June 2025

GBON National Gap Analysis

Systematic Observations Financing Facility

Weather and climate data for resilience

WEATHER CLIMATE WATER

Screening of the National Gap Analysis (NGA) of Vanuatu

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: June 2025

Signature: 

Albert Fischer

Director, WIGOS Branch, Infrastructure Department, WMO

GBON National Gap Analysis Report
Vanuatu
December 2024

Beneficiary Country Focal Point and Institute	Mr Levu Antfalo, Director, Vanuatu Meteorology and Geohazards Department
Peer Advisor Focal Point and Institute	Ms Emma Coombe, Senior Adviser – International Development, Meteorological Service of New Zealand Ltd

1. Country information from the GBON Global Gap Analysis

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

II. GBON horizontal resolution requirements	B. Target	C. Reporting to req.	D. Gap to improve	E. Gap new	F. Gap total
Surface stations Standard density 200 km	3	2	1	0	1
Upper-air stations over land Standard density 500km	1	0	1	0	1

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	
	Reporting to req.	To improve	Reporting to req.	To improve
Surface land stations Standard density 200km Variables: SLP, T, H, W, P, SD	2	1	0	0
Upper-air stations operated from land Horizontal resolution: 500km Vertical resolution: 100m, up to 30 hPa Variables: T, H, W	0	1	0	0
Surface marine stations in Exclusive Economic Zones: 500 km Variables: SLP, SST	0	0	0	0

Table III. Assessment of existing GBON stations per station characteristics.

Station name	Station type (S/UA/M)	Owner (NMHS/3rd party)	Funding source	GBON variable measured							Reporting cycle (obs/day)	GBON Compliant (Y/N)
				SLP	T	H	W	P	SD	SST		
Sola (M)	S	NMHS	VMGD	X	X	X	X	X			8	N
Saratamata (M)	S	NMHS	VMGD	X	X	X	X	X			8	N
Pekoa Airport (M)	S	NMHS	VMGD	X	X	X	X	X			24	Y
Lamap (M)	S	NMHS	VMGD	X	X	X	X	X			0	N
Bauerfield (M)	S	NMHS	VMGD	X	X	X	X	X			24	Y
White Grass Airport (M)	S	NMHS	VMGD	X	X	X	X	X			8	N
Aneityum (M)	S	NMHS	VMGD	X	X	X	X	X			8	N
Bauerfield	UA	NMHS	VMGD		X	X	X	X			1	N
Torres Aero AWOS	S	NMHS	RESPAC	X	X	X	X	X			0	N
Sola Airport AWS	S	NMHS	GEF	X	X	X	X	X			0	N
Lojmoli Airport AWS	S	NMHS	GCF	X	X	X	X	X			0	N
Longana Airport AWS	S	NMHS	GEF	X	X	X	X	X			0	N
VARTC AWS	S	NMHS	GCF	X	X	X	X	X			0	N
Pekoa AWOS	S	NMHS	JICA	X	X	X	X	X			0	N
Namplontafo AWS	S	NMHS	GIZ	X	X	X	X	X			0	N

Loltong Village AWS	S	NMHS	GEF	X	X	X	X	X			0	N
Lonorore Airport AWS	S	NMHS	GIZ	X	X	X	X	X			0	N
Norsup Airport AWS	S	NMHS	GEF	X	X	X	X	X			0	N
Olal AWS	S	NMHS	GCF	X	X	X	X	X			0	N
Lambumbu AWS	S	NMHS	GCF	X	X	X	X	X			0	N
Lamap AWS	S	NMHS	GEF	X	X	X	X	X			0	N
Rovo Bay AWS	S	NMHS	GCF	X	X	X	X	X			0	N
Epau, Efate AWS	S	NMHS	GIZ	X	X	X	X	X			0	N
Bauerfield AWOS	S	NMHS	JICA	X	X	X	X	X			0	N
Port Vila AWS	S	NMHS	GIZ	X	X	X	X	X			0	N
Dillon's Bay AWS	S	NMHS	GCF	X	X	X	X	X			0	N
White Grass Airport AWS	S	NMHS	GEF	X	X	X	X	X			0	N
Port Resolution AWS	S	NMHS	GCF	X	X	X	X	X			0	N
Aneityum AWS	S	NMHS	GEF	X	X	X	X	X			0	N

Notes 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. Current GBON stations shown in RED. (M) Manual surface observation stations. RESPAC – UNDP Disaster Resilience for Pacific Small Island Developing States. GIZ – German Corporation for International Cooperation. JICA – Japan International Cooperation Agency. GCF – Green Climate Fund. GEF – Global Environment Facility.

