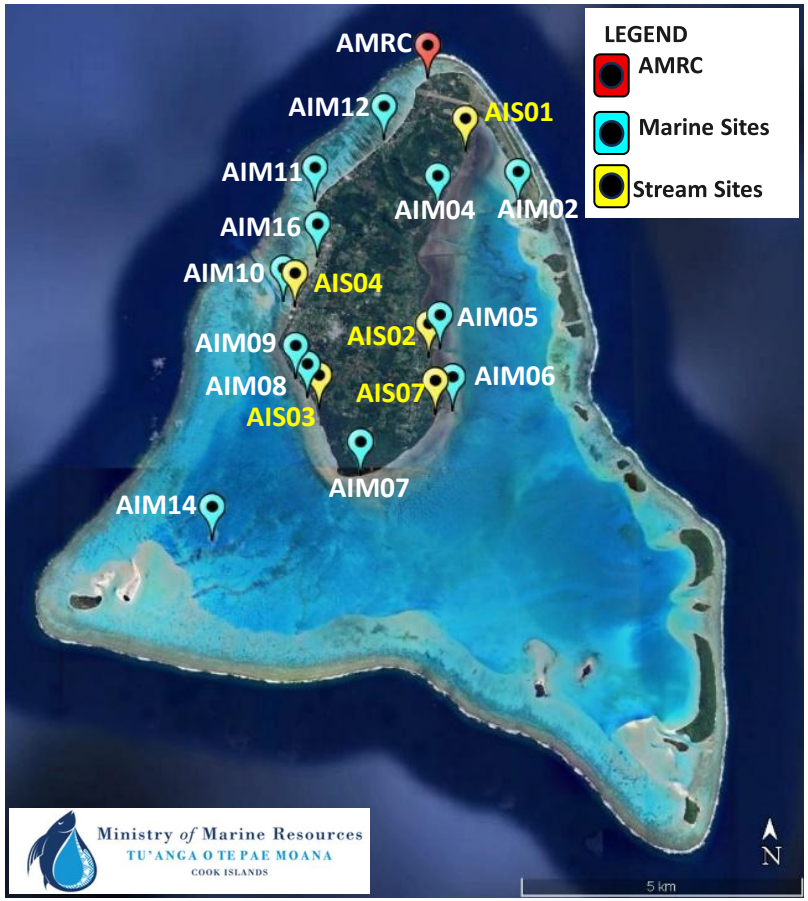


ENTEROCOCCI BACTERIA STANDARDS	< 41	41 ≥ 100	101 ≥ 200	201 ≥ 350	351 ≥ 500	> 500
	A	B	C	D	E	F
	Excellent	Very Good	Good	Poor	Very Poor	Extremely Poor
REFERENCE: WHO 2021 Guidelines on Recreational Water Quality for Coastal and Fresh Waters.						

2. TOTAL SUSPENDED SOLIDS - AITUTAKI - Milligrams per Litre (mg/L)

Lagoon Site	Site ID	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26
Ootu	AIM02	4.6	7.5	3.0	4.4	2.5	4.9
Vaipeka	AIM04	3.5	7.7	3.0	0.3	2.2	2.3
Vaipae Wharf	AIM05	2.0	13.6	4.0	5.2	8.8	3.5
Tautu Wharf	AIM06	13.0	4.0	2.0	5.4	6.8	2.8
Taravao	AIM07	2.9	5.4	5.0	2.4	10.9	5.7
Vainamu	AIM08	20.5	17.9	6.7	13.6	44.8	30.3
Vainamu Wharf	AIM09	4.6	9.5	13.2	2.2	1.8	3.0
Arutanga Wharf	AIM10	7.1	8.9	3.9	3.1	2.4	2.6
Rapae	AIM11	2.2	2.0	1.0	0.3	4.3	0.7
Maunga Pu	AIM12	1.3	0.3	4.8	1.4	3.2	2.1
Maina Nursery	AIM14	NW	NW	NW	0.3	NW	0.9
Amuri Wharf	AIM16	2.3	2.4	1.0	2.3	4.8	2.5

