Systematic Observations Financing Facility

Sixth Steering Committee
27 November 2023

WMO GBON Baseline 2023

INF 6.2

Systematic Observations
Financing Facility

Weather
and climate
data for
resilience

This document provides the updated GBON Baseline for June 2023 as requested by the Steering Committee through decision 5.7 and following entry into force of the GBON Technical Regulations on 1 January 2023 and the 19th World Meteorological Congress (22 May – 2 June 2023) consideration of GBON.

According to the new GBON Baseline from June 2023, Least Developed Countries (LDCs) and Small Island Developing States (SIDS) just have 9% of the required reporting surface stations, Lower Middle-Income Countries (LMICs) have 6% and Upper Middle-Income Countries (UMICs) 39% of the stations needed to be considered compliant. For the GBON upper-air target the countries classified as LDCs and SIDS meet 13% of the requirement for reporting stations, LMICs 41% while UMICs account for 64% of the required reporting upper-air stations.

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1. Background and additionality principle

WMO serves as SOFF Technical Authority and provides basic technical support to the SOFF peer advisors, implementing entities and beneficiary countries on GBON regulations. WMO is also responsible for the technical screening of the GBON Gap Analysis and the National Contribution Plans, and the independent verification of the status of beneficiary countries' stations against the GBON regulations.

The World Meteorological Congress is responsible for setting and approving the GBON regulations and updating them. The Commission for Observation, Infrastructure, and Information Systems (INFCOM) is in charge of overseeing and coordinating the development of technical guidelines, processes and procedures for the implementation and compliance monitoring of GBON.

According to the SOFF Operational Manual, SOFF is guided by the principle of Additionality: "An intervention may be described as additional if it results in something that would not otherwise have occurred."

SOFF support is limited to stations that were not GBON-compliant at the time of the WMO GBON Global Gap Analysis (see Steering Committee Decision 5.5). WMO conducted an updated Global GBON Gap Analysis as of June 2023, following entry into force of the GBON Technical Regulations on 1 January 2023, and the 19th World Meteorological Congress (22 May – 2 June 2023) and its consideration of GBON. With this document WMO presents this baseline to the SOFF 6th Steering Committee meeting. The 2023 GBON baseline will be publicly available on the SOFF website, thus ensuring complete transparency and open exchange of information on the status of all stations of SOFF beneficiary countries.

2. GBON compliance criteria for Gap Analyses 2022 and 2023

All SOFF activities and results are strictly guided by the GBON requirements, the GBON compliance criteria and the monitoring provided by the WIGOS Data Quality Monitoring System (WDQMS). SOFF uses the GBON compliance criteria applicable to all WMO Members (193 states and territories) as the basis to plan and implement activities and monitor and verify results. The WMO Technical Authority is responsible for the tools to monitor GBON compliance. Monitoring and data collection are entirely based on the WDQMS. The GBON compliance criteria are defined in the GBON Guide which was approved by the 76th WMO Executive Council (EC-76) and in the WIGOS Manual (WMO-No. 1160).

The "shall" and "should" provisions for the GBON requirements for different types of observing stations are summarised in Table 2.1 in the GBON guide document and were adopted by the 19th World Meteorological Congress (22 May – 2 June 2023). The "shall" provisions (Table 1) refer to the minimum horizontal resolutions, 200 km for surface land stations and 500 km for upper-air stations operated from land (500 km/ 1000 km for Small Island States respectively). These are the minimum horizontal resolution requirements the Members commit to implement and share their stations' data internationally to be considered GBON compliant. SOFF supports the standard density requirements for the horizontal resolution of stations inside a beneficiary country, with certain flexibility (see section 2.2). Furthermore, the GBON Guide sets the variables that are measured by the respective stations as well as the required frequency of international data sharing for a country to be GBON compliant. While a hundred percent GBON Compliance for a surface land station requires data sharing once an hour, a station is still

considered compliant if it shares data only 80% of the time. The number of late or rejected reports cannot be higher than 5 %. Moreover, for an upper-air station operated from land, the GBON requirements are two soundings per day.

Table 1: GBON horizontal resolution requirements for different types of observing stations for "shall" provisions, differentiating between Small Island States and "Standard" sized countries.

	Horizontal resolution (r_h)	
	Standard	**Small Island State**
Surface land stations	200 km	500 km
Upper-air stations operated from land	500 km	1000 km

2.1. WMO GBON Global Gap Analysis January 2022 and GBON Baseline June 2023

While the aforementioned GBON Compliance criteria were not in effect yet during the creation and distribution of the GBON Global Gap Analysis in January 2022, the criteria which were initially chosen to evaluate the "compliance" of stations and members were defined as the following: A station was compliant/reporting if based on the WDQMS in January 2022 the stations were either green (GBON compliant) or orange (potentially GBON compliant) on at least 60% of the days. Green stations are stations where the report availability is ≥ 80% and for orange stations the availability is ≥ 30%.

For the GBON baseline 2023 the WMO compliance criteria confirmed by EC-76 are the benchmark for the GBON Gap analysis. Hence, a station is considered compliant/ reporting if it reported 80% of the required reports on at least 80% of the days in June 2023.

2.2. Flexibility

According to the provisions in Decision 5.7 of the SOFF Steering Committee, SOFF is supporting the number of country stations needed to comply with the GBON standard practices (see horizontal resolution table 1). The SOFF Secretariat together with the WMO as its Technical Authority can consider requests of beneficiary countries for support of a number of stations that goes beyond the standard horizontal resolution requirement. These requests can be based on the countries' justified needs to achieve adequate horizontal resolution for GBON. The SOFF Steering Committee will consider these requests when approving the beneficiary countries funding requests.

