June 2024

GBON National Gap Analysis

St. Kitts and Nevis

Systematic Observations Financing Facility

Weather and climate data for resilience

WEATHER CLIMATE WATER

Screening of the National Gap Analysis (NGA) of

St. Kitts and Nevis

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: 12 August 2025

Signature:

Albert Fischer

Director, WIGOS Branch, Infrastructure Department, WMO

GBON National Gap Analysis Report
St. Kitts and Nevis

Beneficiary Country Focal Point and Institute	Elmo Burke, SKMS
Peer Advisor Focal Point and Institute	Anni Karttunen, FMI

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	1	0	1	0	1
Upper-air stations over land Standard density[2] 500km	1	0	0	1	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 (GBON compliant) [3]	To improve	Reporting (GBON compliant) [3]	To improve

[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.

[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.

Surface land stations Standard density [4] 200km Variables: SLP, T, H, W, P, SD	**0**	**2**	**0**	**0**
Upper-air stations operated from land Horizontal resolution[4]: 500km Vertical resolution: 100m, up to 30 hPa Variables: T, H, W	**0**	**0**	**0**	**0**
Surface marine stations in Exclusive Economic Zones:[7] 500 km Variables: SLP, SST	**0**	**0**	**0**	**0**
Upper-air stations operated in Exclusive Economic Zones:[5] 1000 km Vertical resolution: 100m, up to 30 hPa Variables: T, H, W	**0**	**0**	**0**	**0**

St. Kitts and Nevis has two surface weather observation stations registered in GBON for the WDQMS database in R. L. Bradshaw International airport and in V. W. Amory International airport. Both stations are manual and in active use only during the operating hours of the airport reporting all GBON parameters excluding snow-depth, which is not applicable in the area. During operating hours, e.g. 06:00 to 21:00 at R. L. Bradshaw International Airport, the reports are shared every hour. The stations are located close by each other (less than 20km apart) but are strategically important as they are located at the busy airports and operated by the separate meteorological services: St. Kitts Meteorological Services (SKMS) and Vance W. Amory Air Traffic Services/Meteorological Services (VAMS) due to the dual-island nation status. SKMS works under St. Christopher Air and Sea Ports Authority (SCASPA) and VAMS under Nevis Air and Seaports Authority (NASPA). The plans for the future of the services includes combining both separate meteorological services into St. Kitts and Nevis Meteorological Services (SKNMS) and seeking forecasting office status for it.

In addition to the GBON stations there is a network of eight operational surface weather stations in St. Kitts and four in Nevis. Due to the shortage of resources the station maintenance and sensor calibration activities have only been carried out when problems have arisen. Data is shared from both GBON stations from the St. Kitts office using the using the regional

[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.

wis2box platform for GBON observation dissemination. Message dissemination through this is currently done manually.

There is no private networks or observation sites in St. Kitts and Nevis.

St. Kitts and Nevis has no upper-air sounding station or operation.

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/M[6])	Owner (NMHS/3rd party)	Funding source	GBON variable measured							Reporting cycle (obs/day)	GBON Compliant (Y/N)
				SLP	T	H	W	P	SD	SST		
R. L. Bradshaw International airport	S	SCASPA	SCASPA	X	X	X	X	X	-	-	16 times per day, every hour from 06-21	N
V. W. Amory International airport	S	NASPA	NASPA	X	X	X	X	X	-	-	12 times per day, hourly during operating hours	N

3. Results of the GBON National Gap Analysis

To fulfill GBON compliance with hourly data reporting it is recommended to upgrade the manual stations to automatic ones, this way also replacing old or obsolete sensors. This way data dissemination is not any more reliant on the operating hours of the office and sensors can be supported with spare parts and calibration also in the future.

It is recommended to support the renewal of the station at **R. L. Bradshaw International Airport in St. Kitts.** The station has existing site infrastructure making the upgrade an easy to fix solution as only the sets of sensors need replacement.

St. Kitts and Nevis have never had an upper-air sounding station. SKMS operates as an aeronautical observing watch office and receives forecasts from the Antigua and Barbuda Meteorological Services. Antigua and Barbuda located approximately 100km from St. Kitts and Nevis is in the process of establishing a sounding station supported by SOFF. Besides Antigua and Barbuda, the region is well covered with the sounding stations in St. Maarten and Guadeloupe. Considering the

[6] Please see guidance on marine stations in Section 2 on Scope.

high density of the regional network (see Figure 2.), and the new efforts, including investing in human resources and increasing operation budget, needed for SKMS to establish the operations, it is not at this point recommended to establish a sounding station in St. Kitts and Nevis. The situation will be revisited and considered during the development of the National Contribution Plan.

