



**Working Group 2 Tsunami Detection, Analysis and Forecasting
IOC Intergovernmental Coordination Group for the Tsunami and
Other Coastal Hazards Warning System for the Caribbean and
Adjacent Regions**

CARIBE EWS SEA LEVEL DATA AVAILABILITY

2024 Report

[Abstract](#)

Report of coastal sea level stations and DARTs contributing to the CARIBE EWS in 2024. In December 2024, of the 198 stations in the CARIBE-EWS sea level inventory, data from 88 were available in support of tsunami warning.

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Summary

Real-time sea level data is one of the essential data streams of a tsunami warning system. Tsunami Warning Centers use seismic data to determine whether there is potential for a tsunami threat following an earthquake. Sea level data are used to detect and confirm the tsunami generation, help forecast its severity, and declare the threat is over. In the case of tsunamis generated by a non-seismic source, the sea level data will be the primary tool for the detection and evaluation of the threat. The main types of sea level data used to detect tsunamis are coastal sea level stations and tsunameters (DARTs).

Since 2010, at the request of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS), the Caribbean Office of the International Tsunami Information Center has maintained an inventory of the sea level stations used for tsunami monitoring and warning in the region. It shares and posts monthly maps on the status of sea level data from the Pacific Tsunami Warning Center, periodically updates and posts the inventory of stations and their status, and produces an annual report on sea level stations and data availability.

For this report, data availability is reported from the UNESCO/IOC Sea Level Station Monitoring Facility (SLMF) for the coastal sea level stations and most recently, DART stations. The data availability at the NOAA National Data Buoy Center is reported in the case of the DARTs and at the Pacific Tsunami Warning Center, as the designated Tsunami Service Provider for the CARIBE EWS, for both DART and coastal sea level stations.

In this report, some stations in Brazil were added, and the Barbados Meteorological Services started sharing their station's information. Barometric Pressure information was also added to the report as an additional column which indicates if there is barometric pressure information available for that station.

In December 2023, of the 198 stations in the CARIBE-EWS sea level inventory, 88 were contributing data in near real-time for tsunami warnings. This includes 7 of the 11 DART stations. In contrast, in December 2022 there were a total of 184 stations and 68 contributing.

Introduction

Since 2010, the International Tsunami Information Center Caribbean Office (ITIC-CAR), previously called the Caribbean Tsunami Warning Program, CTWP, has been reviewing the status of seismic and sea level stations contributing to the CARIBE EWS. In 2021, it transitioned from preparing monthly to biannual reports on the status of coastal sea level stations and DARTs. The PTWC also prepares monthly maps on sea level data availability at their center and ITIC-CAR has posted these on iticcar.org as well as shared with CARIBE EWS WG2 and operators of sea level stations.

At its Fourteenth Session, the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, (ICG/CARIBE EWS-XIV) in its recommendation ICG/CARIBE-EWS-XIV.2 on Tsunami Monitoring and Detection Systems:

- Requested CTWP to continue producing up to date maps and data availability reports based on current sea level and seismic stations contributing to the CARIBE-EWS.

Furthermore, at its Fifteenth Session, which took place online on 27–29 April 2021, the ICG/CARIBE EWS-XV) in its Recommendation ICG/CARIBE-EWS-XV.1 on Tsunami Monitoring and the Systems:

- Appreciated the NOAA Caribbean Tsunami Warning Programme (CTWP) for improving the automated processing and reporting on the status of seismic and sea level stations
- Urged Member States and sea level station operators contributing to CARIBE-EWS to maintain their sea-level stations to an operational standard,
- Also urged Member States and sea level station operators to regularly review and update the status of sea level stations in the web pages of the IOC's Sea Level Station Monitoring Facility and in the CTWP reports prepared on behalf of the CARIBE-EWS,
- Recommended a survey of sea-level network operator status by WG1 and ITIC-CAR with the goal of improving the up time of the sea-level network,

The Sixteenth Session of the ICG/CARIBE-EWS took place from 25-28 April 2023 in San Jose, Costa Rica and was the first in person meeting since 2019. In its recommendation, ICG/CARIBE-EWS-XV:

- Revised the ICG-CARIBE Working Groups and Task Teams and changed them to:
 - Working Group 1: Tsunami Risk Knowledge
 - Working Group 2: Tsunami Detection Analysis and Forecasting
 - Working Group 3: Tsunami Warning Dissemination and Communication
 - Working Group 4: Tsunami Preparedness, Response and Mitigation
 - Task Team CARIBE WAVE
- Appreciated the International Tsunami Information Center Caribbean Office (ITIC-CAR) of the National Oceanographic and Atmospheric Agency (NOAA) and the Pacific Tsunami Warning Center (PTWC) for improving the processing and continued reporting on the status of seismic and sea level stations;
- Requested WG2 on Tsunami Detection, Analysis and Forecasting to review the status and effectiveness of the current reporting mechanism and propose at the Seventeenth Session of ICG/CARIBE-EWS (ICG/CARIBE-EWS-XVII) a model moving forward without ITIC-CAR support.
- Noted the rapid deployment of sea-level monitoring instrumentation in response to the tsunami hazard posed by the eruptive activity and potential pyroclastic flows of La Soufrière Volcano on Saint Vincent and Mt Pelée on Martinique;

- Further Noted that a high percentage of the stations in the CARIBE-EWS sea level network are currently non-operational and therefore can delay the proper assessment of tsunami events and the issuance of timely and accurate tsunami alerts;
- Appreciated the planned hosting of a five day Tides Training Course to be taught in Spanish for both oceanographic and hydrographic organizations jointly organized and funded by the International Hydrographic Organization (IHO), the International Maritime Organization (IMO), and the Intergovernmental Oceanographic Commission (IOC). The dates for this training will be 13-17 November 2023 and the venue will be located in Costa Rica;
- Urged Member States and operators of sea level stations contributing to ICG/CARIBE-EWS to maintain their sea-level stations in an operational status, regularly review and update the status of its stations in the IOC Sea Level Monitoring Facility, and inform ITIC-CAR and the Secretariat on plans for repair;
- Recommended a survey of sea-level network stations status updates by WG2 and ITIC-CAR with the goal of improving the uptime of sea-level network.
- Encouraged NOAA to rapidly repair two Deep-ocean Assessment and Reporting of Tsunami (DART) buoys that stopped transmitting data in 2022;
- Recommended that seismic and sea-level network operators seriously consider the experience from Hurricanes Harvey, Irma, Maria and Nate to increase the resilience of sea-level facilities to powerful hurricanes;

This report covers these recommendations.