3. WMO GBON Global Gap Analysis June 2023 results

The SOFF Steering Committee at its fifth meeting in June 2023 requested that the SOFF Secretariat "*prepare a proposal for how SOFF could maximize its impact – including as a foundational element and delivery vehicle of the UN Early Warnings for All initiative – through a phased and prioritized expansion of SOFF investment and compliance support to Middle-Income Countries for consideration and adoption at the 6th SOFF Steering Committee meeting.*"

Therefore, countries broken down by Small Island Developing States (SIDS) and Least Developed Countries (LDCS), Lower Middle-Income Countries (LMICs) and Upper Middle-Income Countries (UMICs) are assessed for the GBON surface and upper-air standard density compliance based on the WMO GBON Global Gap Analysis from June 2023.

3.1. Compliance maps

Figure 1- 4 show the GBON target compliance of surface land stations and upper-air stations according to the new and stricter GBON compliance globally, but taking into consideration all stations[1], (Figure 1) and separated by the according country classification (Figures 2-3).

The data analysis in section 4.2 shows that assessing compliance according to the new and stricter GBON compliance criteria has a major impact on the surface station compliance of a big group of countries. These countries would have been compliant with the criteria of the WMO Global Gap Analysis 2022, but do not have the required reporting frequency of at least 80% of hourly reports on 80% of the days in June. This can be observed in Figures 3 and 4 but as well in the global map in Figure 1. All maps visualise that there is a need to improve coverage across the globe to achieve GBON surface as well as upper-air compliance.

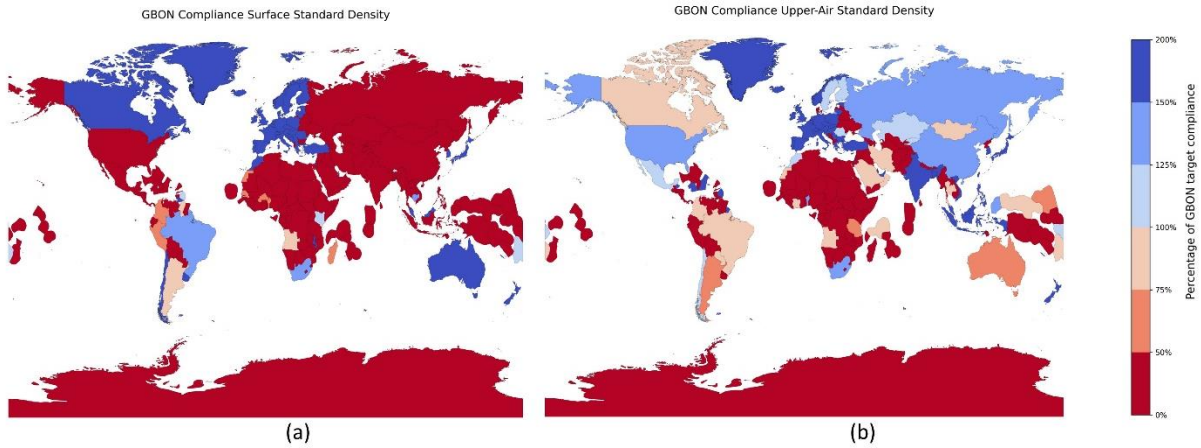


Figure 1: Global GBON target compliance of surface (a) and upper-air stations (b) evaluated according to WMO GBON standard density compliance criteria (80% report availability, 80% of days). The colour indicates how much of the GBON target number of reporting stations the respective countries are meeting (member compliance). Source: SOFF Secretariat and WMO Global GBON Gap Analyisis, June 2023.

Figure 2 shows that the GBON compliance in LDCs and SIDS is very low. The majority of the African LDCs and SIDS as well as most Pacific Islands are not GBON Compliant for the surface as well as for the upper-air station requirements.

[1] WMO GBON compliance criteria additionally require a station being designated as a GBON station. The rationale for considering all stations is that the Gap numbers in the present paper should represent required SOFF investments.

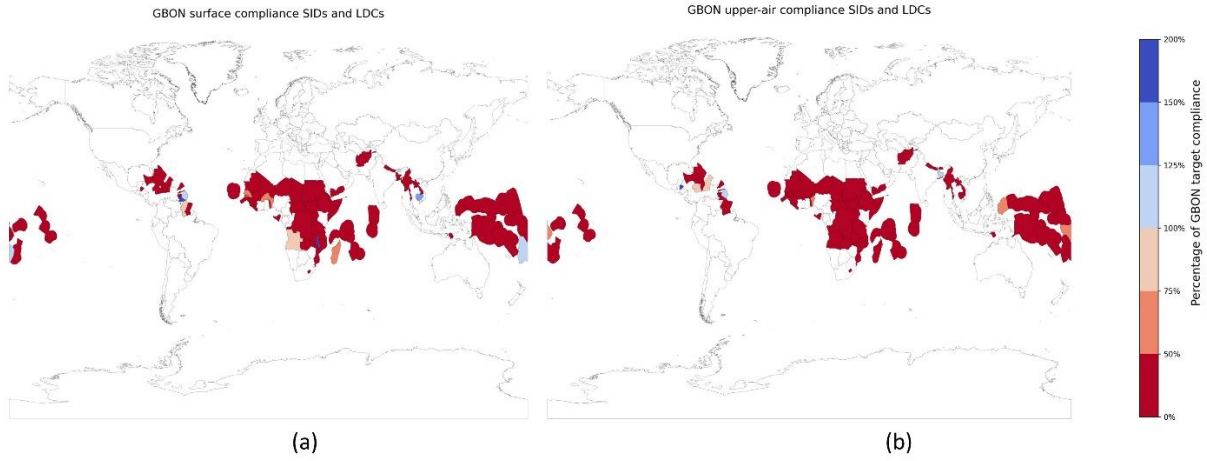


Figure 2: GBON target compliance of surface (a) and upper-air stations (b) evaluated according to WMO GBON standard density compliance criteria, for SIDS and LDCs (80% report availability, 80% of days). The colour indicates how much of the GBON target number of reporting stations the respective countries are meeting (member compliance). Source: SOFF Secretariat and WMO Global GBON Gap Analyisis, June 2023.

