

05th November 2024



GBON National Gap Analysis Republic of Palau

Systematic Observations
Financing Facility

**Weather
and climate
data for
resilience**





Screening of the National Gap Analysis (NGA) of Palau

WMO Technical Authority screens the GBON National Gap Analysis to ensure consistency with the GBON regulations and provides feedback for revisions as needed. *The screening of the NGA is conducted according to the SOFF Operational Guidance Handbook, version: 04.07.2023 and the provisions in Decision 5.7 of the SOFF Steering Committee.*

Following iterations with the peer advisor and beneficiary country, WMO Technical Authority confirms that the National Gap Analysis is consistent with GBON regulations.

Date: 11 November 2024

Signature:

Albert Fischer

Director, WIGOS Branch, Infrastructure Department, WMO

GBON National Gap Analysis Report

Republic of Palau

Beneficiary Country Focal Point and Institute	Maria Ngemaes, Meteorologist in Charge, WSO Palau
Peer Advisor Focal Point and Institute	Tim Donovan, Senior International Development Manager, Met Office, UK

1. Country information from the GBON Global Gap Analysis

Table I. WMO GBON Global Gap Analysis (June 2023). Illustration of the information that the WMO Secretariat provides to each country

A. GBON horizontal resolution requirements	B. Target	C. Reporting (GBON compliant) ¹	D. Gap to improve	E. Gap new	F. Gap total
	[# of stations]				
Surface stations Standard density ² 200 km	3	0	2	1	3
Upper-air stations over land Standard density ² 500km	1	1	0	0	0

2. Analysis of existing GBON stations and their status against GBON requirements

Table II. Assessment of existent stations per their operational status and network ownership

GBON Requirements	Existing observation stations (# of stations)	
	NMHS network	Third-party network

¹ The rationale for classifying surface and upper-air stations as reporting is based on the WIGOS Data Quality Monitoring System (WDQMS) for the chosen time period (WMO GBON Global Gap analysis, June 2023). Stations with data availability more than 80% on at least 80% of days, are considered as reporting. Other listed stations are counted as having the possibility to be improved.

² For SIDS, for the WMO GBON Global Gap Analysis in June 2023, the EEZ area has been added to the total surface area which is the basis for the target number of stations. The standard density requirements for SIDS have been calculated with 500 km for surface stations and 1000 km for upper-air stations.

	Reporting (GBON compliant) ³	To improve	Reporting (GBON compliant) ³	To improve
Surface land stations Standard density ⁴ 200km Variables: SLP, T, H, W, P, SD	0	2	0	1
Upper-air stations operated from land Horizontal resolution ⁴ : 500km Vertical resolution: 100m, up to 30 hPa Variables: T, H, W	1	0	0	0
Surface marine stations in Exclusive Economic Zones: ⁷ 500 km Variables: SLP, SST				
Upper-air stations operated in Exclusive Economic Zones: ⁵ 1000 km Vertical resolution: 100m, up to 30 hPa Variables: T, H, W				

Table III. Assessment of existing GBON stations per station characteristics. Station type: S: Surface, UA: Upper-Air; M: Marine; Owner of the station: NMHS or name of third-party; GBON variables: SLP: Atmospheric pressure; T: Temperature; H: Humidity; W: wind; P: Precipitation; SD: Snow depth; SST: Sea surface temperature; Reporting cycle: Number of observation reports exchanged internationally per day (0-24); GBON compliance: whether the station is GBON compliant or not (see GBON guide on compliance criteria).

Station name	Station type (S/UA)	Owner (NMHS/third-party)	Funding source	GBON variable measured						Reporting cycle	GBON Compliance (Y/N)
				SLP	T	H	W	P	SD		
Weather Service Office, Koror, Palau WCI	UA	NMHS	NOAA	X	X	X	X	X		2	Y

³ The rationale for classifying surface and upper-air stations as reporting is based on the WIGOS Data Quality Monitoring System (WDQMS) for the chosen time period during the development of National Gap Analysis Stations with data availability more than 80% on at least 80% of days, are considered as reporting. Other listed stations are counted as having the possibility to be improved.

⁴ For SIDS, for the WMO GBON Global Gap Analysis in June 2023, the EEZ area has been added to the total surface area which is the basis for the target number of stations. The standard density requirements for SIDS have been calculated with 500 km for surface stations and 1000 km for upper-air stations.