Sea Level Stations Status Categories for 2023

In 2019, at the *Fourteenth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, (ICG/CARIBE EWS-XIV)* the status categories for sea level stations were updated to the following:

Contributing Real Time (Contributing RTX)

Also known as Active on the SLMF. Data from these stations have been available for the past month in real-time or near real-time through FTP or GTS (GOES), are accessible to tsunami service providers and tsunami warning centers, and can be accessed through Tide Tool, IOC SLMF, and other sites. For reports prepared through 2018, once a station was contributing in real time, it always remained with this status, irrespective of its operational status. There were stations that had not been contributing data in real-time for months or even years. These non-contributing stations are now classified as down, being consistent with the SLMF.

<i>Existing</i>	Stations that are understood to be operational through national reporting, GLOSS, or other mechanisms, but whose data are not shared and are not available in real-time or near real-time.
<i>Down</i>	These stations at one point were Contributing in Real Time but for a period of a month or longer have not been sharing data. There is the expectation that the data from the station will become available in the future.
<i>Planned</i>	Stations that Member States or Network Operators have indicated they have funding for and are in the process of acquisition or installation.
<i>Gap</i>	Station locations that the CARIBE EWS has indicated are of high priority but for which no funding has been identified for their acquisition, installation, and operation.
<i>Removed</i>	Stations that have been removed or relocated.
<i>Unknown</i>	Stations for which there is no data on their current operational status.

This classification was used for the 2023 biannual sea level reports as well as this report. Figure 1 shows the status of the 198 coastal stations in the inventory at the end of 2023. Graph 1 shows the biannual number of sea level stations from December 2020 through December 2023 for which data was contributing close to real time (Contributing RTX). According to the statistics, there has been an increase in the total number of Contributing RTX stations, from 68 stations contributing at the end of 2022 to 88 in December 2023. Graph 2 shows all the status categories used for each six-month term. The biannual reports/maps were also posted to the ITIC-CAR website (iticcar.org). Appendix A has a table with the status of all the stations as of December 2023.

For the Contributing Real-Time stations, the performance ratio statistics per station are based on the data from the UNESCO IOC Sea Level Monitoring Facility (SLMF), and the data from the Pacific Tsunami Warning Center (PTWC) was also used.

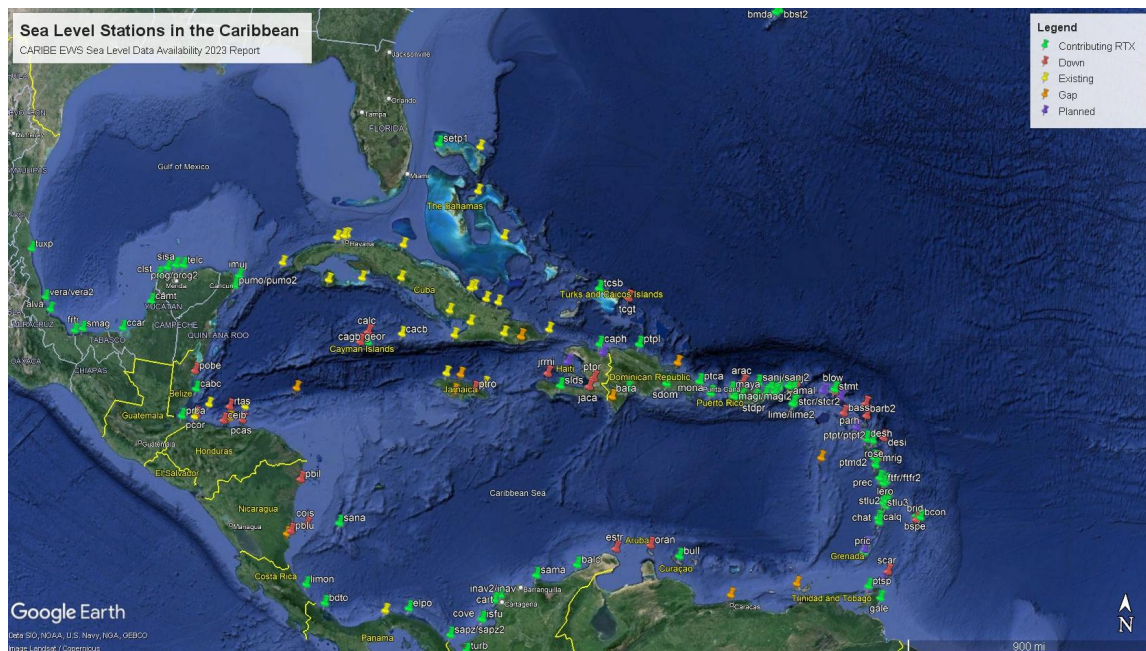
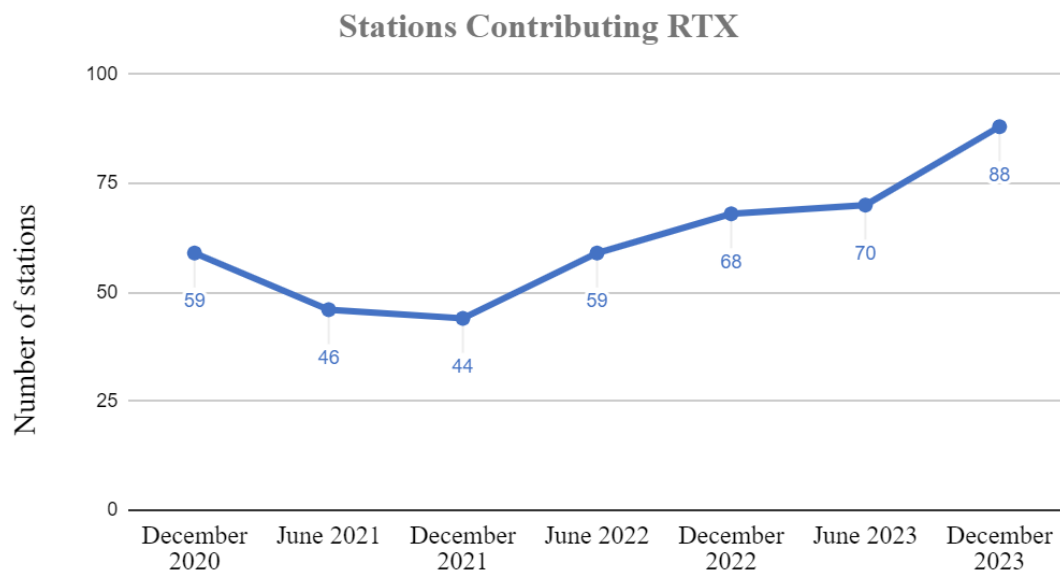
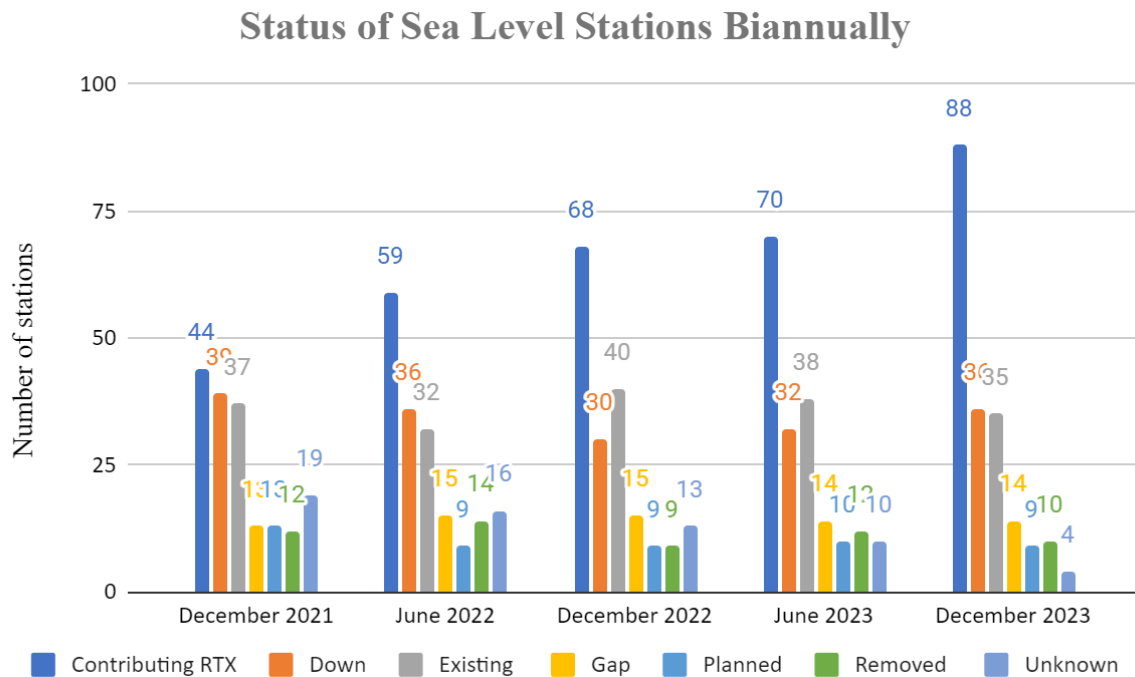