Figures 3 and 4 show that even for LMICs and UMICs, there are significant issues with GBON compliance, and a large share of these countries have less than 50% of the required target number of GBON compliant surface – or upper-air stations.

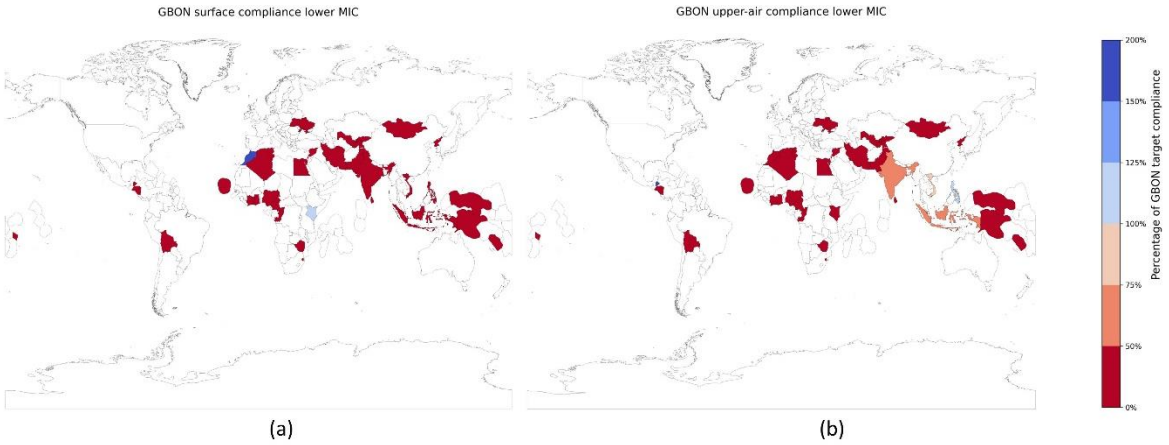


Figure 3: GBON target compliance of surface (a) and upper-air stations (b) evaluated according to WMO GBON standard density compliance criteria, for lower MICs (80% report availability, 80% of days). The colour indicates how much of the GBON target number of reporting stations the respective countries are meeting (member compliance). Source: SOFF Secretariat and WMO Global GBON Gap Analyisis, June 2023.

Figure 4: GBON target compliance of surface (a) and upper-air stations (b) evaluated according to WMO GBON standard density compliance criteria, for upper MICs (80% report availability, 80% of days). The colour indicates how much of the GBON target number of reporting stations the respective countries are meeting (member compliance). Source: SOFF Secretariat and WMO Global GBON Gap Analyisis, June 2023.

3.2. Data Analysis

This section analyses and evaluates the GBON Gap Analysis from June 2023 for the respective regions, country characterizations and investment needs for new or improvable stations.

Table 2 shows the GBON Global Gap analysis for surface and upper-air stations for June 2023 per country classification in station numbers. The "target" refers to the number of stations that countries need to operate to be GBON compliant, "new" stations are surface or upper-air stations that need to be newly installed and "improve" are stations that already exist but appear that they could be rehabilitated. The total gap refers to the sum of the stations that need to be newly installed or improved to comply with GBON criteria for the respective countries to be GBON compliant.

The total surface station Gap of LDCs and SIDS makes out approximately 36% of the total GBON surface station Gap of the 149 countries that are considered either LDCs, SIDS, LMICS or UMICS. The according GBON surface station Gap of the LMICs and UMICs are 29% and 35% respectively. The GBON upper-air station Gap of the LDCs and SIDS of the aforementioned country classficiation groups of 149 countries, sums up to 53%, while the LMICs and UMICs have an upper-air gap share of 22% and 25% respectively.