Stream Site	Site ID	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26
Vaitiare	AIS01	NW	NW	NW	NW	NW	NW
Vaipae	AIS02	NW	NW	NW	NW	NW	NW
Pata	AIS03	NW	NW	NW	NW	NW	NW
Arutanga	AIS04	NW	NW	NW	NW	NW	NW
Tautu	AIS07	NW	10.0	NW	NW	7.9	NW

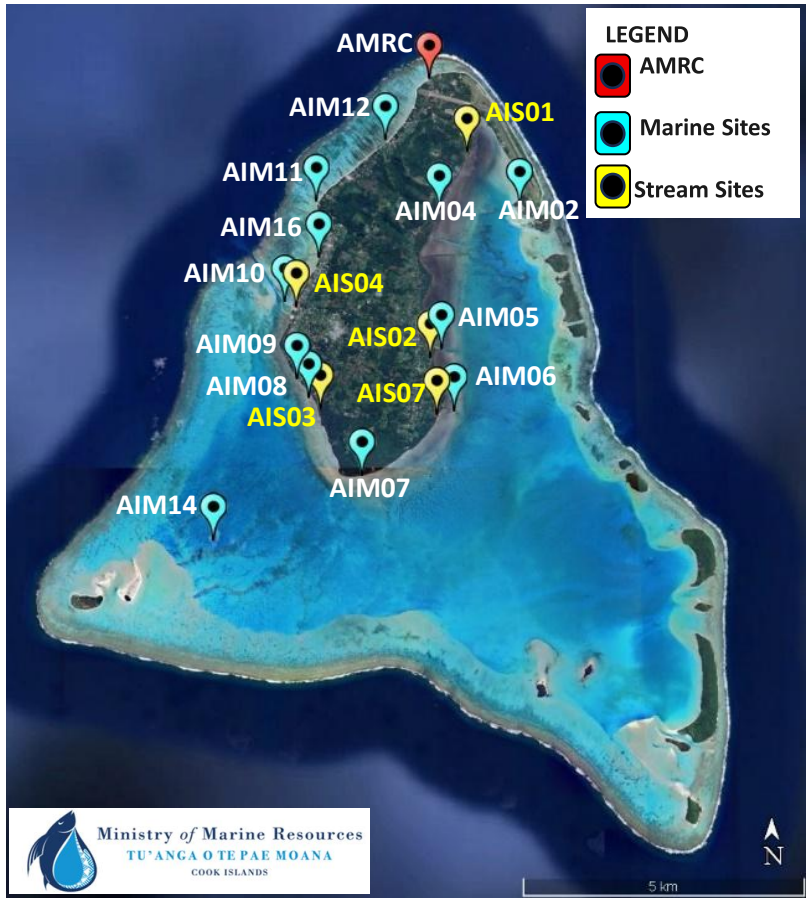


TOTAL SUSPENDED SOLIDS STANDARDS	< 1.0	1.0 ≥ 2.5	2.5 ≥ 5.0	5.0 ≥ 10	10 ≥ 20	> 20
	A	B	C	D	E	F
	Excellent	Very Good	Good	Poor	Very Poor	Extremely Poor
REFERENCE: Bell 1992, total suspended solids recommended limit is ≤5 mg/L for healthy coral reef.						

3. DISSOLVED OXYGEN - AITUTAKI - Percent (%)

Lagoon Site	Site ID	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26
Ootu	AIM02	77	110	87	99	104	101
Vaipeka	AIM04	111	117	112	114	105	87
Vaipae Wharf	AIM05	116	122	119	112	110	116
Tautu Wharf	AIM06	111	117	107	110	103	81
Taravao	AIM07	99	117	97	113	94	70
Vainamu	AIM08	86	87	79	100	88	68
Vainamu Wharf	AIM09	100	94	78	82	71	75
Arutanga Wharf	AIM10	109	106	104	81	102	104
Rapae	AIM11	80	84	88	95	100	91
Maunga Pu	AIM12	86	83	77	80	77	66
Maina Nursery	AIM14	NW	NW	NW	78	NW	106
Amuri Wharf	AIM16	92	87	73	73	89	71