Figure 1. December 2023 Sea Level Stations Status.



Graph 1. Biannual variability of the number of Contributing RTX coastal sea level stations and DARTs from December 2020 through December 2023.



Graph 2. Station Status 2021-2023

UNESCO - Intergovernmental Oceanographic Commission (IOC) Sea Level Monitoring Facility (SLMF)

The objectives of this service are:

- to provide information about the operational status of global and regional networks of real-time sea level stations;
- to provide a display service for quick inspection of the raw data stream from individual stations.

This service and website (Figure 2) initially focused on the operational monitoring of sea level measuring stations in Africa and was developed in collaboration between Flanders Marine Institute (VLIZ) and the ODINAFRICA project of IODE. The site has since been expanded to a global station monitoring service for real-time sea-level measuring stations that are part of IOC programs, i.e. (i) the Global Sea Level Observing System Core Network and (ii) the networks under the regional tsunami warning systems in the

Indian Ocean (IOTWMS), Northeast Atlantic & Mediterranean (NEAMTWS), Pacific (PTWS) and the Caribbean (CARIBE-EWS).

In the case of the IOC SLMF, the performance ratios of the desired stations for specific time periods are accessed. A manual check is done to verify operational status and check inconsistent data. For example, if there is no sea level data, a station might appear as Contributing RTX on IOC SLMF if data on battery voltage is available. ITIC-CAR and the managers of the IOC SLMF are regularly comparing data.

A document with figures highlighting the variability of data availability per station and sensor in SLMF can also be accessed through the ITIC-CAR website. Figure 2 shows a screenshot of the map of coastal sea level stations in the IOC SLMF database taken on January 8, 2024. As of February 2023, SLMF has been including DART stations' availability on their website. More information on DARTs will be discussed in another section of this report.

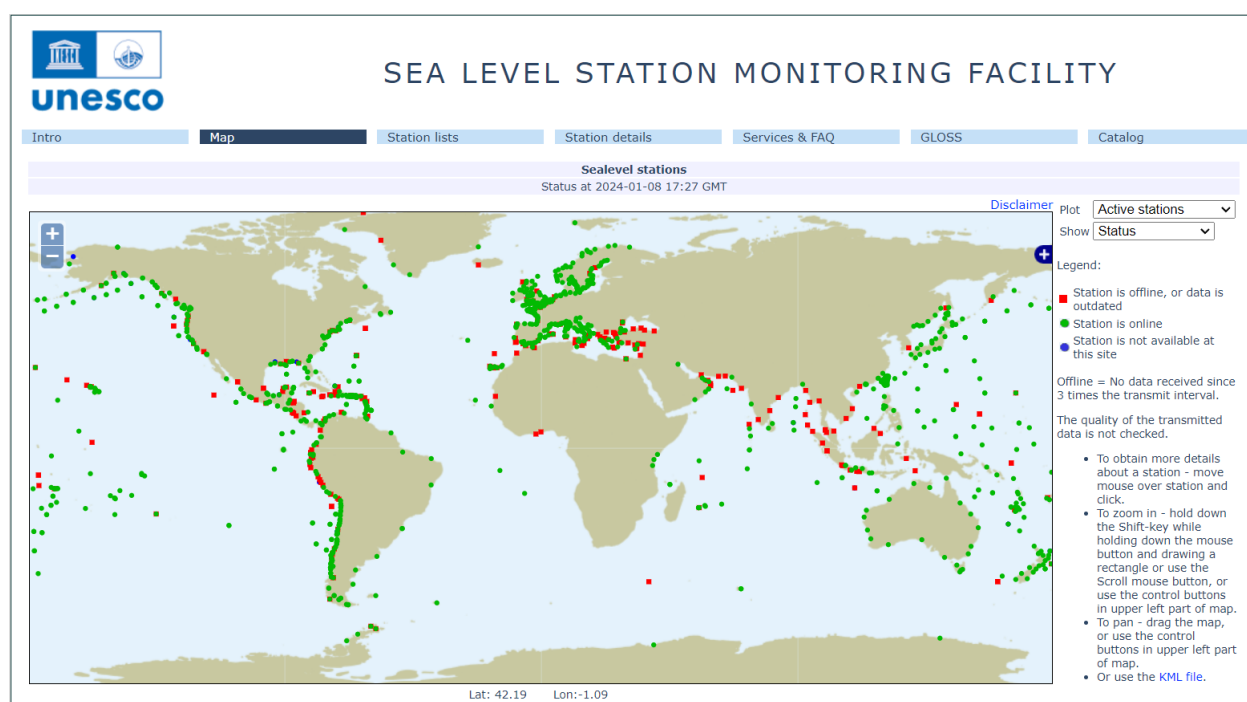


Figure 2. Screenshot of IOC Sea Level Monitoring Station Website on Map on January 8, 2024

Pacific Tsunami Warning Center (PTWC)

The Pacific Tsunami Warning Center (PTWC) operated by the United States National Weather Service of NOAA served from 2005-2015 as the interim Tsunami Warning Center. Since 2016 the PTWC has been designated as a Tsunami Service Provider (TSP) for the Tsunami and Other Hazards Warning and Mitigation System for the Caribbean and Adjacent Seas (CARIBE-EWS), a subsidiary body of UNESCO's Intergovernmental Oceanographic Commission (IOC).