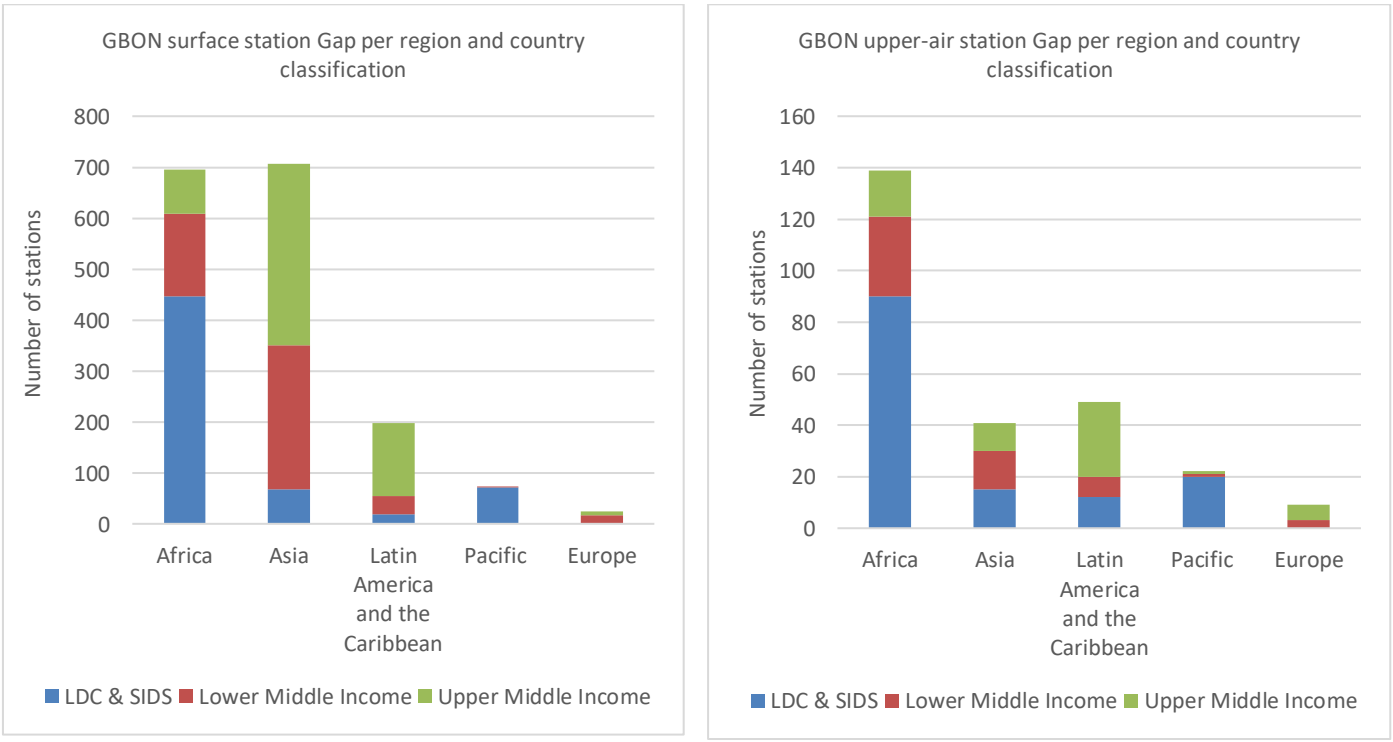
Furthermore, according to the new GBON compliance criteria, LDCs and SIDS just have 9% of the required reporting surface land stations, LMICs have 6% and UMICs 39% of the stations needed to be considered compliant. For the GBON upper-air target the countries classified as LDCs and SIDS meet 13% of the requirement for reporting stations, LMICs 41% while UMICs can account for 64% of the required reporting upper-air stations for compliance with GBON upper-air requirements.

Table 2: GBON Global Gap analysis from June 2023 for surface and upper-air stations per country classification in station numbers

	Number of countries	Surface stations		Upper air stations	
		Target	Gap	Target	Gap

			Total	New	Improve		Total	New	Improve
		Number of stations							
LDCs and SIDS	77	661	604	118	486	158	137	92	45
Lower Middle Income and Lower Income (without SIDS)	32	527	497	2	495	99	58	16	42
Upper Middle Income (without SIDS)	40	967	594	22	572	180	65	34	31
TOTAL	149	2155	1695	142	1553	437	260	142	118

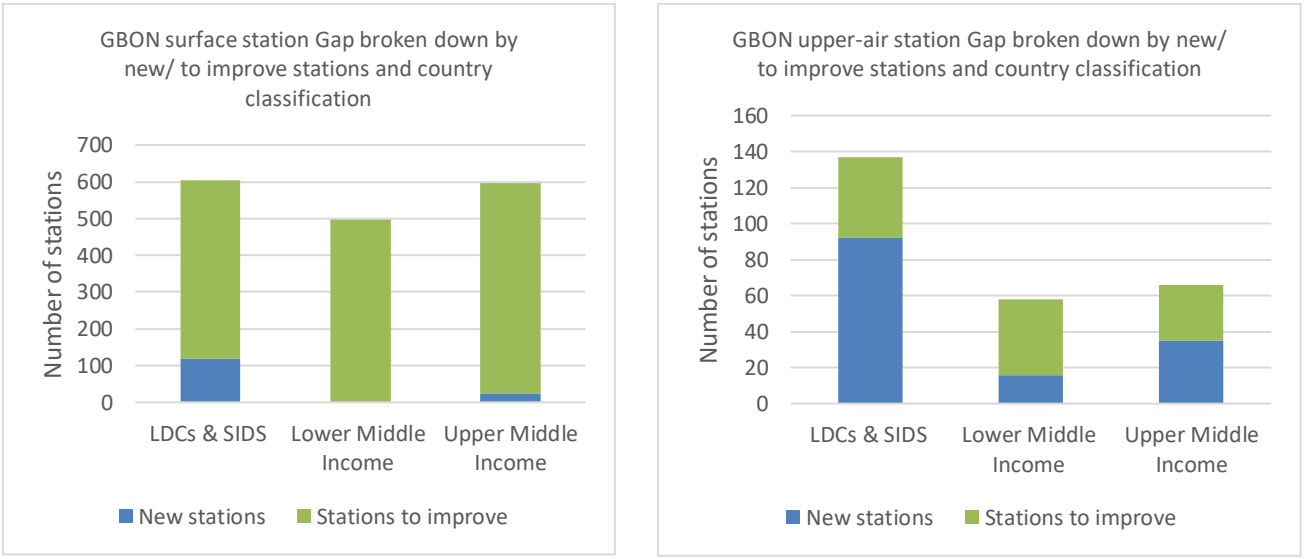
Figure 5 shows the GBON Gap data from June 2023 in station numbers, (a) for surface stations and (b) for upper-air stations. The data is broken down by region and country classification. The GBON surface station Gap in Africa and Asia is equally big with about 700 missing compliant stations respectively for SIDS&LDCs, LMICs and UMICs. In Africa, SIDS&LDCS constitute two third of the GBON Gap. In Asia, the major share of the GBON Gap is in MICs. Furthermore, the GBON upper-air station Gap in Africa is larger than the Gap in all other regions combined.