3. Results of the GBON National Gap Analysis

Table IV. Results of the GBON national gap analysis.

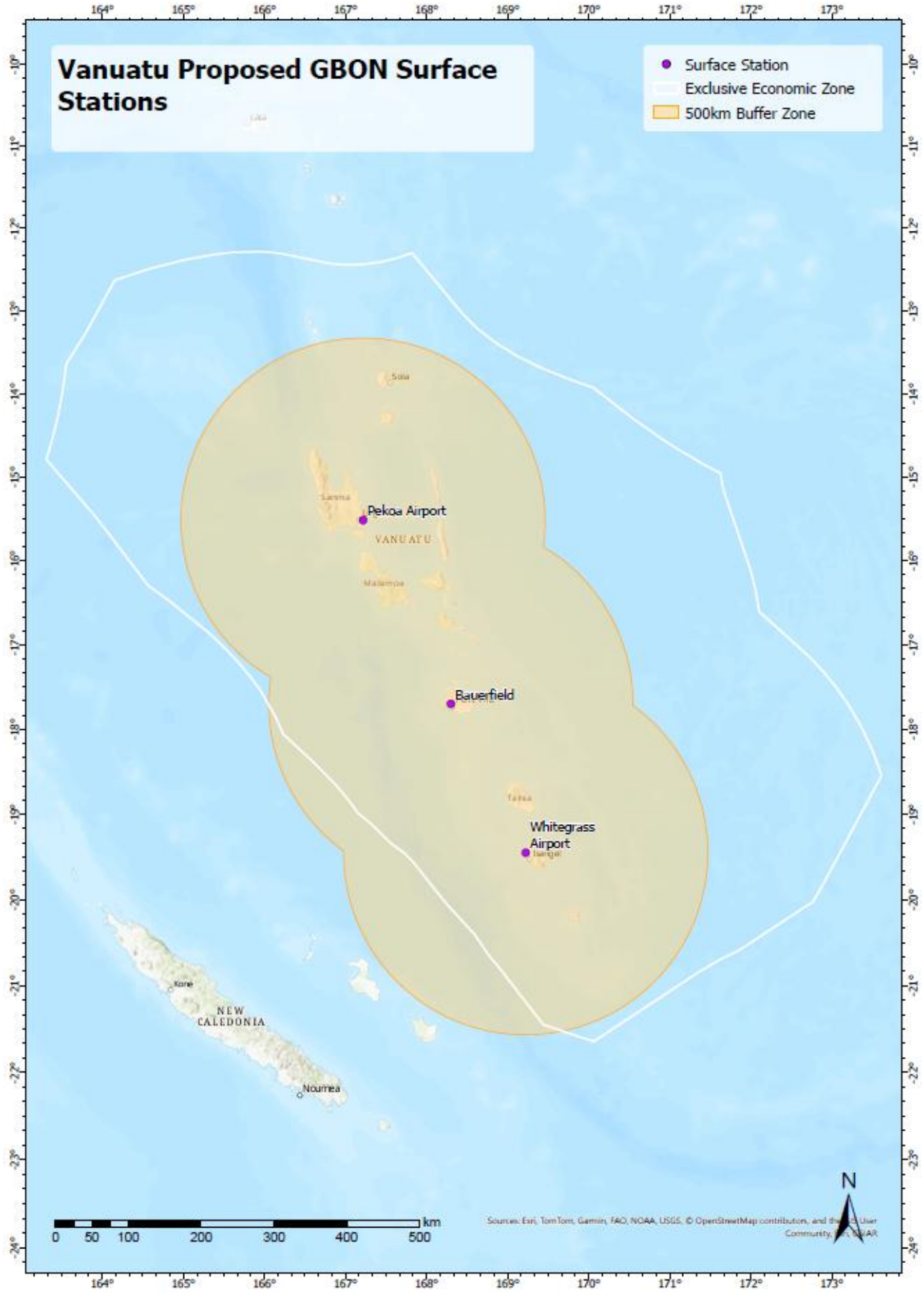
GBON requirements	GBON target (# of stations)	GBON Compliant stations (#)	Stations gap	
			To improve	New
Surface land stations Standard density 200km Variables: SLP, T, H, W, SD Observing cycle: 1h	3	0	3	0
Upper-air stations operated from land Standard density 500km Vertical resolution: 100m, up to 30 hpa Variables: T, H, W Observing cycle: twice a day	1	0	1	0
Surface marine stations in Exclusive Economic Zones: Density 500 km Variables: SLP, SST Observing cycle: 1h				