⁵ Although GBON marine stations and stations in EEZ are not part of initial SOFF scope, peer advisors are encouraged to analyze in this step when considered relevant e.g. SIDS, the status of current marine stations for future GBON marine observations investments.

Weather Service Office, Koror, Palau WCI	S	NMHS	UNDP	X	X	X	X	X	NA	24*	N
Melekeok	S	NMHS	UNDP	X	X	X	X	X	NA	24	N
Kayangel	S	NMHS	UNDP	X	X	X	X	X	NA	24	N
Peleliu	S	NMHS	UNDP	X	X	X	X	X	NA	24	N
Helen Reef	S	UCSD Xmet	UCSD Xmet	X	X	X	X	X	NA	24	N
Tobi Island (Hatobohei)	S	UCSD Xmet	UCSD Xmet	X	X	X	X	X	NA	24	N
Angaur (Ngeaur Island)	S	UCSD Xmet	UCSD Xmet	X	X	X	X	X	NA	24	N
Ulong	S	UCSD Xmet	UCSD Xmet	X	X	X	X	X	NA	24	N
Kayangel	S	UCSD Xmet	UCSD Xmet	X	X	X	X	X	NA	24	N
Ngeruktabel	S	CRRF	CRRF	X	X	X	X	X	NA	24	N
Melekeok	S	CRRF	CRRF	X	X	X	X	X	NA	24	N

3. Results of the GBON National Gap Analysis

Table IV. Results of the GBON national gap analysis. SLP: Atmospheric pressure; T: Temperature; H: Humidity; W: wind; P: Precipitation; SD: Snow depth; SST: Sea surface temperature.

GBON requirements	Global GBON target	Approved national target	Reporting	Gap	
				To improve	New
				[# of stations]	
Surface land stations	3	3	0	3	0
Upper-air stations operated from land	1	1	1	0	0
Surface marine stations in Exclusive Economic Zones:⁶ Density 500 km Variables: SLP, SST Observing cycle: 1h					
Upper-air stations operated in Exclusive Economic Zones:⁷ Density 1000 km Vertical resolution: 100 m, up to 30 hPa					

⁶ Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyze in this step when considered relevant e.g. SIDS, the need for future GBON marine observations investments according to the GBON requirements.

⁷ Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyze in this step when considered relevant e.g. SIDS, the need for future GBON marine observations investments according to the GBON requirements.

Variables: T, H, W Observing cycle: twice a day					
--	--	--	--	--	--

3.1 Recommended existing surface, upper-air and marine⁹ stations to be designated to GBON

Table V. Recommended existing surface, upper-air and marine stations to be designated to GBON.

Station name	Station type (S/UA/M ¹⁰)
Airai	S/UA
Melekeok	S
Kayangel	S
Peleliu	S

⁸ Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyze in this step when considered relevant e.g., SIDS, the need for future GBON marine observations investments according to the GBON requirements.

⁹ Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyze in this step when considered relevant e.g., SIDS, the need for future GBON marine observations investments according to the GBON requirements.

¹⁰ Please see guidance on marine stations in Section 2 on Scope.