Products issued by PTWC to countries around the Caribbean in support of this mission have evolved over time as supporting data, analysis methods, computational capabilities, and communications have all improved. The products developed by the PTWC are only advisory for the CARIBE EWS Member State. National authorities are responsible for determining the level of tsunami alert within each Member State.

On 1 March 2016, the US NOAA Pacific Tsunami Warning Center (PTWC) commenced issuance of new forecast-based Enhanced Tsunami Products for all Caribbean countries. The PTWC, PTWS, and CARIBE-EWS products use the same forecast methodologies and the same graphical formats to depict the tsunami threat for the basin and coastal polygons.

The PTWC depends on sea level data to confirm, forecast, and determine the end of the threat from tsunamis in the region. In the case of non-seismic generated tsunamis, sea level data is the main mechanism used to detect and inform on tsunami threat. Over the past years, the PTWC has been developing an alarm event detection system based on sea level data.

Since November 2019, the PTWC data have been incorporated into the ITIC-CAR Sea Level biannual reports to compare the data reported by the IOC SLMF with the data from PTWC. Stations reported in the PTWC are also included in the Tide Tool Sea Level Data Analysis Program. The PTWC-generated map for December 2023 is shown in Figure 3. The color legend is included in the map; sea level stations are represented as circles while the DART stations are represented by triangles. These maps show the ranges of percentage availability of the *Contributing RTX* stations. *Down* stations are reported in black. *Removed*, *Planned*, *Gap*, and *Unknown* stations are not included in the PTWC reports, nor do they appear on this map.

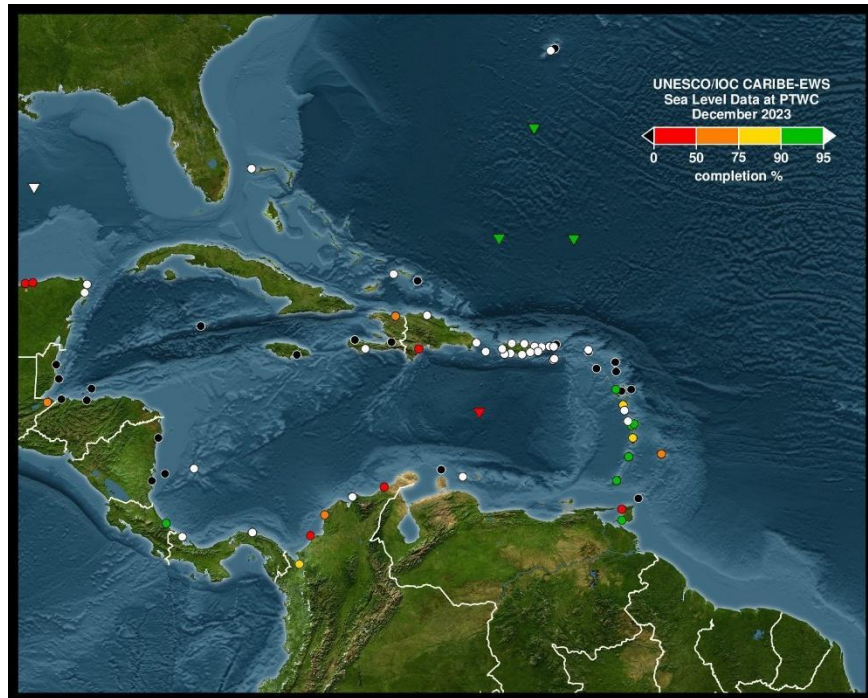
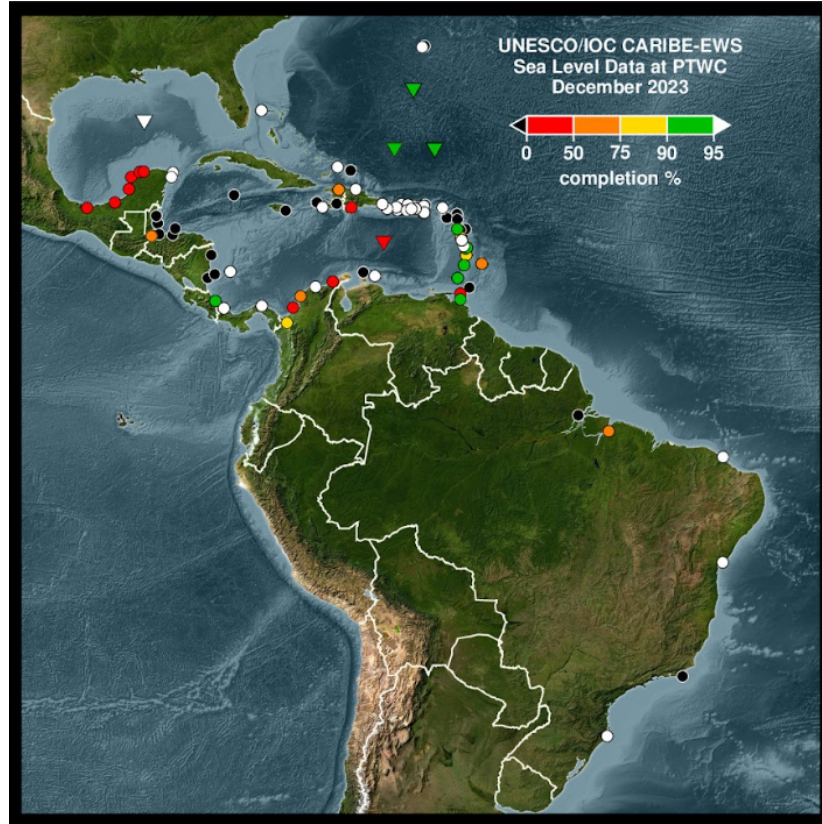