(a) (b)

Figure 5: GBON Global Gap data for June 2023 for surface (a) and upper-air (b) stations per region and country classification in number of stations.

Figure 6 shows the GBON Gap of surface (a) and upper-air (b) stations broken down by country classification and by whether a station needs to be improved or newly installed. It can be observed that while the GBON surface station Gap consists largely of stations that need to be improved, a large number of new upper-air stations is required to close the GBON upper-air Gap, especially in LDCs and SIDS, but also in MICs. Stations that can be improved are stations that are either registered in OSCAR/Surface and not share data – or share data but not enough to be compliant with the GBON regulations explained in section 3. OSCAR/Surface is the World Meteorological Organization's official repository of the WMO Integrated Global Observing System (WIGOS) metadata for all surface-based observing stations and platforms.

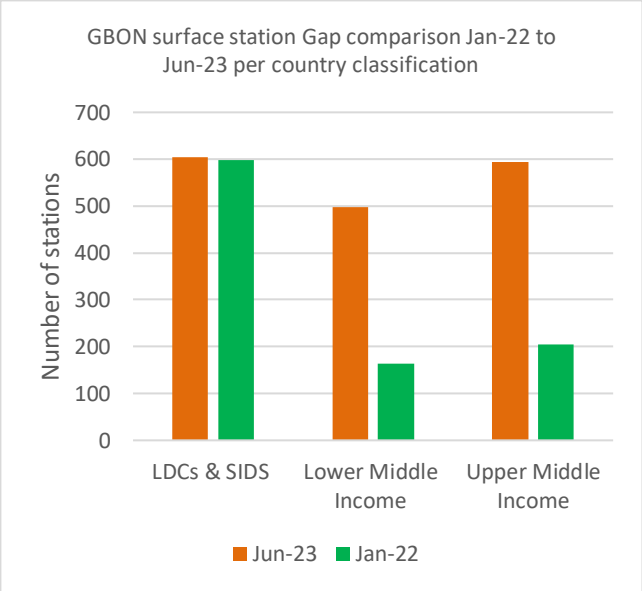


(a) (b)

Figure 6: GBON Global Gap data for June 2023 in station numbers for surface (a) and upper-air (b) separated by stations that need to be newly installed and stations that need to be improved

Figure 7 shows the difference between the WMO GBON Global Gap Analysis in January 2022 and the Gap Analysis for June 2023 of GBON surface (a) and upper-air (b) station Gap for the respective country classifications. The biggest increase of the GBON surface Gap numbers is in Lower - and Upper Middle-Income Countries. This can be explained by the newly introduced GBON compliance criteria (section 3.1) which require 80% of reports instead of the 30% used in the Global Gap Analysis. While manually operated stations were still considered reporting in January 2022, the reporting frequency of these stations are not enough to meet the GBON compliance criteria. The residual surface station Gaps for LDCS and SIDS as well as the upper-air station Gaps for all country classifications have not shown significant changes. These Gap numbers indicate that the number of reporting observations had already not been sufficient in January 2022 and that the stricter criteria therefore did not change the Gap numbers notably.

The raw numbers of GBON Gap Analysis for June 2023 for the first three SOFF batches can be found in Annex 1 and the respective explanations can be found in Annex 2.



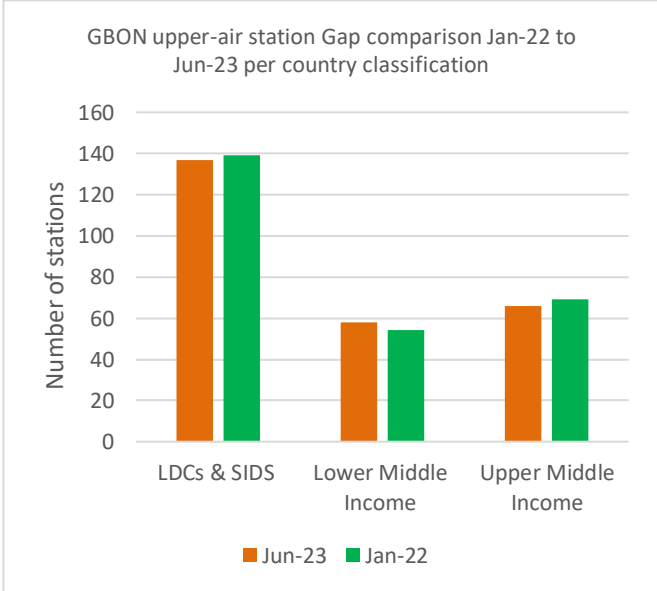


Figure 7: GBON Global Gap data comparison for January 2022 and June 2023 in station numbers per country classifications. The compliance criteria for the January 2022 data was: Report availability of ≥ 30% on ≥ 60% of the days and for June 2023 the GBON compliance criteria were valid: ≥ 80% of report availability on ≥ 80% of the days.

Annex 1: GBON Global Gap Analysis for the 59 countries with approved Readiness Funding Requests.