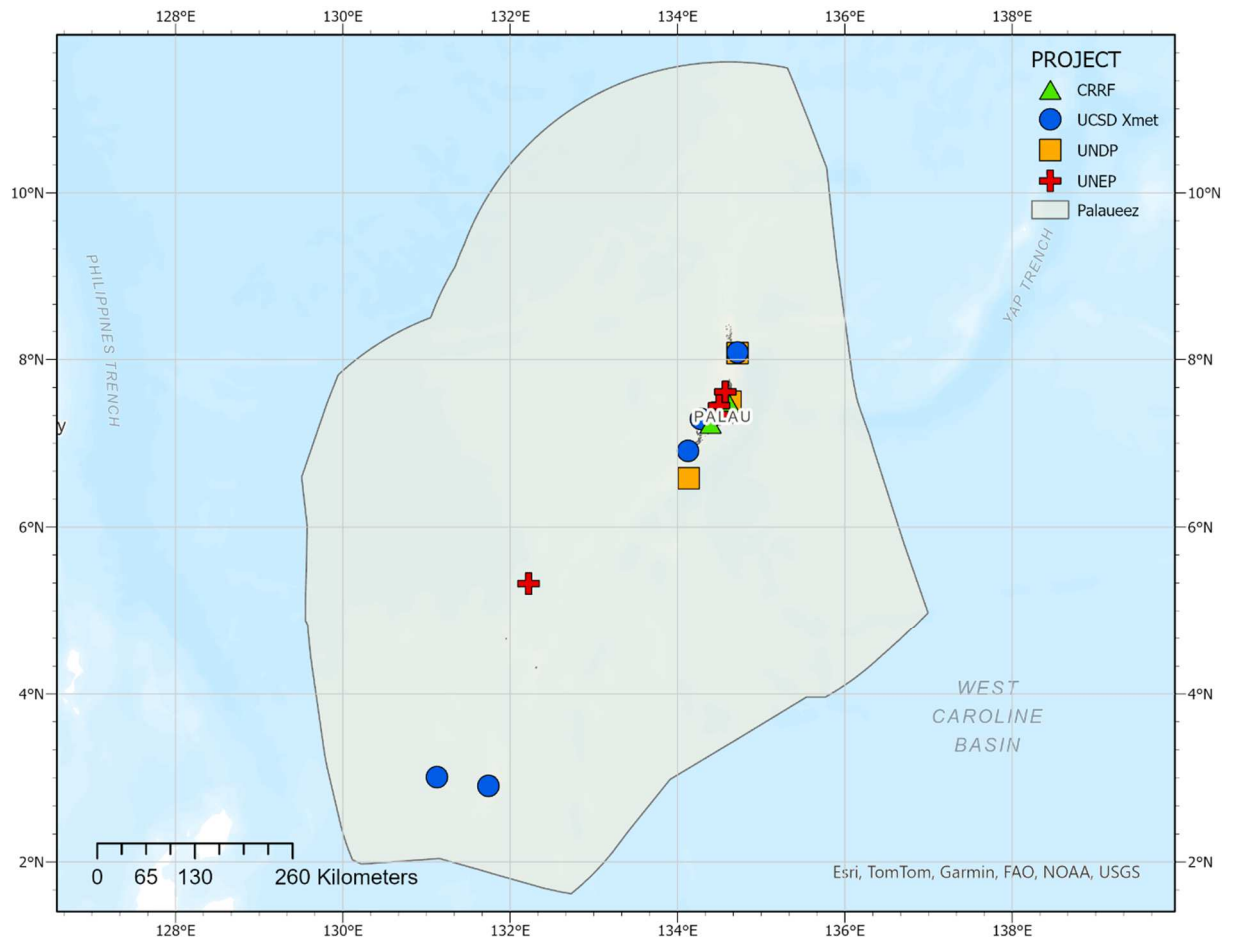


Figure 1 – existing (UNDP, UCSD and CRRF) and planned (UNEP CisPAC5) surface stations and the exclusive economic zone (EEZ) in yellow.

