

17.07.2024

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# GBON National Gap Analysis

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Systematic Observations  
Financing Facility

**Weather  
and climate  
data for  
resilience**





## Screening of the National Gap Analysis (NGA) of St. Lucia

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 SOPFF Operational Guidance Handbook, version: 04.07.2023 and the provisions in Decision 5.7 of the SOPFF 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: 11/03/2025

Signature:

Albert Fischer

Director, WIGOS Branch, Infrastructure Department, WMO

# GBON National Gap Analysis Report

## St. Lucia

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### 1. Country information from the GBON Global Gap Analysis

Small Island Developing States (SIDS) are a group of 39 States and 18 Associate Members that share common challenges and vulnerabilities, including climate change, biodiversity, limited resources and natural disasters. They have been recognized by the United Nations since the 1992 U.N. Conference on Environment and Development held in Rio de Janeiro, Brazil.

The National Meteorological Service of St. Lucia (SLMS), namely the Saint Lucia Meteorological Services is a Member of WMO. Based on the GBON Global Gap Analysis conducted by WMO in June 2023 (Table I), and considering that Saint Lucia is a SIDS, SLMS should provide and internationally exchange data from one single surface station as well as from one single upper air station.

The surface station designated for GBON is located at Hewanorra International Airport. However, the station transmits data only on a 3 hourly base. Hence, the station is not GBON compliant. St. Lucia does currently not operate any upper-air stations.

**Table I. WMO GBON Global Gap Analysis (June 2023).**

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

<sup>1</sup> 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.

<sup>2</sup> 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.

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

SLMS currently operates a manual station at its international airport in Vieux Fort (Hewanorra Airport), and transmits data on a 3 hourly basis. Hewanorra serves as the international airport of Saint Lucia, located in the south of the island. However, due to its reporting frequency, the station cannot be regarded as GBON compliant (as can be seen in Table II).

In addition, SLMS operates another manual station at the regional airport G.F.L. Charles – Vigie Field. As well as 22 AWSs in other locations. It should be noted, that three different vendors provided those AWS. Each vendor has its own way to transmit its data(via cable, cellular and satellite).

Six out of those 22 AWSs are currently not functioning and only transmitting data in real-time.

### Upper-air stations

St. Lucia does not operate an upper-air station, since it is located roughly only 200kms from Barbados. SLMS is using the observations of the Barbados upper-air station.

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

<sup>3</sup> 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.

<sup>4</sup> 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.

<b>Upper-air stations operated in Exclusive Economic Zones:</b> <sup>5</sup> 1000 km Vertical resolution: 100m, up to 30 hPa Variables: T, H, W	0	0	0	0
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**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 <sup>6</sup> )	Owner (NMHS /3rd party)	Funding source	GBON variable measured						Reporting cycle (obs/day)	GBON Compliant (Y/N)	
				SLP	T	H	W	P	SD			SST
GFL Airport	S	NMHS	Gov	X	X	X	X	X	-	-	4 -6 *	N

\* - observations are made only during the working hours of the airport, mostly during daytime.

### 3. Results of the GBON National Gap Analysis

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##### Surface stations

According to the GBON low-resolution criteria (Tables IV&V) SLMS should operate at least one surface station, providing hourly measurements on a 24/7 basis (with the following requirements):

- The minimum number of internationally available reports should be not less than 80% of the total number of reports for the period.
- delayed reports should not constitute more than 5% of the total number.
- rejected reports, due to insufficient quality, should not constitute more than 5% of the total number of reports).

As aforementioned, the currently assigned GBON station is operating only on a three hourly basis. Following discussions with SLMS, it would however be recommended to change the designation to another station, which is also a manual station, located at George F.L. Charles Airport (Table III). George F.L. Charles Airport is the smaller of the two existing airports, located at the northwestern coast of the country. This station is currently only obtaining data during the operating hours (mostly daylight hours, depending on specific flights) of the airport. Hence, in order to achieve full GBON compliance, the station should be upgraded into an AWS through external funding possibilities (e.g.

<sup>5</sup>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.

<sup>6</sup> Please see guidance on marine stations in Section 2 on Scope.

OFF etc.). Both stations are transmitting data through wis2box, but as already mentioned, not on 24/7 basis.

This station is selected for two main reasons:

- a) the station is better representing the main urban area of the country. Thus, its data is more relevant for a large percentage of the population (one third of St. Lucia's inhabitants live in this area) and therefore being essential in terms of early Warning capability.
- b) this station has an almost continuous measurement history since the late 1960s, which makes it particularly relevant for potential climate services. Besides providing relevant data for the majority of the population, this station would also provide a suitable GBON coverage for the entire country, as can be seen in Figure 1.