Stream Site	Site ID	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26
Vaitiare	AIS01	NW	NW	NW	NW	NW	NW
Vaipae	AIS02	NW	NW	NW	NW	NW	NW
Pata	AIS03	NW	NW	NW	NW	NW	NW
Arutanga	AIS04	NW	NW	NW	NW	NW	NW
Tautu	AIS07	NW	15	NW	NW	26	NW

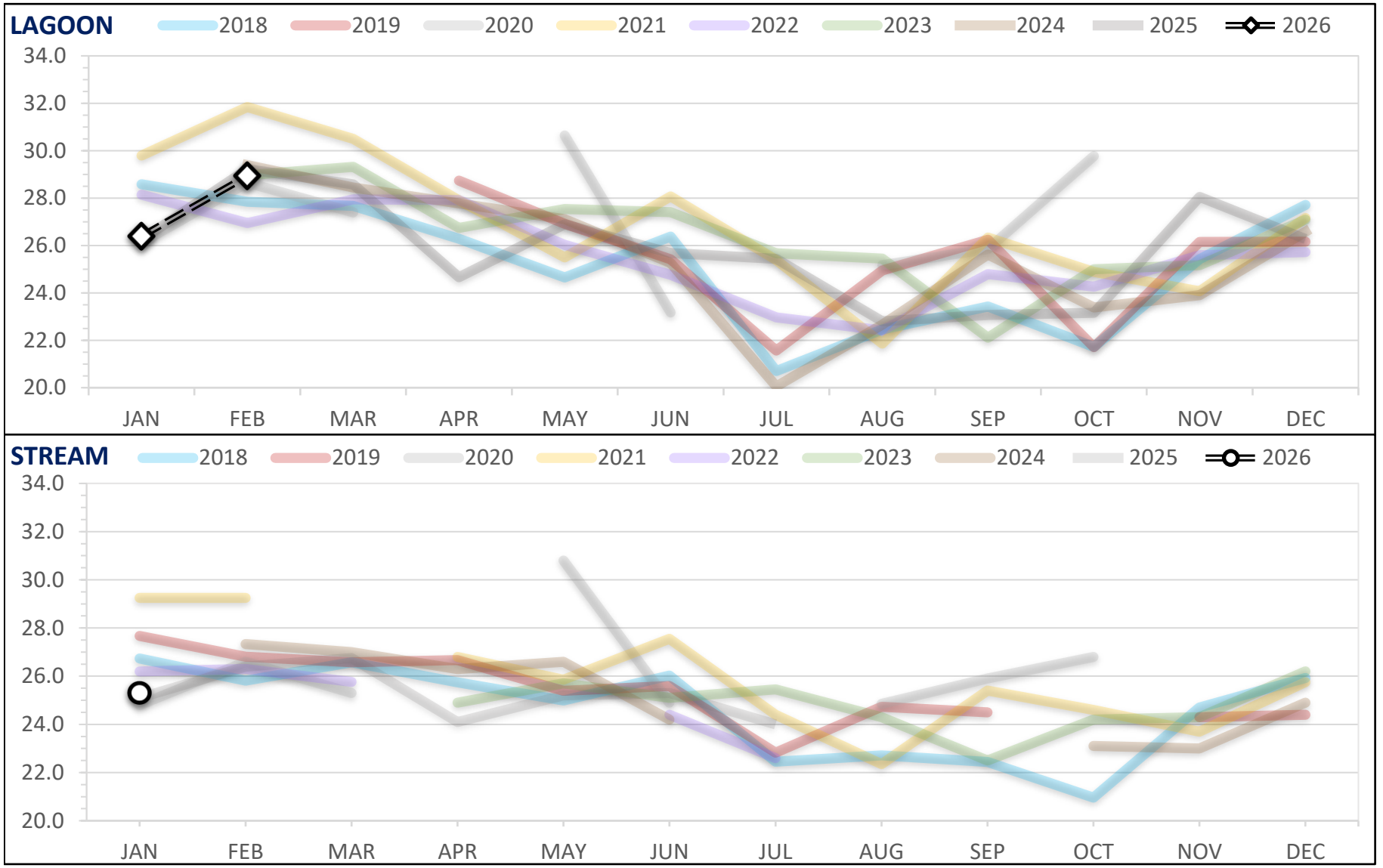


DISSOLVED OXYGEN STANDARDS	> 95	90 ≥ 95	80 ≥ 90	60 ≥ 80	40 ≥ 60	< 40
	A	B	C	D	E	F
	Excellent	Very Good	Good	Poor	Very Poor	Extremely Poor