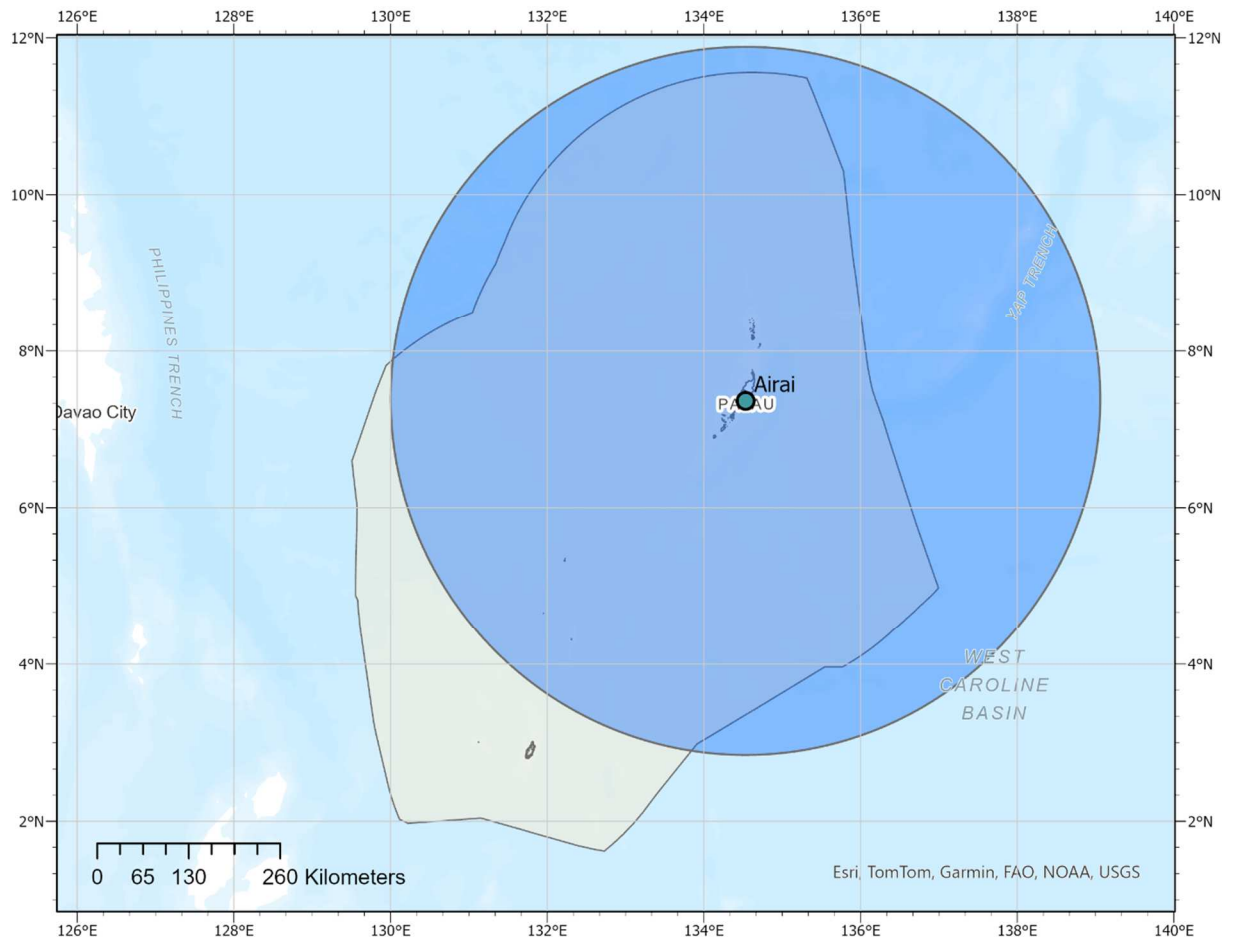


Figure 2 – GBON Upper Air site in Palau showing 500km radius circle. Palau EEZ shown in yellow.