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	1	1	1	1	0
Upper-air stations operated from land	0	0	0	0	0
Surface marine stations in Exclusive Economic Zones:[7] Density 500 km Variables: SLP, SST Observing cycle: 1h			0		
Upper-air stations operated in Exclusive Economic Zones: [8] Density 1000 km Vertical resolution: 100 m, up to 30 hPa Variables: T, H, W Observing cycle: twice a day			0		

[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.
[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.

3.1 Recommended existing surface, upper-air and marine[10] 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[11])
R. L. Bradshaw International airport	S
V. W. Amory International airport	S

The station that is recommended to be upgraded and supported with SOFF financing is the surface weather station in R. L. Bradshaw International Airport (22.3842°N, 73.1404°W)

[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] 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.

[11] Please see guidance on marine stations in Section 2 on Scope.

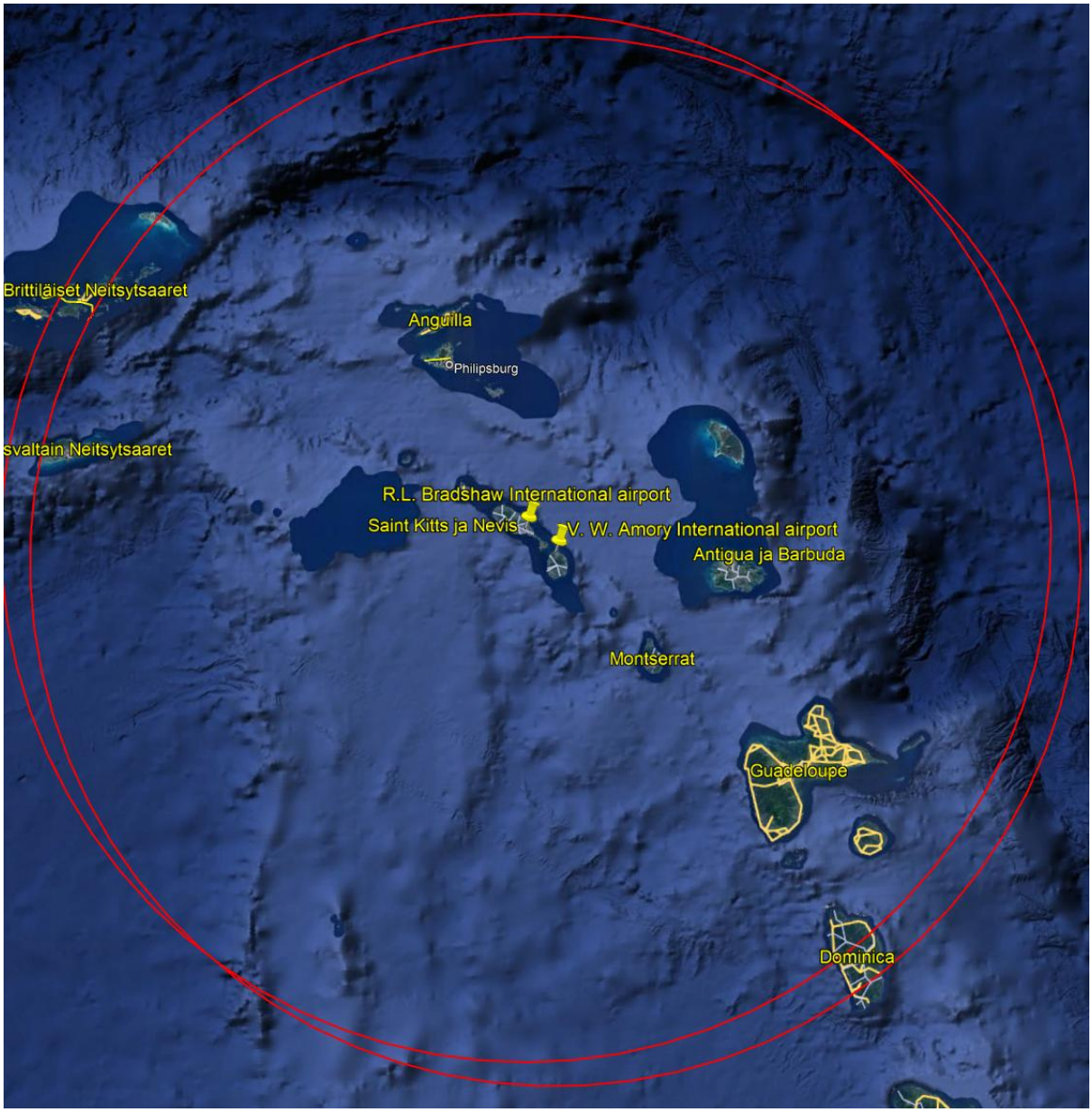

Figure 1 Both GBON registered surface weather stations: R.L. Bradshaw International Airport in St. Kitts and V. W. Amory International Airport in Nevis. Circles drawn with radius 250km to indicate SIDS required GBON 500km spacing.