REFERENCE: Department of Health, Clean Water Branch Hawaii 1994: Dissolved oxygen recommended limit is ≥75% saturation for oceanic waters, embayments, open coastal waters & estuaries; ≥80% saturation for streams.

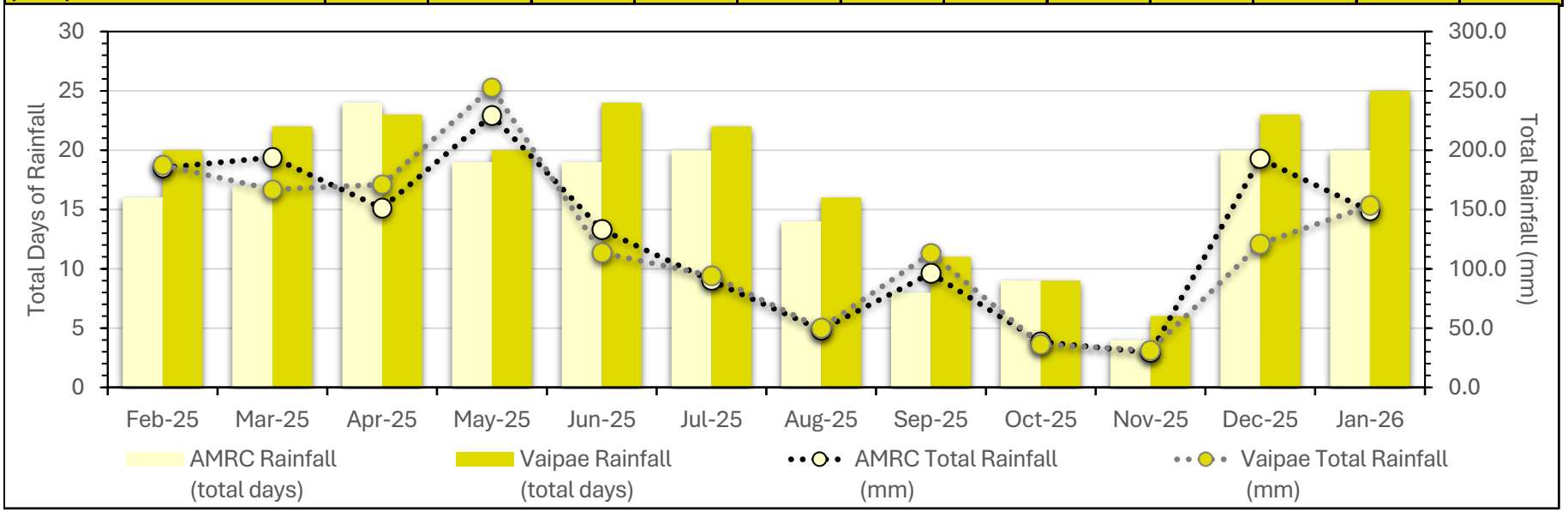
4. AVERAGE TEMPERATURE - AITUTAKI - Degrees Celcius (˚C)

2026	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lagoon	26.4	28.9										
Stream	25.3	ND										