		2022					2023				
First and second SOFF Batch	*Station type*	*Target*	*Reporting**	*Gap (improve)*	*Gap (new)*	*Gap (total)*	*Target*	*Reporting***	*Gap (improve)*	*Gap (new)*	*Gap (total)*
WMO Member: **Belize**	GBON Surface Land stations (standard density)	1	1	0	0	0	1	0	1	0	1
	GBON Surface Land stations (high density)	1	1	0	0	0	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	1	0	1	1	1	0	0	0
WMO Member: **Bhutan**	GBON Surface Land stations (standard density)	1	0	1	0	1	1	1	0	0	0
	GBON Surface Land stations (high density)	4	0	1	3	4	4	1	0	3	3
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Burkina Faso**	GBON Surface Land stations (standard density)	7	8	0	0	0	7	2	5	0	5
	GBON Surface Land stations (high density)	28	8	20	0	20	28	2	8	18	26
	GBON Upper-Air stations over land	2	0	0	2	2	2	0	1	1	2
WMO Member: **Cambodia**	GBON Surface Land stations (standard density)	5	0	5	0	5	5	9	0	0	0
	GBON Surface Land stations (high density)	19	0	10	9	19	19	9	10	0	10
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Cabo Verde**	GBON Surface Land stations (standard density)	4	0	4	0	4	4	0	4	0	4
	GBON Surface Land stations (high density)	4	0	4	0	4	4	0	4	0	4
	GBON Upper-Air stations over land	1	0	1	0	1	1	0	1	0	1
WMO Member: **Chad**	GBON Surface Land stations (standard density)	33	2	11	20	31	33	1	32	0	32
	GBON Surface Land stations (high density)	129	2	11	116	127	129	1	63	65	128
	GBON Upper-Air stations over land	6	0	2	4	6	6	0	2	4	6
WMO Member: **Democratic Republic of the Congo**	GBON Surface Land stations (standard density)	59	0	30	29	59	59	0	35	24	59
	GBON Surface Land stations (high density)	235	0	30	205	235	235	0	35	200	235
	GBON Upper-Air stations over land	10	0	0	10	10	10	0	0	10	10
WMO Member: **Ecuador**	GBON Surface Land stations (standard density)	7	0	7	0	7	7	0	7	0	7
	GBON Surface Land stations (high density)	26	0	26	0	26	26	0	26	0	26
	GBON Upper-Air stations over land	2	0	2	0	2	2	0	2	0	2
WMO Member: **Ethiopia**	GBON Surface Land stations (standard density)	29	0	17	12	29	29	0	29	0	29
	GBON Surface Land stations (high density)	114	0	17	97	114	114	0	48	66	114
	GBON Upper-Air stations over land	5	0	1	4	5	5	0	1	4	5
WMO Member: **Fiji**	GBON Surface Land stations (standard density)	6	9	0	0	0	6	7	0	0	0
	GBON Surface Land stations (high density)	6	9	0	0	0	6	7	0	0	0
	GBON Upper-Air stations over land	2	1	0	1	1	2	1	0	1	1
WMO Member: **Grenada**	GBON Surface Land stations (standard density)	1	1	0	0	0	1	1	0	0	0
	GBON Surface Land stations (high density)	1	1	0	0	0	1	1	0	0	0
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Guinea-Bussau**	GBON Surface Land stations (standard density)	1	0	1	0	1	1	0	1	0	1
	GBON Surface Land stations (high density)	1	0	1	0	1	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Guyana**	GBON Surface Land stations (standard density)	2	0	2	0	2	2	1	1	0	1
	GBON Surface Land stations (high density)	2	0	2	0	2	2	1	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Kiribati**	GBON Surface Land stations (standard density)	14	2	6	6	12	14	0	8	6	14
	GBON Surface Land stations (high density)	14	2	6	6	12	14	0	8	6	14
	GBON Upper-Air stations over land	4	1	1	2	3	4	0	2	2	4
WMO Member: **Lao People's Democratic Republic**	GBON Surface Land stations (standard density)	6	2	4	0	4	6	0	6	0	6
	GBON Surface Land stations (high density)	24	2	18	4	22	24	0	20	4	24
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Liberia**	GBON Surface Land stations (standard density)	3	0	1	2	3	3	0	3	0	3
	GBON Surface Land stations (high density)	12	0	1	11	12	12	0	3	9	12
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Madagascar**	GBON Surface Land stations (standard density)	15	4	11	0	11	15	4	11	0	11
	GBON Surface Land stations (high density)	59	4	19	36	55	59	4	19	36	55
	GBON Upper-Air stations over land	3	0	2	1	3	3	0	3	0	3
WMO Member: **Malawi**	GBON Surface Land stations (standard density)	3	4	0	0	0	3	10	0	0	0
	GBON Surface Land stations (high density)	12	4	8	0	8	12	10	2	0	2
	GBON Upper-Air stations over land	1	0	1	0	1	1	0	1	0	1
WMO Member: **Maldives**	GBON Surface Land stations (standard density)	4	5	0	0	0	4	0	4	0	4
	GBON Surface Land stations (high density)	4	5	0	0	0	4	0	4	0	4
	GBON Upper-Air stations over land	1	0	1	0	1	1	0	1	0	1
WMO Member: **Mozambique**	GBON Surface Land stations (standard density)	20	5	15	0	15	20	0	20	0	20
	GBON Surface Land stations (high density)	80	5	73	2	75	80	0	65	15	80
	GBON Upper-Air stations over land	4	0	2	2	4	4	0	0	4	4
WMO Member: **Nauru**	GBON Surface Land stations (standard density)	2	0	1	1	2	2	0	1	1	2
	GBON Surface Land stations (high density)	2	0	1	1	2	2	0	1	1	2
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Nepal**	GBON Surface Land stations (standard density)	4	1	3	0	3	4	0	4	0	4
	GBON Surface Land stations (high density)	15	1	14	0	14	15	0	15	0	15
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Papua New Guinea**	GBON Surface Land stations (standard density)	12	0	12	0	12	12	0	12	0	12
	GBON Surface Land stations (high density)	12	0	12	0	12	12	0	12	0	12
	GBON Upper-Air stations over land	3	0	2	1	3	3	0	2	1	3
WMO Member: **Rwanda**	GBON Surface Land stations (standard density)	1	0	1	0	1	1	0	1	0	1
	GBON Surface Land stations (high density)	3	0	3	0	3	3	0	3	0	3
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Samoa**	GBON Surface Land stations (standard density)	1	1	0	0	0	1	0	1	0	1
	GBON Surface Land stations (high density)	1	1	0	0	0	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Sao Tome and Principe**	GBON Surface Land stations (standard density)	1	0	1	0	1	1	0	1	0	1
	GBON Surface Land stations (high density)	1	0	1	0	1	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Senegal**	GBON Surface Land stations (standard density)	5	0	5	0	5	5	2	3	0	3
	GBON Surface Land stations (high density)	20	0	13	7	20	20	2	12	6	18
	GBON Upper-Air stations over land	1	1	0	0	0	1	0	1	0	1
WMO Member: **Solomon Islands**	GBON Surface Land stations (standard density)	7	2	5	0	5	7	0	6	1	7
	GBON Surface Land stations (high density)	7	2	5	0	5	7	0	6	1	7
	GBON Upper-Air stations over land	2	0	1	1	2	2	0	1	1	2