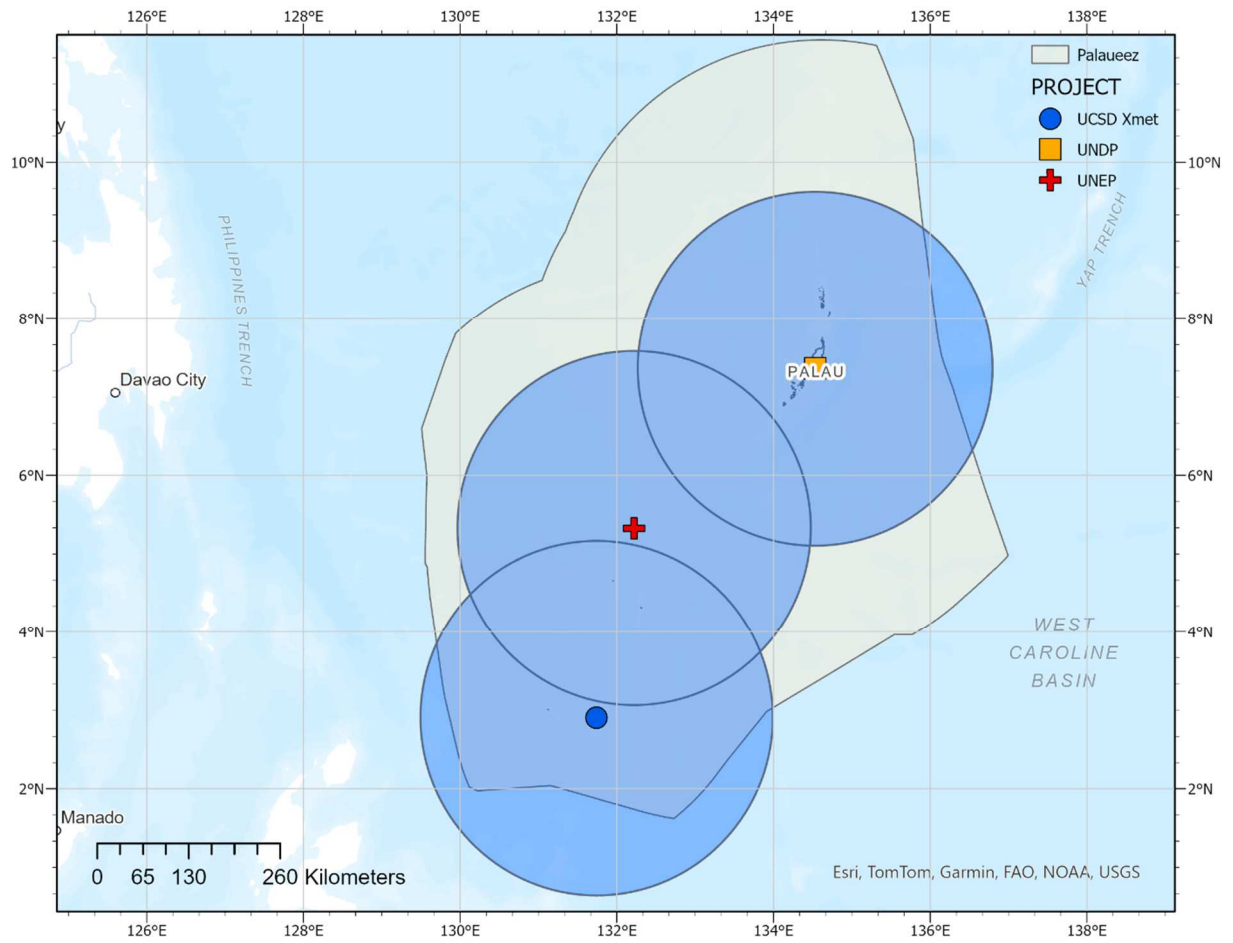


Figure 3 – Proposed surface GBON stations with 250km radius circles. Palau Exclusive Economic Zone (EEZ) shown in yellow.

Appendices:

The Coral Reef Research Foundation (CRRF) established an autonomous weather station on Ngeanges Island in the central rock islands in 2007. The station is on a 40ft (12m) tower on top of a 100ft (30m) rock island, as there is no ideal site in the Rock Islands due to the topography.

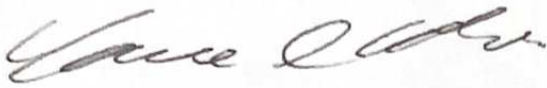
The Scripps Institution of Oceanography (SIO), University of California San Diego (UCSD) has provided 5 “Xmet” autonomous weather stations. The Xmet data is not currently shared via WIS or GTS and is available online <http://www.palauweather.org/>.

A previous investment through United Nations Development Programme (UNDP) Palau Disaster Preparedness And Improved Infrastructure project included the installation of 4 AWS in Palau between 2018 and 2022. The data collected by these stations are currently not shared via WIS or GTS.

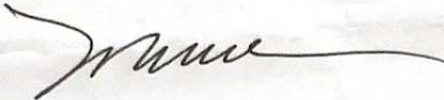
The United National Environment Programme (UNEP) are managing a Green Climate Fund (GCF) funded programme in Palau, Enhancing Climate Information and Knowledge Services for resilience in 5 Pacific countries (UNEP CIS-Pac5) <https://www.greenclimate.fund/project/fp147#documents>. CIS-Pac5 is installing 4 AWS this year. With support from SOFF to implement WIS2.0 as detailed in the National Contribution Plan, the GBON requirement for 3 surface observations will be fully satisfied by this installation campaign. It will exceed the GBON requirement and there is an expectation from the programme that SOFF will support this observations network and the existing UNDP stations in the future. The sustainability strategy of the programme developed as a part of the funding request jointly with WMO mentioned SOFF as one of its key components. The details of the transition from the current to the future network as well as the need to support the additional stations installed under CIS-Pac5 project will be outlined in the National Contribution Plan.

4. Report completion signatures

Peer Advisor signature



Beneficiary Country signature



DILWEI M. NGEMAES

WMO Technical Authority screening signature