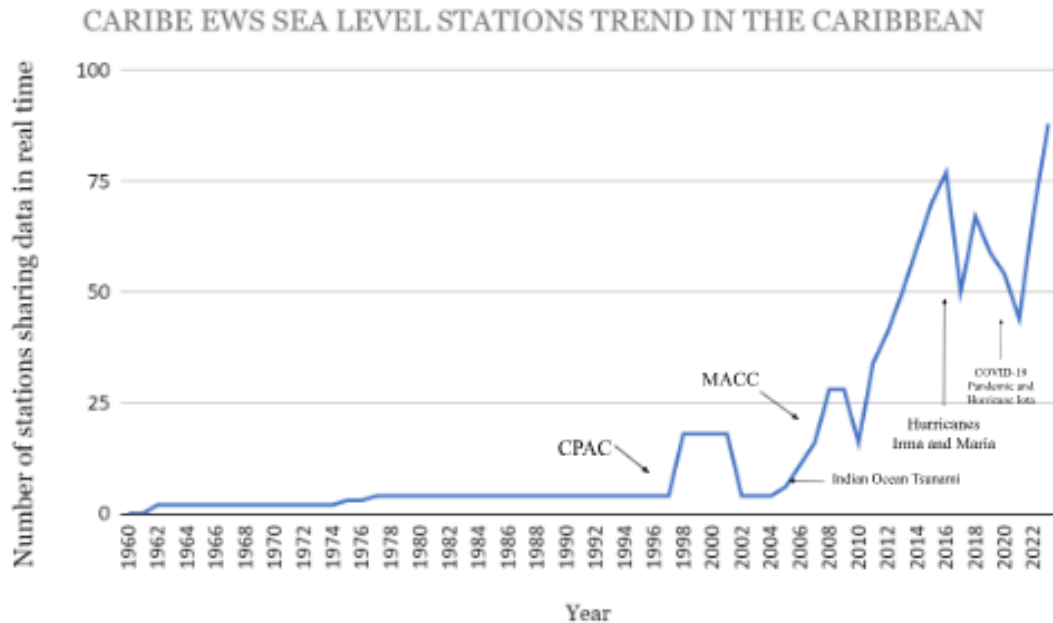
Figure 3. Regional and Expanded maps of status data from Sea Level and DART Station at PTWCs for December 2023. Circles represent coastal sea level stations and triangles, DARTs. The percentage refers to the percentage of data received at the PTWC within 15 minutes of recording.

Contributing RTX Sea Level Stations

The number of Contributing RTX stations increased during the 2022 to 2023 period from 68 stations in December 2022 to 70 stations in June 2023 and then 88 in December 2023 (Table 1). Note that the usual change goes from *Contributing RTX* to *Down* and vice versa. There were a few stations removed, and others reinstalled. Also, new stations were installed in Barbados, Anguilla, and Montserrat. Other stations like Cartagena from Colombia were repaired. Some stations in Brazil were also added to this report, and the Barbados Meteorological Services has also started sharing their station's information. Barometric Pressure information was added to the report as an additional column which tells if there is barometric pressure information available for that station. The evolution of sea level observations since 1960 is highlighted in Graph 3. In 2022, after several years of decreasing data availability due to the impacts of Hurricanes Irma, Maria, Eta, and Iota and COVID 19 the trend has reversed thanks to contributions of Member States and Donors.

Status by amount						
	Jun-21	Dec-21	Jun-22	Dec-22	Jun-23	Dec-23
Contributing RTX	46	44	59	68	70	88
Down	55	39	36	30	32	36
Existing	30	37	32	40	38	35
Gap	13	13	15	15	14	14
Planned	13	13	9	9	10	9
Removed	7	12	14	9	12	10
Unknown	1	19	16	13	10	4

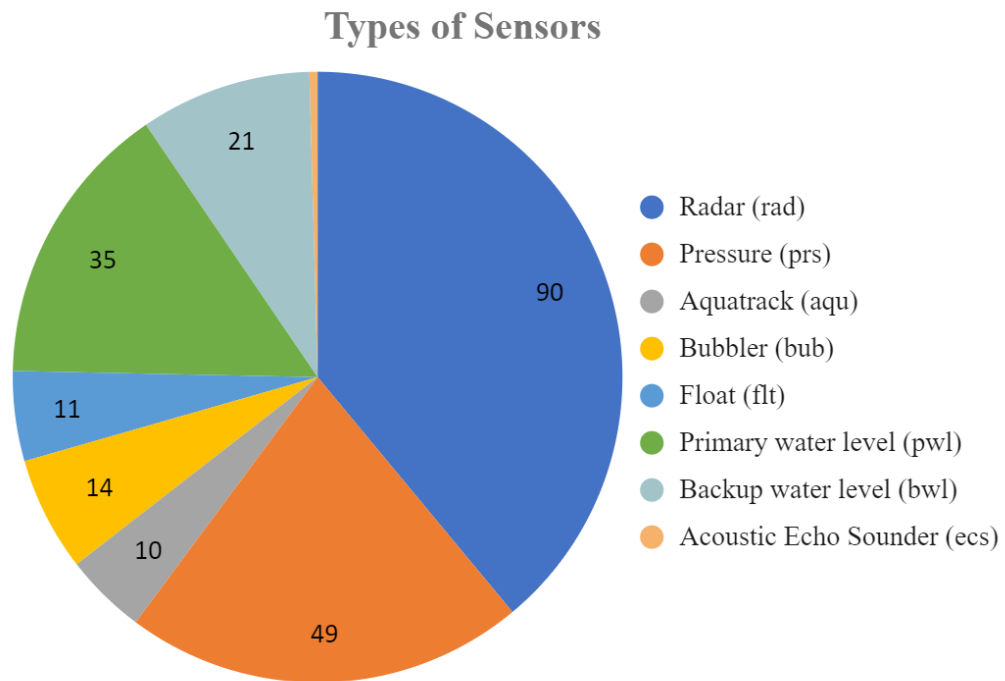
Table 1. Status of Sea Level Stations from June 2021 – December 2023.



Graph 3. Number of operational coastal sea level stations 1960 to 2023.)

Of the 198 stations being reported, 187 stations are coastal sea level stations and 11 are DARTs. The DARTs are going to be discussed in another section of this report. For the coastal Sea Level stations, each station has one or more sensors: radars (rad, ra1, ra2), pressure (prs, pr1, pr2), float (flt), or acoustic (Aquatrack, aqu). Graph 4 shows the distribution of types of sensors. For US stations, the nomenclature of the primary water level sensor (pwl) or backup water level sensor (bwl) is used depending on operational status, not on the type of sensor. In the past, the pwl were mostly Aquatrack sensors, but these have been replaced with radar sensors, while bwl sensors are bubblers or pressure sensors.