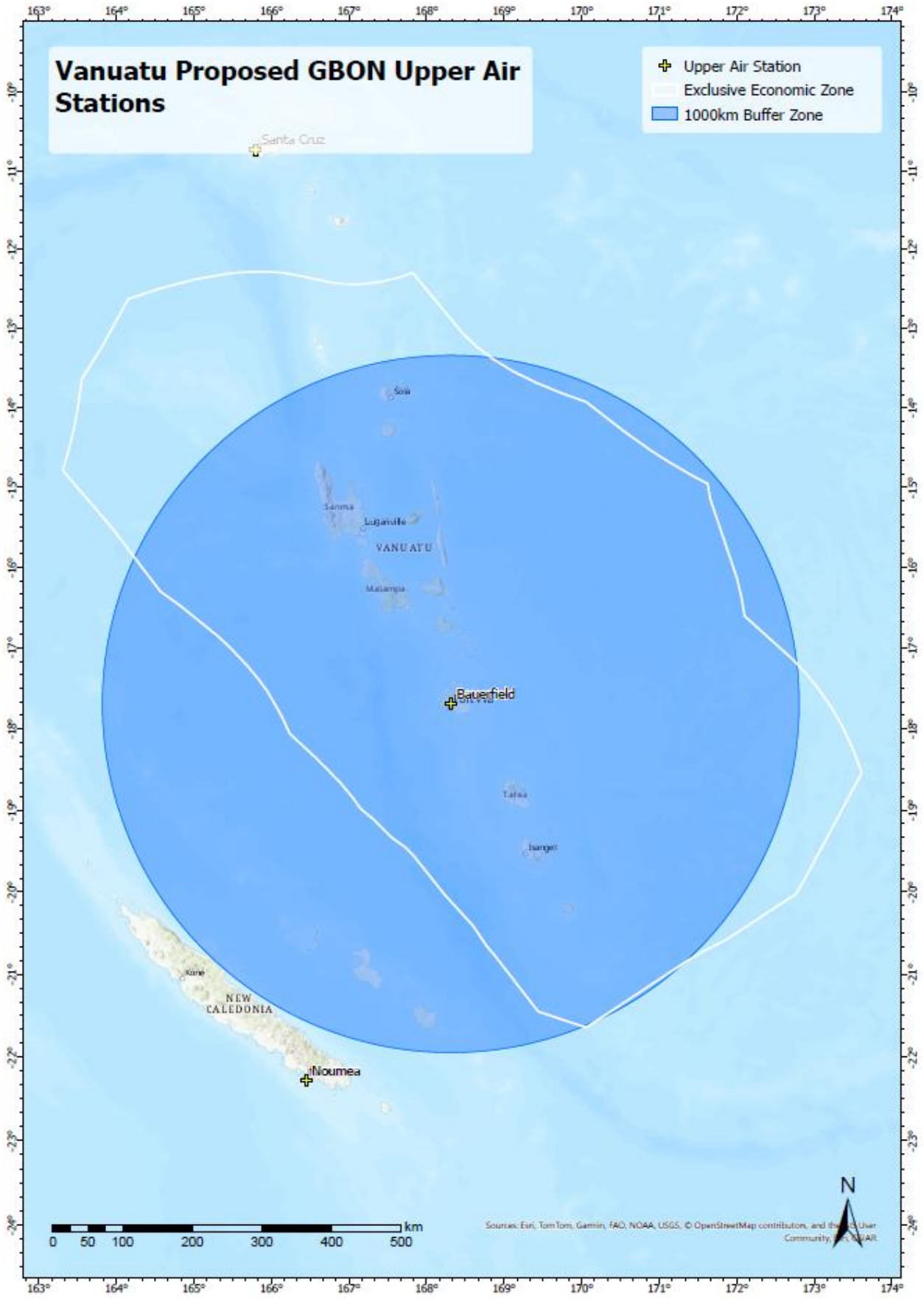
SLP: Atmospheric pressure; T: Temperature; H: Humidity; W: wind; P: Precipitation; SD: Snow depth; SST: Sea surface temperature.