However, there are several additional challenges associated with installing and maintaining such a station:

- - a. Data communication and transmission – the current AWS is unable to transmit its data to the headquarters in real-time. The data is also not transferred automatically into the WMO information system (WIS). Mostly because of non-functioning repeaters.
  - b. Spare parts – currently, the Meteorological Service has neither spare resources nor the financial resources to purchase these as well as proper storage for the equipment. Due to another limiting factor, that the stations were produced by three different vendors, it makes it even more complicated to purchase a sufficient amount of different spare parts.
  - c. Technical Staff – only a single technician, who also serves as an observer. The technician is trained only to maintain stations of one of these three vendors.
  - d. Harsh Environmental Conditions – A combination of general tropical conditions (high humidity and temperatures), frequent tropical storm and hurricane conditions (strong winds and intensive precipitation) and the vicinity of the ocean (high salinity) require a durable and suitable equipment.
  - e. Security – Stations in public places are prone to vandalism and theft.

#### Upper-air stations

Despite the fact that the GBON standard requires SLMS to operate at least one upper air station at its territory, one should take the already existing upper-air operational station in Barbados under consideration. The spatial resolution required for SIDS is 1000 km, whereas the distance between the countries is less than 200 km. Thus, the upper air station in Barbados also covers the requirements of St. Lucia (as can be seen in Figure 2). Thus, we recommend waiving St. Lucia from this requirement, while maintaining GBON compliance for surface stations. In general, the whole region needs to be taken into account, from a geographic as well as an operational viewpoint, to properly plan a network of upper air stations on top of what already exists.

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#### Marine surface and upper-air stations

St. Lucia possesses, relative to its land size, quite a large marine Exclusive Economic Zone and therefore, it might be of great benefit for a future project to install at least one marine surface station in the sea surrounding St. Lucia. In addition, St. Lucia is suffering from Hurricanes, tropical storms etc. from time

to time. An installment of a marine station, could also improve the quality of forecasting the impact of those major events.

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

<sup>7</sup> 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.

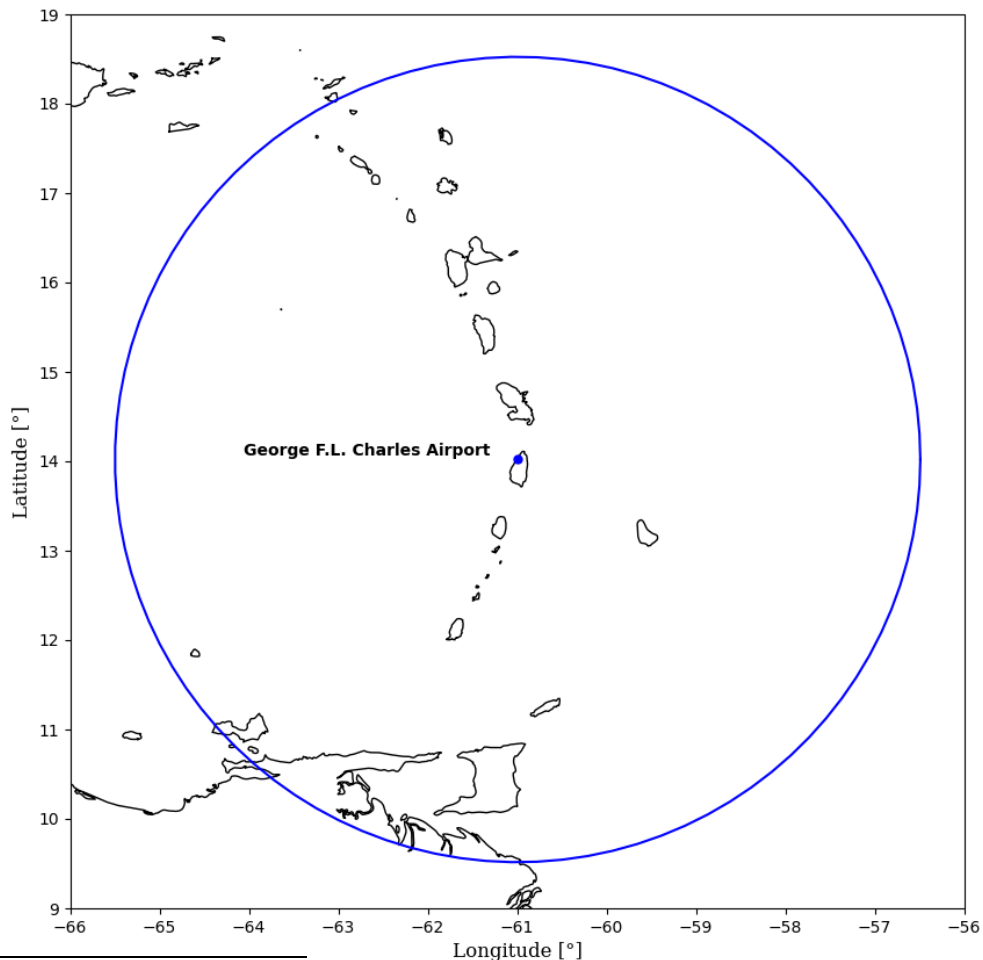
<sup>8</sup> Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyze in this step when considered relevant e.g. SIDS, the need for future GBON marine observations investments according to the GBON requirements.