For December 2023, 88 stations were contributing RTX while 36 stations were down. The other 74 stations are existing (data not available), removed, planned, unknown, or represent gaps in monitoring.



Graph 4. Types of sensors for 2023.

DART

To facilitate early detection of tsunamis and to acquire data critical to real-time forecasts, NOAA operates Deep-ocean Assessment and Reporting of Tsunami (DART®) stations at sites in regions with a history of generating destructive tsunamis. NOAA completed the original 6-buoy operational array (map of original six stations) in 2001 and expanded to a full network of 39 stations in March 2008. See [DART® development](#) for more info. Since 2008 there have been changes in locations and upgraded technology.

The National Data Buoy Center (NDBC) currently is responsible for the operation of the DARTs. However, the Pacific Tsunami Warning Centre and the IOC Sea Level Monitoring Facility also report DART stations' availability using NOAA web services.

The DARTs in the Caribbean and Atlantic that are included in the report are Northeast Castle Rock Seamount ([DART 44401](#)), Southeast Block Canyon ([DART 44402](#)), Sable Island Bank ([DART 44403](#)), Southwest Bermuda ([DART 41425](#)), East Charleston ([DART 41424](#)), South of Puerto Rico ([DART 42407](#)), Gulf of Mexico ([DART 42409](#)), East Gulf of Mexico ([DART 42408](#)), Dart Wave Glider Station West Florida Area ([DART 42429](#)), North of St. Thomas ([DART 41421](#)) and North of Santo Domingo ([DART 41420](#)). At the end of 2023 the only stations reporting data online were the DARTs in the Southeast Block Canyon, Sable Island Bank, Southwest Bermuda, South of Puerto Rico, Gulf of Mexico, North of St. Thomas, and North of Santo Domingo (Figures 4 and 5). Graph 5 illustrates the variability of the availability of DART data between December 2020 and 2023.



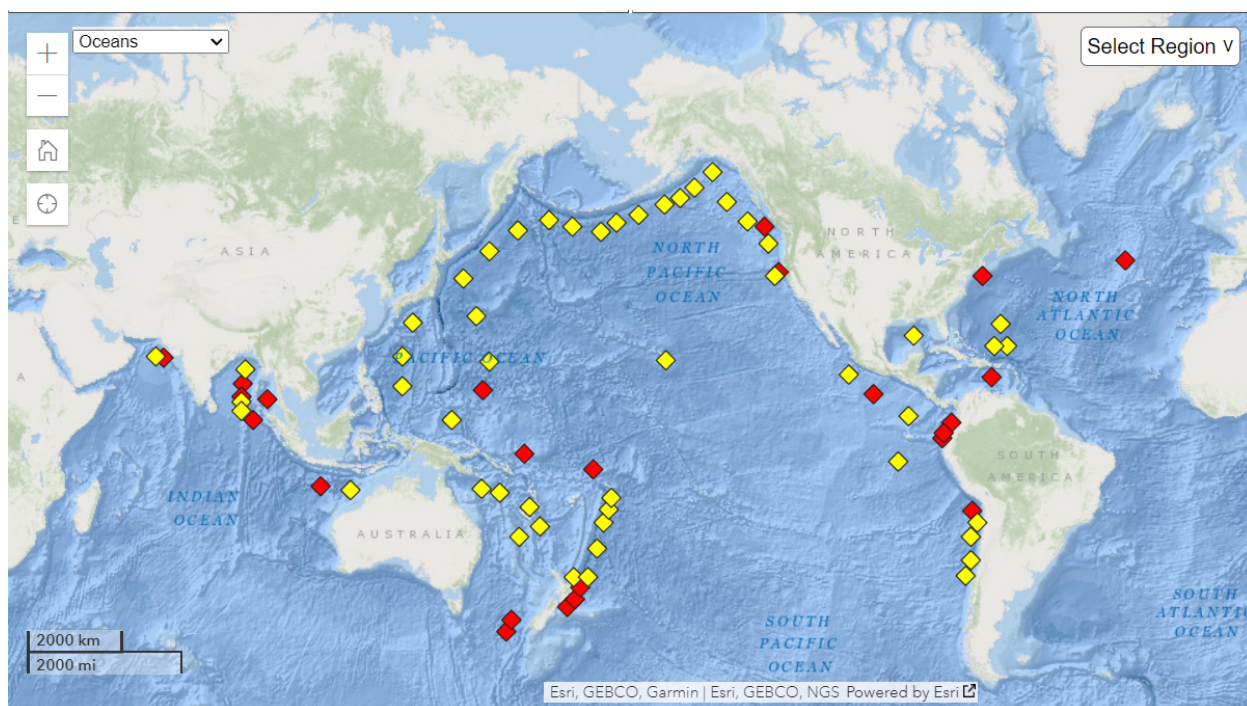
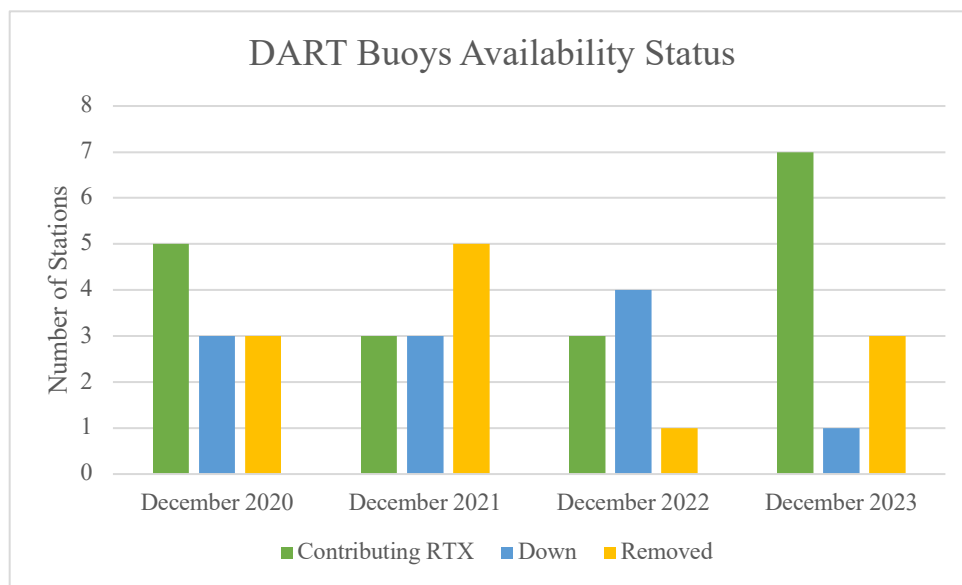


Figure 5. Originally developed by NOAA, as part of the U.S. National Tsunami Hazard Mitigation Program (NTHMP), the DART® Project was an effort to maintain and improve the capability for the early detection and real-time reporting of tsunamis in the open ocean.¹ December 15, 2023. Stations in yellow are operational and those in red non-operational.