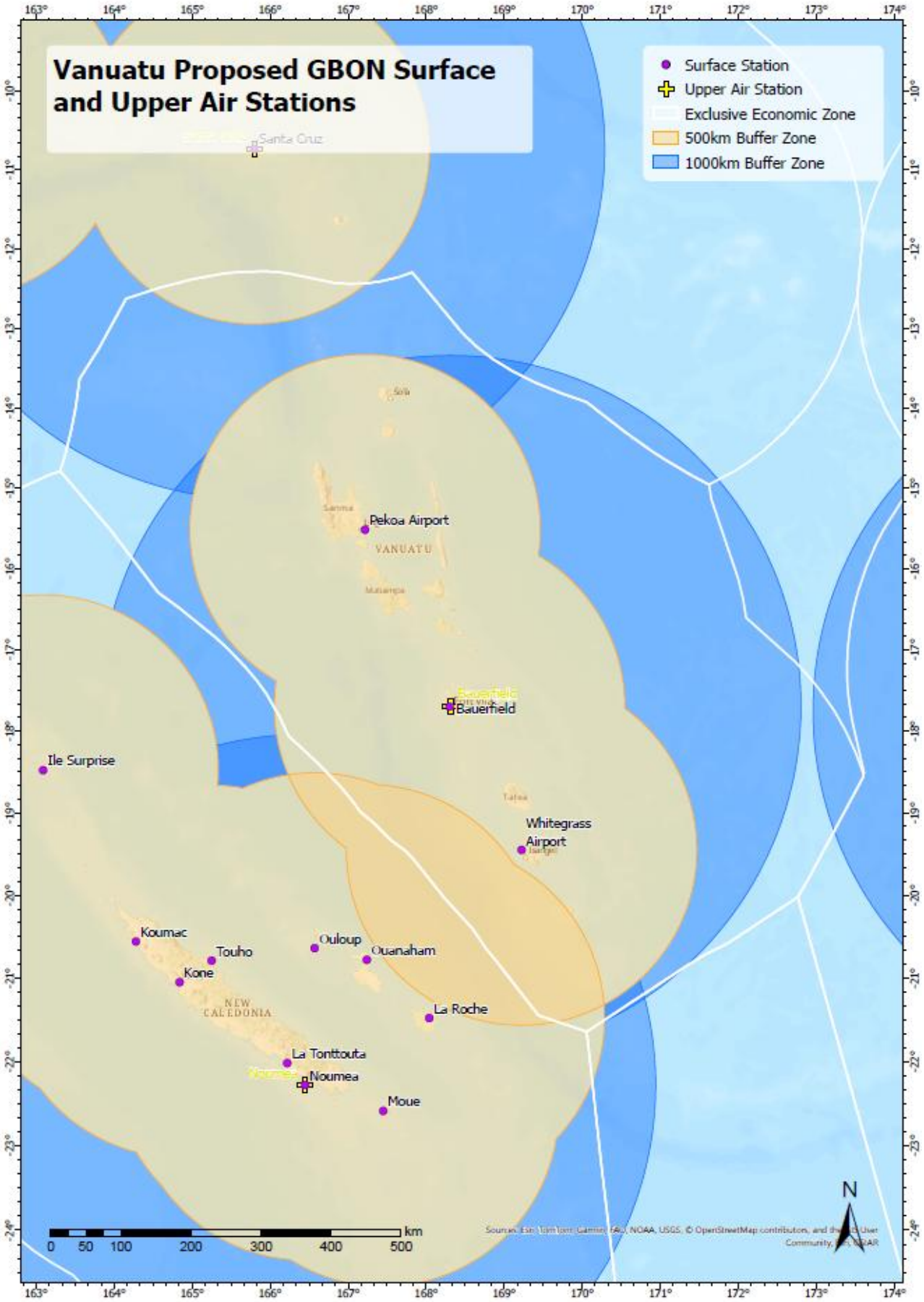
3.1 Recommended existing surface, upper-air and marine stations to be designated to GBON