WMO Member: **South Sudan**	GBON Surface Land stations (standard density)	16	0	2	14	16	16	0	2	14	16
	GBON Surface Land stations (high density)	64	0	2	62	64	64	0	2	62	64
	GBON Upper-Air stations over land	3	0	0	3	3	3	0	0	3	3
WMO Member: **Tanzania**	GBON Surface Land stations (standard density)	24	0	16	8	24	24	0	16	8	24
	GBON Surface Land stations (high density)	95	0	16	79	95	95	0	16	79	95
	GBON Upper-Air stations over land	4	0	3	1	4	4	1	2	1	3
WMO Member: **Timor-Leste**	GBON Surface Land stations (standard density)	1	0	1	0	1	1	0	1	0	1
	GBON Surface Land stations (high density)	1	0	1	0	1	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Tonga**	GBON Surface Land stations (standard density)	3	0	3	0	3	3	0	3	0	3
	GBON Surface Land stations (high density)	3	0	3	0	3	3	0	3	0	3
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Tuvalu**	GBON Surface Land stations (standard density)	4	1	3	0	3	4	0	4	0	4
	GBON Surface Land stations (high density)	4	1	3	0	3	4	0	4	0	4
	GBON Upper-Air stations over land	1	0	1	0	1	1	1	0	0	0
WMO Member: **Uganda**	GBON Surface Land stations (standard density)	7	0	7	0	7	7	0	7	0	7
	GBON Surface Land stations (high density)	25	0	11	14	25	25	0	12	13	25
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Vanuatu**	GBON Surface Land stations (standard density)	3	4	0	0	0	3	0	3	0	3
	GBON Surface Land stations (high density)	3	4	0	0	0	3	0	3	0	3
	GBON Upper-Air stations over land	1	0	1	0	1	1	0	1	0	1
WMO Member: **Zambia**	GBON Surface Land stations (standard density)	19	0	19	0	19	19	0	19	0	19
	GBON Surface Land stations (high density)	76	0	76	0	76	76	0	46	30	76
	GBON Upper-Air stations over land	4	0	1	3	4	4	0	4	0	4

* Stations with data availability more than 30% in the WDQMS Webtool as of January 2022 at least 60% of days