Graph 5. DART Buoys availability status December 2020 – December 2023.

¹ <https://www.ndbc.noaa.gov/dart/dart.shtml>

Appendix List

- Appendix A: Sea Level Station List and Status 2022

Appendix A: Sea Level Stations December 2023

Station name	Barometric Pressure	Country	Status²
<i>Blowing Point</i>		Anguilla	Contributing RTX
<i>Road Bay</i>		Anguilla	Planned
<i>Barbuda</i>		Antigua and Barbuda	Down
<i>Parham (Camp Blizard), Antigua</i>		Antigua and Barbuda	Down
<i>Oranjestad</i>		Aruba	Down
<i>Settlement Point</i>		Bahamas	Contributing RTX
<i>Lee Stocking Island, Exuma</i>		Bahamas	Existing
<i>Matthew Town, Inagua</i>		Bahamas	Existing
<i>Nassau Harbour, New Providence</i>		Bahamas	Existing
<i>Treasure Cay, Abaco</i>		Bahamas	Existing
<i>Bridgetown Port</i>		Barbados	Down
<i>Port St. Charles</i>		Barbados	Down
<i>Pelican Fort</i>		Barbados	Removed
<i>Conset Bay</i>		Barbados	Contributing RTX
<i>Speightstown</i>		Barbados	Contributing RTX
<i>Carrie Bow Cay</i>		Belize	Contributing RTX
<i>Belize City</i>		Belize	Planned
<i>Belize</i>		Belize	Removed
<i>Port of Belize</i>		Belize	Down
<i>St. Georges Cruise Pier</i>		Bermuda	Down
<i>St. Georges Island / Esso Pier</i>		Bermuda	Contributing RTX

² Contributing Stations are being received at PTWC, integrated into Tide Tool and are available on the IOC Sea Level Monitoring Facility. DART stations are also available through the NOAA National Data Buoy Center.

<i>Bermuda Biological Station</i>		Bermuda	Down
<i>Bermuda Somerset</i>		Bermuda	Contributing RTX
<i>Porto do Forno</i>	Yes	Brazil	Contributing RTX
<i>Arraial do Cabo</i>	Yes	Brazil	Down
<i>Belém</i>	Yes	Brazil	Contributing RTX
<i>Porto de Belém</i>	Yes	Brazil	Contributing RTX
<i>Fortaleza</i>	Yes	Brazil	Contributing RTX
<i>Porto de Mucuripe</i>	Yes	Brazil	Contributing RTX
<i>Imbituba</i>	Yes	Brazil	Contributing RTX
<i>Imbituba 2</i>	Yes	Brazil	Contributing RTX
<i>Porto de Imbituba</i>	Yes	Brazil	Down
<i>Porto de Santana</i>	Yes	Brazil	Down
<i>Salvador</i>	Yes	Brazil	Contributing RTX
<i>Capitania dos Portos</i>	Yes	Brazil	Down
<i>Road Town Harbor, Tortola</i>		British Virgin Islands	Down
<i>Cayman Brac</i>		Cayman Islands	Existing
<i>George Town</i>		Cayman Islands	Down
<i>Gun Bay</i>		Cayman Islands	Contributing RTX
<i>Little Cayman</i>		Cayman Islands	Down
<i>Ballenas</i>		Colombia	Contributing RTX
<i>Cartagena</i>		Colombia	Contributing RTX
<i>San Andres</i>		Colombia	Contributing RTX
<i>Santa Marta</i>		Colombia	Contributing RTX
<i>Capurganá</i>		Colombia	Removed

<i>Sapzurro</i>		Colombia	Contributing RTX
<i>Turbo</i>		Colombia	Contributing RTX
<i>Islas del Rosario</i>		Colombia	Removed
<i>Isla Naval</i>		Colombia	Contributing RTX
<i>Isla Fuerte</i>		Colombia	Contributing RTX
<i>Coveñas</i>		Colombia	Contributing RTX
<i>Puerto Estrella</i>		Colombia	Down
<i>Limón</i>		Costa Rica	Contributing RTX
<i>Cabo Cruz</i>		Cuba	Existing
<i>Cabo San Antonio - Morros de Piedra</i>		Cuba	Existing
<i>Gibara</i>		Cuba	Existing
<i>Isabela de Sagua</i>		Cuba	Existing
<i>Manzanillo</i>		Cuba	Existing
<i>Guantanamo</i>		Cuba	Gap
<i>Casilda</i>		Cuba	Existing
<i>Maisí</i>		Cuba	Existing
<i>Mariel Boca</i>		Cuba	Existing
<i>Bahia de la Habana</i>		Cuba	Existing
<i>Nuevitas Punta de Practicos</i>		Cuba	Existing
<i>Puerto Padre</i>		Cuba	Existing
<i>Nuevitas Bufaderos</i>		Cuba	Existing
<i>Siboney</i>		Cuba	Existing
<i>Santiago de Cuba</i>		Cuba	Existing
<i>Santa Cruz del Sur</i>		Cuba	Existing

<i>Carapachibey</i>		Cuba	Existing
<i>Cayo Loco</i>		Cuba	Existing
<i>Cayo Largo</i>		Cuba	Existing
<i>La Coloma</i>		Cuba	Existing
<i>Bullen Bay</i>		Curacao	Contributing RTX
<i>Marigot</i>		Dominica	Down
<i>Roseau</i>		Dominica	Contributing RTX
<i>Portsmouth</i>		Dominica	Contributing RTX
<i>Barahona</i>		Dominican Republic	Contributing RTX
<i>Puerto Caucedo/San Andres/Santo Domingo</i>		Dominican Republic	Contributing RTX
<i>Puerto Plata</i>		Dominican Republic	Contributing RTX
<i>Punta Cana</i>		Dominican Republic	Contributing RTX
<i>Bahía de Luperón</i>		Dominican Republic	Gap
<i>Bahía de Samaná</i>		Dominican Republic	Gap
<i>Bayahibe</i>		Dominican Republic	Gap
<i>Pedernales</i>		Dominican Republic	Gap
<i>Puerto de Santo Domingo</i>		Dominican Republic	Removed
<i>Ile Royale</i>		French Guiana	Contributing RTX
<i>Prickly Bay</i>		Grenada	Contributing RTX
<i>Sauteurs</i>		Grenada	Planned
<i>The Sisters Island</i>		Grenada	Planned
<i>Pointe à Pitre</i>		Guadeloupe	Contributing RTX
<i>Deshaies Harbour</i>		Guadeloupe	Contributing RTX