5. AITUTAKI RAINFALL - AMRC & VAIPAE - Total Rainfall (mm) & Total Days of Rainfall

2025 - 2026	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26
AMRC Total Rainfall (mm)	185.2	193.8	151.0	229.4	132.9	89.9	48.6	96.2	38.4	29.4	192.8	148.8
AMRC Rainfall (total days)	*16*	*17*	*24*	*19*	*19*	*20*	*14*	*8*	*9*	*4*	*20*	*20*
AMRC Highest 1-Day (mm)	43.8	39.6	75.8	95.0	72.4	20.4	19.2	74.8	14.0	14.0	62.6	44.8
AMRC Highest 1-Day (date)	*19th*	*3rd*	*6th*	*24th*	*26th*	*11th*	*7th*	*18th*	*5th*	*30th*	*17th*	*26th*
Vaipae Total Rainfall (mm)	187.4	166.8	171.0	252.6	113.6	94.2	50.0	113.0	36.2	31.2	121.0	153.4
Vaipae Rainfall (total days)	*20*	*22*	*23*	*20*	*24*	*22*	*16*	*11*	*9*	*6*	*23*	*25*
Vaipae Highest 1-Day (mm)	44.4	33.0	68.4	100.2	52.0	20.0	19.0	89.0	14.4	14.4	34.2	40.2
Vaipae Highest 1-Day (date)	*19th*	*3rd*	*6th*	*24th*	*26th*	*11th*	*7th*	*18th*	*5th*	*30th*	*17th*	*26th*



Report Date: 13.02.2026		AITUTAKI LAB STUDY REPORT – FEBRUARY 2026			Lab Report No.: 02M5448 – 02M5459		
SAMPLE DESCRIPTION							
Date Samples Collected:	Name of Sample:	Collected By:	Submitted By:	Time of Receipt:	Physical Description:		Quantity Per Site Received:
Wednesday 11th February	Marine	MMR		10:05am	Clear		2.5L
Study No.	1	2	3	4	5	6	7
SITE ID / LAB ID	Enterococci (MPN/100ml)	Temperature (°C)	*Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	pH	Total Suspended Solids (mg/L)
MARINE							
AIM02 / 02M5448	<1	30.2	ND	101.4	7.17	7.81	4.9
AIM04 / 02M5449	<1	27.1	ND	86.7	6.18	7.64	2.3
AIM05 / 02M5450	<1	31.8	ND	116.3	7.65	7.95	3.5
AIM06 / 02M5451	<1	30.3	ND	81.3	5.52	7.86	2.8
AIM07 / 02M5452	<1	27.4	ND	69.7	4.99	7.46	5.7
AIM08 / 02M5453	<1	27.3	ND	67.6	4.91	7.43	30.3
AIM09 / 02M5454	<1	30.0	ND	74.9	5.15	7.37	3.0
AIM10 / 02M5455	<1	28.8	ND	104.1	7.23	7.92	2.6
AIM11 / 02M5456	<1	27.9	ND	91.2	6.55	7.71	0.7
AIM12 / 02M5457	<1	29.8	ND	66.0	4.60	7.72	2.1
AIM14 / 02M5458	<1	28.5	ND	105.5	7.37	7.92	0.9
AIM16 / 02M5459	<1	28.1	ND	70.5	5.04	7.25	2.5
Study Method	IDEXX Enterolert*	YSI Manual	YSI Manual	YSI Manual	YSI Manual	YSI Manual	MMR Lab Manual Water Quality Monitoring V5
Recommended Limit	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments

*Salinity data showed error readings that indicated sensor failure; therefore, salinity data is unavailable until replacement sensor is obtained.

Abbreviation

NL: Not Listed, MPN: Most Probable Number, cfu: Colony Forming Unit, mL: milli Litre, FAU: Formazin Attenuation Unit, NTU: Nephelometric Turbidity Unit, ppt: Parts Per Thousand, DB: Designated Bathing Beach, MB: Moderate Use of Bathing, LB: Light Use of Bathing, IB: Infrequent Use of Bathing

NA: Not Available, however data will be available at a later date; ND: No Data due to equipment failure or logistics problems or time delay or methodology problem or combination of all; NW: No Water, stream dry or water stagnant or water level too low for sample collection or water dirty/murky.