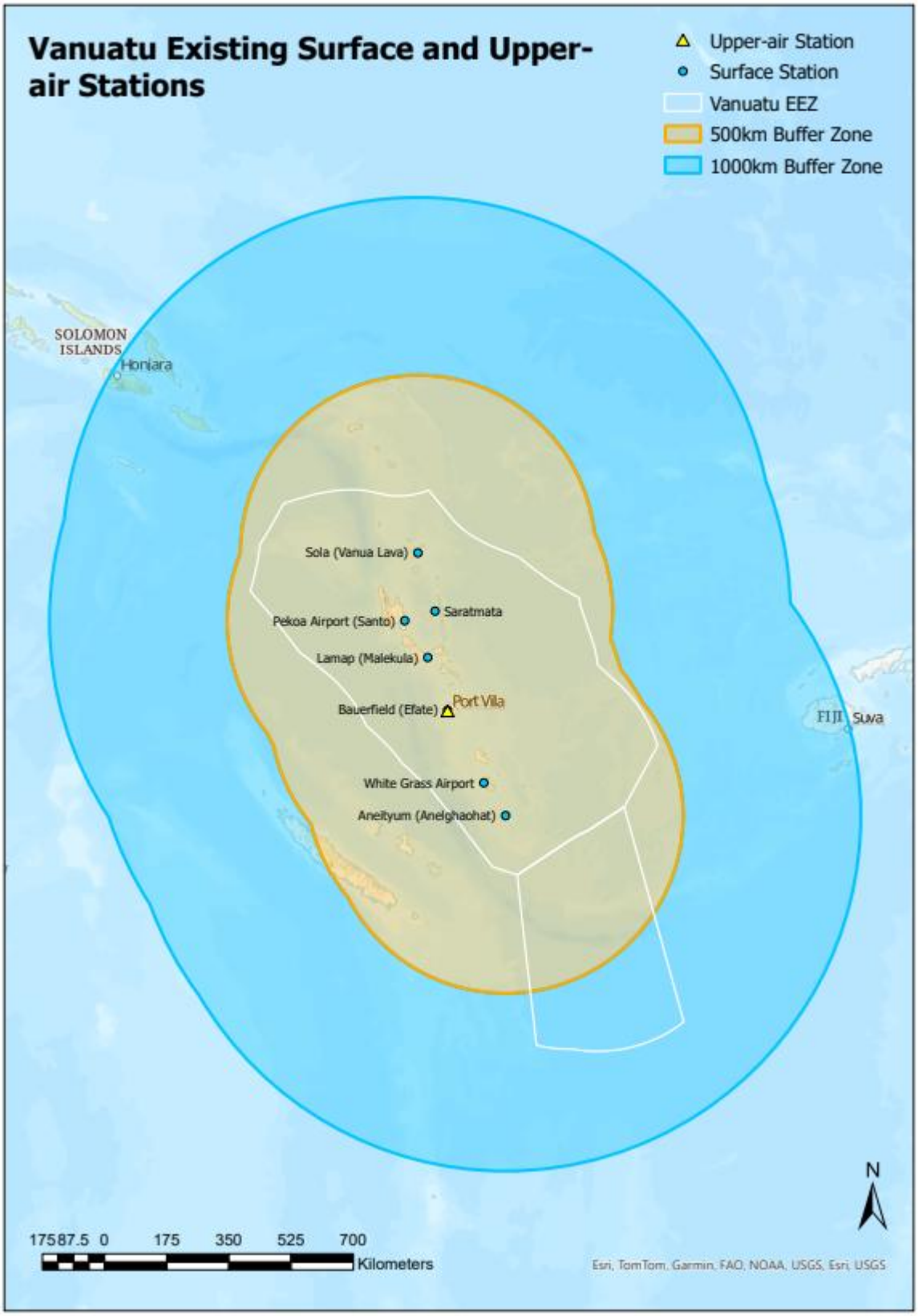
Table V. Recommended existing surface, upper-air and marine stations to be designated to GBON.