** Stations with data availability more than 80% in the WDQMS Webtool as of June 2023 at least 80% of days

		2022					2023				
	Station type	*Target*	*Reporting**	*Gap (improve)*	*Gap (new)*	*Gap (total)*	*Target*	*Reporting***	*Gap (improve)*	*Gap (new)*	*Gap (total)*
WMO Member: **Antigua and Barbuda**	GBON Surface Land stations (standard density)	1	1	0	0	0	1	0	1	0	1
	GBON Surface Land stations (high density)	1	1	0	0	0	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Bahamas**	GBON Surface Land stations (standard density)	3	0	3	0	3	3	0	3	0	3
	GBON Surface Land stations (high density)	3	0	3	0	3	3	0	3	0	3
	GBON Upper-Air stations over land	1	0	1	0	1	1	0	1	0	1
WMO Member: **Bangladesh**	GBON Surface Land stations (standard density)	4	27	0	0	0	4	0	4	0	4
	GBON Surface Land stations (high density)	15	27	0	0	0	15	0	15	0	15
	GBON Upper-Air stations over land	1	4	0	0	0	1	4	0	0	0
WMO Member: **Barbados**	GBON Surface Land stations (standard density)	1	1	0	0	0	1	1	0	0	0
	GBON Surface Land stations (high density)	1	1	0	0	0	1	1	0	0	0
	GBON Upper-Air stations over land	1	1	0	0	0	1	1	0	0	0
WMO Member: **Comoros**	GBON Surface Land stations (standard density)	1	1	0	0	0	1	0	1	0	1
	GBON Surface Land stations (high density)	1	1	0	0	0	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Cuba**	GBON Surface Land stations (standard density)	2	1	1	0	1	2	0	2	0	2
	GBON Surface Land stations (high density)	2	1	1	0	1	2	0	2	0	2
	GBON Upper-Air stations over land	1	0	1	0	1	1	0	1	0	1
WMO Member: **Djibouti**	GBON Surface Land stations (standard density)	1	0	1	0	1	1	0	1	0	1
	GBON Surface Land stations (high density)	3	0	1	2	3	3	0	1	2	3
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Dominica**	GBON Surface Land stations (standard density)	1	0	1	0	1	1	0	1	0	1
	GBON Surface Land stations (high density)	1	0	1	0	1	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Dominican Republic**	GBON Surface Land stations (standard density)	2	0	2	0	2	2	0	2	0	2
	GBON Surface Land stations (high density)	2	0	2	0	2	2	0	2	0	2
	GBON Upper-Air stations over land	1	1	0	0	0	1	1	0	0	0
WMO Member: **Federated States of Micronesia**	GBON Surface Land stations (standard density)	13	0	13	0	13	13	0	13	0	13
	GBON Surface Land stations (high density)	13	0	13	0	13	13	0	13	0	13
	GBON Upper-Air stations over land	4	3	0	1	1	4	2	1	1	2
WMO Member: **Jamaica**	GBON Surface Land stations (standard density)	2	2	0	0	0	2	0	2	0	2
	GBON Surface Land stations (high density)	2	2	0	0	0	2	0	2	0	2
	GBON Upper-Air stations over land	1	1	0	0	0	1	1	0	0	0
WMO Member: **Marshall Islands**	GBON Surface Land stations (standard density)	9	0	7	2	9	9	0	7	2	9
	GBON Surface Land stations (high density)	9	0	7	2	9	9	0	7	2	9
	GBON Upper-Air stations over land	3	2	0	1	1	3	1	1	1	2
WMO Member: **Mauritius**	GBON Surface Land stations (standard density)	9	0	6	3	9	9	1	5	3	8
	GBON Surface Land stations (high density)	9	0	6	3	9	9	1	5	3	8
	GBON Upper-Air stations over land	3	0	1	2	3	3	0	1	2	3
WMO Member: **Niger**	GBON Surface Land stations (standard density)	32	0	15	17	32	32	0	31	1	32
	GBON Surface Land stations (high density)	127	0	15	112	127	127	0	31	96	127
	GBON Upper-Air stations over land	6	1	1	4	5	6	1	1	4	5
WMO Member: **Palau**	GBON Surface Land stations (standard density)	3	0	2	1	3	3	0	2	1	3
	GBON Surface Land stations (high density)	3	0	2	1	3	3	0	2	1	3
	GBON Upper-Air stations over land	1	1	0	0	0	1	1	0	0	0
WMO Member: **Saint Kitts and Nevis**	GBON Surface Land stations (standard density)	1	0	1	0	1	1	0	1	0	1
	GBON Surface Land stations (high density)	1	0	1	0	1	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Saint Lucia**	GBON Surface Land stations (standard density)	1	1	0	0	0	1	0	1	0	1
	GBON Surface Land stations (high density)	1	1	0	0	0	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Saint Vincent and Grenadines**	GBON Surface Land stations (standard density)	1	0	0	1	1	1	0	1	0	1
	GBON Surface Land stations (high density)	1	0	0	1	1	1	0	1	0	1
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Seychelles**	GBON Surface Land stations (standard density)	6	1	0	5	5	6	0	1	5	6
	GBON Surface Land stations (high density)	6	1	0	5	5	6	0	1	5	6
	GBON Upper-Air stations over land	2	1	0	1	1	2	1	0	1	1
WMO Member: **Somalia**	GBON Surface Land stations (standard density)	16	0	16	0	16	16	0	16	0	16
	GBON Surface Land stations (high density)	64	0	16	48	64	64	0	22	42	64
	GBON Upper-Air stations over land	3	0	0	3	3	3	0	0	3	3
WMO Member: **Suriname**	GBON Surface Land stations (standard density)	2	1	1	0	1	2	0	2	0	2
	GBON Surface Land stations (high density)	2	1	1	0	1	2	0	2	0	2
	GBON Upper-Air stations over land	1	0	0	1	1	1	0	0	1	1
WMO Member: **Tajikistan**	GBON Surface Land stations (standard density)	4	24	0	0	0	4	0	4	0	4
	GBON Surface Land stations (high density)	15	24	0	0	0	15	0	15	0	15
	GBON Upper-Air stations over land	1	0	1	0	1	1	0	1	0	1
WMO Member: **Trinidad and Tobago**	GBON Surface Land stations (standard density)	1	2	0	0	0	1	2	0	0	0
	GBON Surface Land stations (high density)	1	2	0	0	0	1	2	0	0	0
	GBON Upper-Air stations over land	1	0	1	0	1	1	0	1	0	1

* Stations with data availability more than 30% in the WDQMS Webtool as of January 2022 at least 60% of days

** Stations with data availability more than 80% in the WDQMS Webtool as of June 2023 at least 80% of days

This data covers the SOFF countries eligible for investment support at this time, underlying data is available for all countries.

Annex 2 : Explanation GBON Global Gap Analysis June 2023

Notes:

1. The rationale for classifying stations as reporting is based on the WIGOS Data Quality Monitoring System (WDQMS) for June 2023. Stations that were green (GBON Compliant on at least 80% of days of the month, are considered as reporting). Other listed stations are counted as having the possibility to be improved.

2. "Standard density" refers to the GBON regulation for horizontal resolution of surface land stations, with 200 km maximum spacing between stations, and which applies to all Members (except SIDS, see Caveat 2)

Caveat:

1. "Number of stations to be improved" is the number of stations that could a priori be improved to meet GBON requirements, for example by increasing the number of shared observations.

2. For SIDS, the EEZ area were added to the total surface area which is the basis for the target number of stations.

3. The surface area was computed based on a geographic information system model and may slightly deviate from official records.

4. For WMO Members having more than one geographic area, the numbers for gap (total) are added up for each of the geographic areas. This means that the gap (total) can be greater than the difference between the number of target and reporting stations.