### 3.1 Recommended existing surface, upper-air and marine<sup>10</sup> 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 <sup>11</sup> )
GFL Airport	S
(Barbados)	UA

**Figure 1. A map with the existing surface station for a low-resolution GBON (500 km). The blue circle is surrounding the entirety of St. Lucia.**



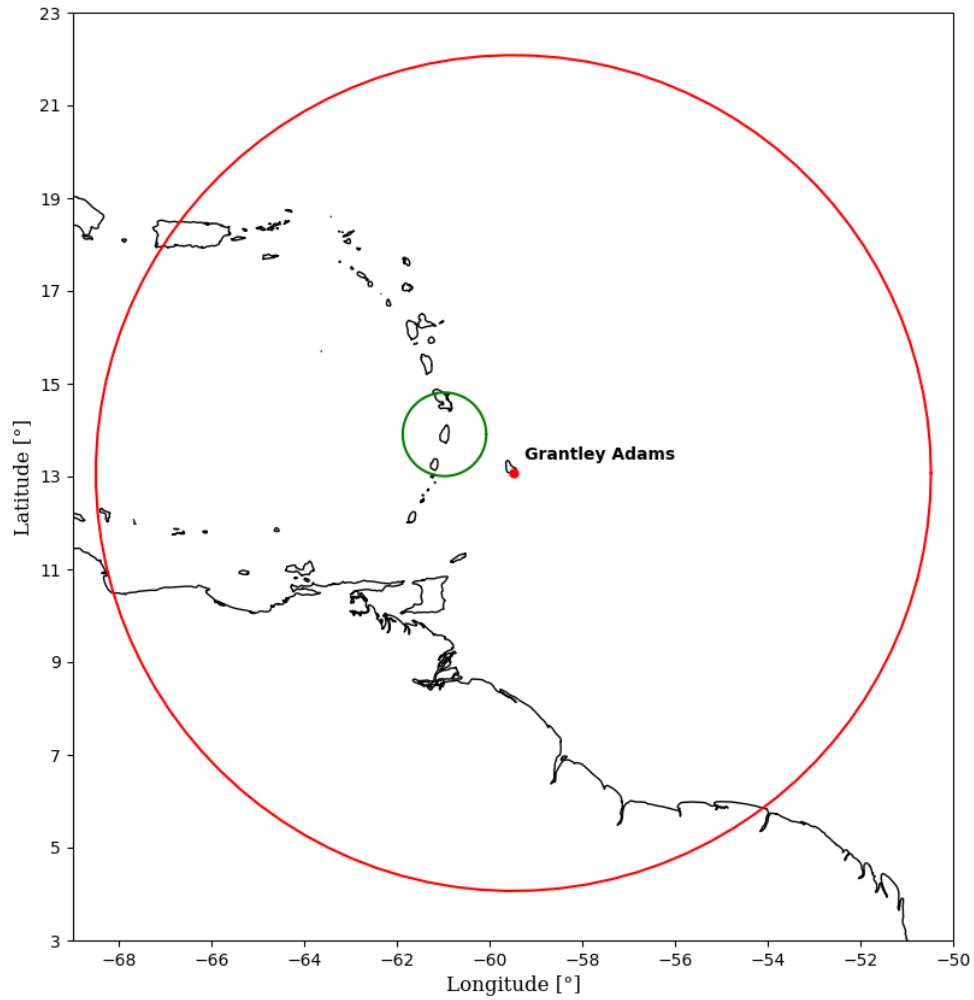
<sup>9</sup> Although GBON marine stations are not part of initial SOFF scope, peer advisors are encouraged to analyze in this step when considered relevant e.g., SIDS, the need for future GBON marine observations investments according to the GBON requirements.

<sup>10</sup> 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.

<sup>11</sup> Please see guidance on marine stations in Section 2 on Scope.



Figure 2. A map with the existing upper-air station for a low-resolution GBON. The red circle indicates 1000km radius. The Green Circle is surrounding the entirety of St. Lucia.



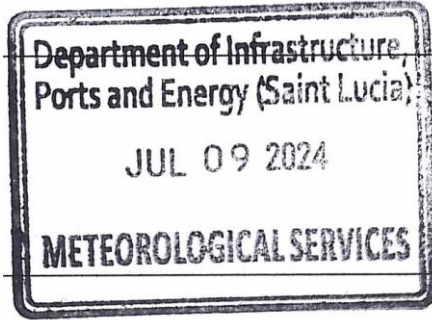
#### 4. Report completion signatures

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