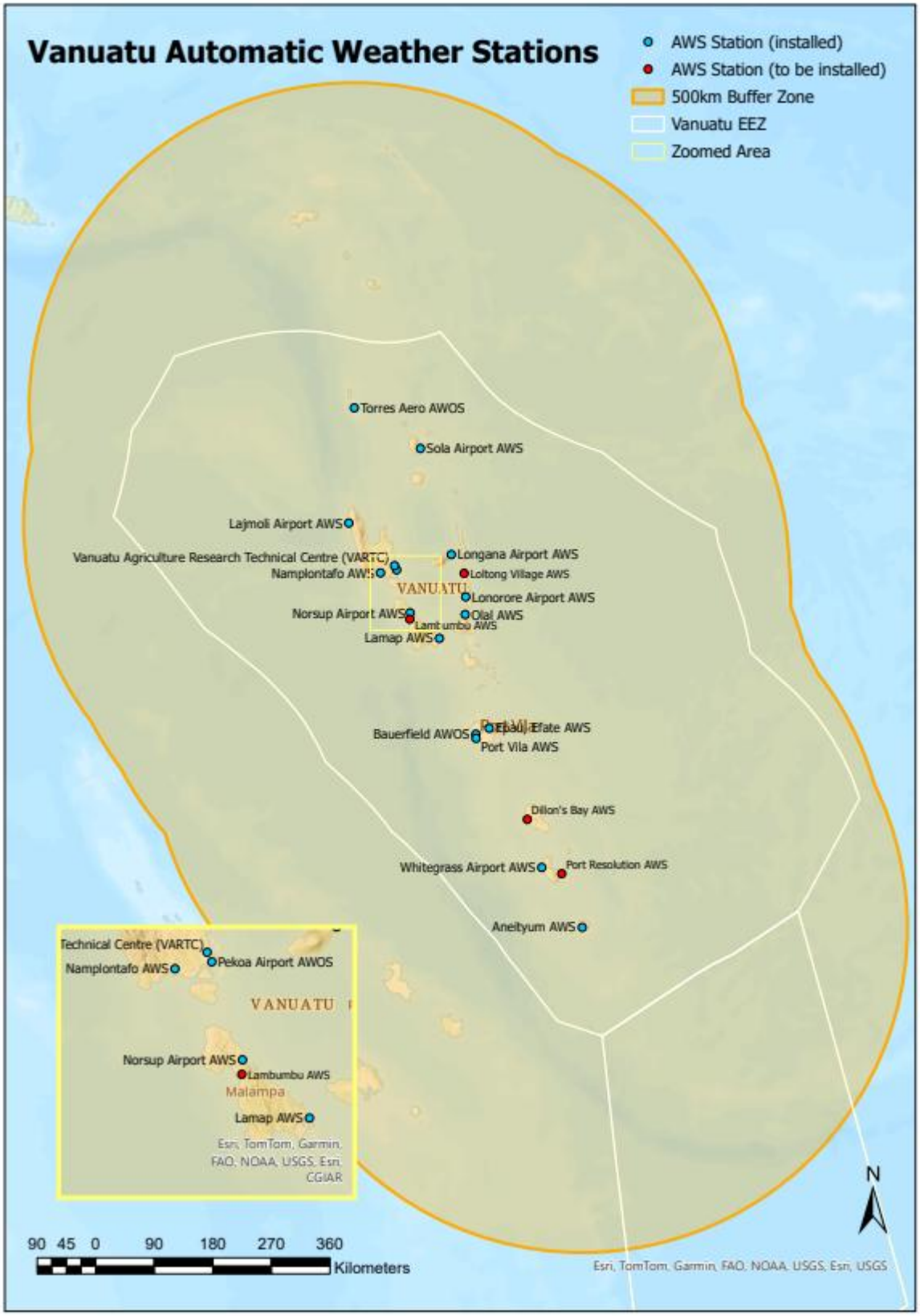
Station name	Station type (S/UA/M)
Pekoa Airport	S
Bauerfield	S, UA
White Grass Airport	S