<i>La Désirade Island, Grande Anse Marina Harbour</i>		Guadeloupe	Down
<i>Puerto Barrios</i>		Guatemala	Contributing RTX
<i>Harbour Master Boathouse</i>		Guyana	Existing
<i>Market Place Georgetown</i>		Guyana	Existing
<i>Rosignol</i>		Guyana	Existing
<i>Parika</i>		Guyana	Existing
<i>Cap Haitien</i>		Haiti	Contributing RTX
<i>Jacmel</i>		Haiti	Down
<i>Port au Prince</i>		Haiti	Down
<i>Gonaives</i>		Haiti	Planned
<i>Port de Paix</i>		Haiti	Planned
<i>Jeremie</i>		Haiti	Down
<i>St. Louis du Sud</i>		Haiti	Contributing RTX
<i>Guanaja Island</i>		Honduras	Existing
<i>Omoa</i>		Honduras	Existing
<i>Puerto Cortes</i>		Honduras	Down
<i>Puerto De Castilla, Trujillo</i>		Honduras	Down
<i>Roatan N</i>		Honduras	Existing
<i>Punta Gorda Harbor, Roatan S</i>		Honduras	Down
<i>Tela Harbor</i>		Honduras	Unknown
<i>Utila Island</i>		Honduras	Unknown
<i>Cabotaje Harbor, La Ceiba</i>		Honduras	Down

<i>Cochino Pequeño</i>		Honduras	Gap
<i>Swan Island</i>		Honduras	Gap
<i>Port Royal</i>		Jamaica	Down
<i>Montego Bay</i>		Jamaica	Existing
<i>Port Antonio</i>		Jamaica	Existing
<i>Discovery Bay, Jamaica</i>		Jamaica	Gap
<i>Alligator Pond</i>		Jamaica	Gap
<i>Fort de France Harbour</i>		Martinique	Contributing RTX
<i>Le Precheur Harbour</i>		Martinique	Contributing RTX
<i>Le Robert</i>		Martinique	Contributing RTX
<i>Alvarado</i>	Yes	Mexico	Contributing RTX
<i>Celestun</i>		Mexico	Contributing RTX
<i>Ciudad del Carmen</i>	Yes	Mexico	Contributing RTX
<i>Lerma Campeche</i>		Mexico	Contributing RTX
<i>Frontera</i>		Mexico	Contributing RTX
<i>Isla Mujeres</i>	Yes	Mexico	Contributing RTX
<i>Progreso</i>	Yes	Mexico	Contributing RTX
<i>Puerto Morelos, Q. R.</i>	Yes	Mexico	Contributing RTX
<i>Sanchez Magallanes</i>	Yes	Mexico	Contributing RTX
<i>Sisal</i>		Mexico	Contributing RTX
<i>Tuxpan</i>	Yes	Mexico	Contributing RTX
<i>Telchac</i>		Mexico	Contributing RTX
<i>Veracruz</i>	Yes	Mexico	Contributing RTX
<i>Little Bay</i>		Montserrat	Planned
<i>Corn Island</i>		Nicaragua	Down

<i>Blue Fields</i>		Nicaragua	Gap
<i>Puerto Bilwi</i>		Nicaragua	Down
<i>Puerto Cabezas</i>		Nicaragua	Gap
<i>Puerto El Bluff</i>		Nicaragua	Down
<i>El Porvenir</i>		Panama	Contributing RTX
<i>Bocas del Toro</i>		Panama	Contributing RTX
<i>Galeta Point</i>		Panama	Existing
<i>Limon Bay (replaced Coco Solo)</i>		Panama	Existing
<i>Aguadilla</i>		Puerto Rico	Unknown
<i>Arecibo</i>		Puerto Rico	Contributing RTX
<i>Culebra Island</i>	Yes	Puerto Rico	Contributing RTX
<i>Fajardo</i>		Puerto Rico	Contributing RTX
<i>Guayanilla</i>		Puerto Rico	Contributing RTX
<i>Isabel II, Vieques</i>		Puerto Rico	Contributing RTX
<i>La Esperanza, Vieques</i>	Yes	Puerto Rico	Contributing RTX
<i>Magueyes Island</i>	Yes	Puerto Rico	Contributing RTX
<i>Mayagüez</i>	Yes	Puerto Rico	Contributing RTX
<i>Mona Island</i>	Yes	Puerto Rico	Contributing RTX
<i>Salinas</i>		Puerto Rico	Contributing RTX
<i>San Juan</i>	Yes	Puerto Rico	Contributing RTX
<i>Yabucoa</i>		Puerto Rico	Contributing RTX
<i>Peñuelas</i>		Puerto Rico	Removed
<i>Caja de Muertos</i>		Puerto Rico	Removed
<i>Baseterre (Coast Guard Base)</i>		St. Kitts & Nevis	Down
<i>Dennery Harbour</i>		St. Lucia	Contributing RTX

<i>Soufriere</i>		St. Lucia	Contributing RTX
<i>Vieux Fort Bay</i>		St. Lucia	Contributing RTX
<i>Ganter's Bay</i>		St. Lucia	Contributing RTX
<i>Calliaqua (Coast Guard Base)</i>		St. Vincent & the Grenadines	Contributing RTX
<i>Chateau Bel-Air</i>		St. Vincent & the Grenadines	Contributing RTX
<i>Gustavia</i>		St. Barthelemy	Planned
<i>Saint Martin Island</i>		St. Martin	Down
<i>Cedros Bay</i>		Trinidad and Tobago	Unknown
<i>Charlotteville</i>		Trinidad and Tobago	Unknown
<i>Point Fortin</i>		Trinidad and Tobago	Unknown
<i>Port Of Spain</i>		Trinidad and Tobago	Contributing RTX
<i>Scarborough</i>		Trinidad and Tobago	Down
<i>Toco Trinidad</i>		Trinidad and Tobago	Planned
<i>Point Galeota</i>		Trinidad and Tobago	Contributing RTX
<i>Point a Pierre</i>		Trinidad and Tobago	Planned
<i>Grand Turk</i>		Turks and Caicos	Down
<i>Sapodilla Bay, Providenciales</i>		Turks and Caicos	Contributing RTX
<i>Charlotte Amalie, St. Thomas</i>	Yes	USVI	Contributing RTX
<i>Christiansted Harbor, St. Croix</i>	Yes	USVI	Contributing RTX
<i>Lameshur Bay, St. John</i>	Yes	USVI	Contributing RTX
<i>Lime Tree Bay, St. Croix</i>	Yes	USVI	Contributing RTX
<i>Aves Island</i>		Venezuela	Gap

*Punta Arenas,
Margarita Island*

La Guaira

	Venezuela	Gap
	Venezuela	Gap