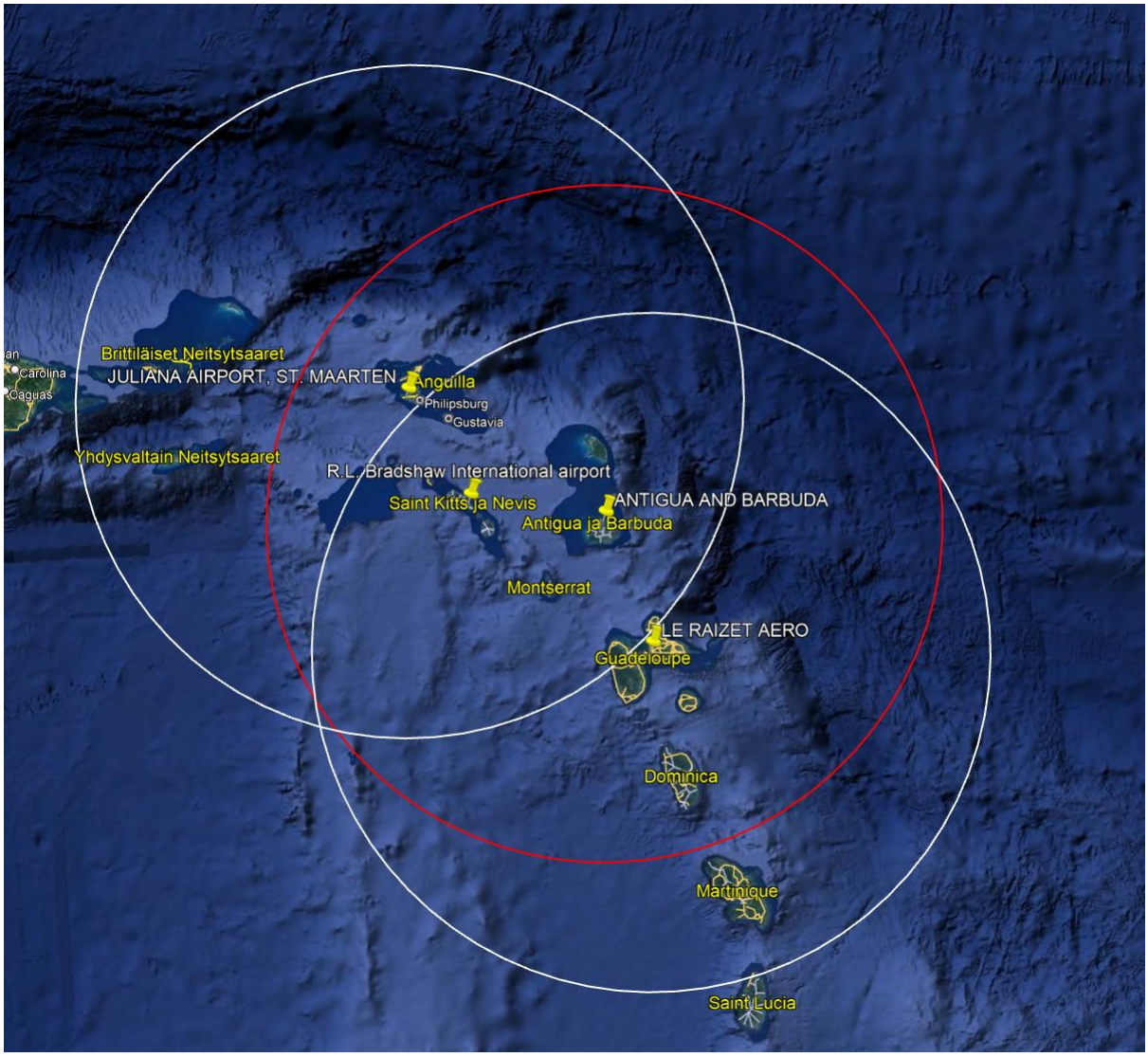

Figure 2. Existing upper-air stations registered in WDQMS platform are Julian Airport in St. Maarten and Le Raizet Aero in Point-a-Pitre International Airport in Guadeloupe (pointers on locations with white circles with 250km radius). Besides these stations one is planned to be invested in Antigua and Barbuda (pointer with red circle with 250km radius) approximately 100km from St. Kitts and Nevis.

4. Report completion signatures

Peer Advisor signature

On Behalf of Harri Pietarila, Director of Expert Services
Matti Eerikäinen, Head of Group, International Projects

Beneficiary Country signature

ST CHRISTOPHER AIR & SEA PORTS AUTHORITY
CHIEF EXECUTIVE OFFICER

Adeola Moore
Chief Executive Officer
St. Christopher Air and Sea Ports Authority

WMO Technical Authority signature

Annex 1.

Review of GAPs in capacity

In addition to number of GBON compliant observation stations, the discussions of Gap Analysis included a short review of Quality Management System (QMS), the status and capacity gaps in data transfer, database management, sensor maintenance and calibration, metadata, and quality control.

QMS

SKMS has implemented a QMS and has documentation based on ISO9001-2008 but has not yet been certified. Regarding the aviation serviced SKMS has documentation for ISO9001-2016 but not yet certifications.

Identified gaps:

- No sub-process for surface station
- Benchmarking of other organizations.

Central database

Currently there is no central data base or archiving system in SKMS. Data is transmitted to CIMH for storing and can be accessed later remotely. Synoptic data is archived in an Excel file and transmitted annually to CIMH. Data management, quality control mechanisms, capability to communicate with APIs for importing and exporting open data are needed. SKMS is in the process of receiving a climate data repository from Green Climate Fund project during 2024.

Identified gaps:

- IT support in observation data, transmission, quality control, processing and archiving. Support integration of observation data into new climate repository.
- Limited amount of staff with sufficient skillset, including programming skills.
- Benchmarking of other organizations.

Data transfer

Data is transferred from observation sites by real-time telecommunication or manual pickup. Unreliability of the real-time telecommunication has been an issue at some of the sites.