Vanuatu Proposed GBON Surface Stations
Surface Station
Exclusive Economic Zone
500km Buffer Zone
Pekoa Airport
VANUATU
Bauerfield
Whitegrass Airport
NEW CALEDONIA
Noumea
0 50 100 200 300 400 500 km
N

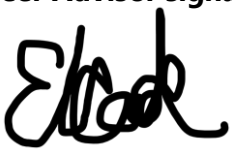

Vanuatu Proposed GBON Upper Air Stations
Upper Air Station
Exclusive Economic Zone
1000km Buffer Zone
Santa Cruz
Sola
Santo
Luganville
VANUATU
Malampa
Bauerfield
Tafea
Isangel
Koné
NEW CALEDONIA
Noumea
0 50 100 200 300 400 500 km
N


Vanuatu Proposed GBON Surface and Upper Air Stations
Surface Station
Upper Air Station
Exclusive Economic Zone
500km Buffer Zone
1000km Buffer Zone
Santa Cruz
Pekoa Airport
VANUATU
Bauerfield
Ile Surprise
Whitegrass Airport
Koumac
Touho
Kone
Ouloup
Ouanaham
NEW CALEDONIA
La Roche
La Tonttouta
Noumea
Moue
0 50 100 200 300 400 500 km
N


Vanuatu Existing Surface and Upper-air Stations
Upper-air Station
Surface Station
Vanuatu EEZ
500km Buffer Zone
1000km Buffer Zone
SOLOMON ISLANDS
Honiara
Sola (Vanua Lava)
Saratmata
Pekoa Airport (Santo)
Lamap (Malekula)
Bauerfield (Efate)
Port Vila
FIJI
Suva
White Grass Airport
Aneityum (Anelghaohat)
N
17587.5 0 175 350 525 700
Kilometers
Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, USGS


Vanuatu Automatic Weather Stations
AWS Station (installed)
AWS Station (to be installed)
500km Buffer Zone
Vanuatu EEZ
Zoomed Area
Torres Aero AWOS
Sola Airport AWS
Lajmoli Airport AWS
Vanuatu Agriculture Research Technical Centre (VARTC)
Namplontafo AWS
Longana Airport AWS
Loltong Village AWS
VANUATU
Lonorore Airport AWS
Norsup Airport AWS
Olal AWS
Lamt umbu AWS
Lamap AWS
Bauerfield AWOS
Epau / Efate AWS
Port Vila AWS
Dillon's Bay AWS
Whitegrass Airport AWS
Port Resolution AWS
Aneityum AWS
Technical Centre (VARTC)
Pekoa Airport AWOS
Namplontafo AWS
VANUATU
Norsup Airport AWS
Lambumbu AWS
Malampa
Lamap AWS
Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, CGIAR
N
90 45 0 90 180 270 360
Kilometers
Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, USGS

4. Report completion signatures.

Peer Advisor signature  Emma Coombe
WMO Technical Authority screening signature 
Beneficiary Country signature 

Appendix

The initial GBON analysis undertaken by WMO indicated that Vanuatu (land area 12,199 sq km, EEZ area 860,000 sq km) has a requirement for three surface and one upper air observation station to meet GBON standard requirements.

National Observing Network

The Vanuatu Meteorology and Geohazards Department (VMGD) currently operate an extensive surface observation network comprising 21 automatic and 7 manual stations. The manual stations report on a three hourly cycle and are exchanged internationally, however one is currently silent.

The existing automated stations are reporting the required GBON parameters except for snow depth. Observations from the automatic network are reported sub-hourly, though no data from the AWS network are currently exchanged internationally.

One AWS station is planned to be installed in 2025 under the van-KIRAP project, and a further six planned to be procured under the VCAP2 project in 2025. The locations are still to be determined.

The registered upper-air station for Vanuatu at Bauerfield was restored to operation in April 2025 through a project undertaken by the Bureau of Meteorology and provides one sounding a day at 0000UTC.

There are six wave buoys installed around Vanuatu measuring waves and sea surface temperature. Vanuatu also has four operational sea level gauges.

Supporting Technical Requirements

Reports are sent to the Bauerfield office from the outer stations by phone, email or HF radio, where they are compiled into message bulletins and transmitted on the GTS to the Bureau of Meteorology in Melbourne.

VMGD does not operate any WIS 2.0 facilities.