Comments

1. Temperature[#]
   Subtropical regions (south of Cape Canaveral and Tampa Bay, Florida, and Hawaii).
   Short-term Max. 32.2^{o}C, Max. True daily mean 29.4^{o}C (average of 24-hourly temperature reading).
   Temperature is the measure of warmth and coldness, reported as an average and measured in degrees celcius (°C).
2. pH
   Changes to pH can be caused by a range of potential water quality problems (e.g., low values due to acid sulphate runoff). pH values are also related to soil geology and may be naturally low or high (in limestone areas). High pH values can also be caused temporarily when high rates of photosynthesis by aquatic plants (including algae) lead to a decrease in carbon dioxide, and therefore a decrease in carbonic acid in the water.
3. Salinity
   A measure of the amount of dissolved salts in the water, and therefore an indicator of salinity. Excess salinity in freshwater streams occurs as a result of excess soil salinity, which may be caused by excess land clearing and changes to the groundwater table. Salinity is reported as parts per thousand (ppt).
4. Dissolved Oxygen^
   DO levels indicate how much oxygen is in the water. Low DO levels indicate an abnormal disturbance in the ecosystem such as an algal bloom. DO is measured in percentage (%).
   Low DO: 3.5 mg/L at 26C leads to 100% mortality of *Acipenser oxyrhincus*
   2.7 mg/L at 19C leads to 22% mortality of *Acipenser oxyrhincus*
   <3.7 mg/L Demersal finfish biomass diminishes
   <3.5 mg/L Species richness diminishes
   Below 2 mg/L infaunal species migrate to sediment surface and epifaunal species move to better aerated water.
   Oxygen is essential for life processes of most aquatic organisms. Many aquatic organisms will suffocate if there is insufficient oxygen in the water.
5. Suspended Solids[@]
   Settleable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10% from the seasonably established norm for aquatic life. Total suspended solids (TSS) are non-living (inorganic) such as silt and mud; and organic matter such as animal and plant material found in the water. The presence of large amounts of particles are responsible for creating the murky appearance of dirty water and can quickly kill coral reefs. TSS is measured in milligrams per litre (mg/L).
6. Turbidity
   Water clarity (the degree of light penetration) is important as aquatic plants depend on light to photosynthesize and produce oxygen. Large amounts of sediment in a water body can also smother benthic organisms. Suspended solid results are interactive and interdependent with turbidity. Expert interpretation needed. Turbidity is measured as FAU.
7. Enterococci[β]
   The presence of bacteria Enterococci *sp* is monitored as an indicator of human and animal waste pollution. The higher the numbers of Enterococci bacteria present in a sample, the greater the amount of faecal pollution in the water. Bacteria count is measured in Most Probable Number of Enterococci cells per 100mL of sample (MPN/100mL).
8. Nutrients (Nitrate, Nitrite, Ammonia, Phosphate)
   High nutrient concentrations in a water body (eutrophication) may lead to excessive weed and algal growth. Excess nutrients enter a water body through several means, including discharge of treated sewage, storm water, and in run-off from land, for example as fertiliser, animal waste, or decaying plant matter.
9. Chlorophyll-a
   Chlorophyll-a is a pigment found in green plants, including aquatic plants. Measuring the amount of chlorophyll-a in the water therefore indicates the amount of green algae present in the water. High concentrations of algae (algal blooms) may harm other aquatic organisms, either through the production of toxins, reduction of available light through covering the water surface, or by using all available oxygen during respiration at night. Chlorophyll-a is measured in micrograms per litre (µg/L).
10. Rainfall
    Rarotonga: daily rainfall data is provided by the Cook Islands Meteorological Service.
    Aitutaki: daily rainfall data is recorded by MMR Staff at Amuri (Aitutaki Marine Research Centre – AMRC) and at Vaipae (Rowan Strickland's residence).
    Rainfall is measured in millimetres (mm) and reported as total rainfall per month, total number of days that had rainfall and the highest amount of rainfall in 1-day and date(s).

[#]EPA Quality Criteria for Water Gold Book 1986
^EPA Ambient Aquatic Life Water Quality Criteria for DO (Saltwater): Cape Cod to Cape Hatteras Nov 2000
[@]EPA Quality Criteria for Water Red Book 1976
[β]WHO Guidelines on Recreational Water Quality for Coastal and Fresh Waters 2021