Dissemination to GTS is done via an FTP server and wis2box portal is used for manual dissemination of the GBON station information. Development is needed for the automated data transfer process to WIS2.0. The regional telecommunication hub for St. Kitts and Nevis is Washington.

Identified gaps:

- Renew communication for the GBON sites.
- Need for additional training to improve staff capacity.
- Benchmarking other organizations.

Metadata

Metadata is collected manually and stored locally.

Identified gaps:

- Metadata to be updated to GBON station web tool and national database.

Data quality control and assurance

Data quality control is done manually when the observations are done and disseminated or as periodic manual checks by cross referencing information.

SKMS has implemented reliability measures based on quality assurance /quality control as part of the QMS. Currently there is a need to update and automatize these procedures.

Identified gaps:

- Insufficient staff capacity, including programming skills.
- Automated QC/QA methods and algorithms.
- Benchmarking other organizations.

Sensor maintenance and calibration

Maintenance is performed as problems arise since resources have not been adequate for annual preventive maintenance. In maintenance issues that require assistance SKMS has utilized the support from the Caribbean Institute of Meteorology and Hydrology (CIMH). CIMH has remote access to most of the automatic network in St. Kitts and follow and recommend maintenance or calibration for the systems. Many of the SKMS technical officers have been trained in CIMH training programs. Currently there is a need for two entry level technical officers to be further trained up to the certified level at CIMH.

None of the sensors have been calibrated during the recent past. Previously SKMS have utilized CIMH calibration services, but due to CIMH's lowered capacity to calibrate and the lack of spares and budget to ship sensors for calibration, this has not been used for some time.

Identified gaps:

- Insufficient staff capacity to calibrate and maintain sensors.
- Need to increase the number of certified technical officers with two.
- Insufficient budget for maintenance and spare parts.
- Maintenance toolkit needs upgrading.
- Support regional collaboration with centralized spare part stock when feasible.
- Regional calibration services need strengthening to cover all needed basic parameters.
- Funding is needed to cover shipping and fees to use regional calibration services.