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Intergovernmental
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Commission

Working Group 1 Monitoring and Detection Systems
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

2021 Report

[Abstract](#)

Report of coastal sea level stations and DARTs contributing to the CARIBE EWS in 2021. In December 2021, of the 177 stations in the CARIBE EWS sea level inventory, data from 44 were available in support of tsunami warning.

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Acknowledgments

First and foremost, a special recognition to the sea level station operators and data analysts in the Caribbean and adjacent regions; they keep the stations running and create awareness on data issues. Our appreciation also goes out to Stuart Weinstein from the Pacific Tsunami Warning Center for generating the monthly reports and maps on sea level status and for his support and updates to Tide Tool sea level data analysis program. We also acknowledge Tjess Hernandez and Bart Vanhoorne from the IOC Sea Level Monitoring facility for maintaining this vital tool and clarification on station status and data formats. An acknowledgement also to the International Tsunami Information Center Caribbean Office (previously known as the Caribbean Tsunami Warning Program), especially Stephanie Soto, Dariel Carrion, Desiree Bayouth, and Christa von Hillebrandt-Andrade for tracking station status and preparing this report.

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 also used to confirm the tsunami generation, forecast its severity or to 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 type 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 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, the NOAA National Data Buoy Center in the case of the DARTs and the Pacific Tsunami Warning Center as the designated Tsunami Service Provider for the CARIBE EWS, DART and coastal sea level stations.

In December 2021, of the 177 stations in the CARIBE EWS sea level inventory, 44 were contributing data in real time for tsunami warning. This includes 3 of 6 DART stations. In contrast, in December 2020 there were a total of 176 stations and 59 contributing, which was very similar to December 2019.

Introduction

Since 2010, the International Tsunami Information Center Caribbean Office (ITIC-CAR) 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 report on the status of coastal sea level stations and DARTs. The PTWC also prepared monthly maps on sea level data availability at their center and ITIC-CAR has posted these on caribewave.info as well as shared with CARIBE EWS WG1 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-XV) in its Recommendation ICG/CARIBE-EWS-XIV.2 on Tsunami Monitoring and Detection Systems:

- Requested ITIC-CAR 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 27–29 April 2021, the ICG/CARIBE EWS-XV) in its Recommendation ICG/CARIBE-EWS-XV.1 on Tsunami Monitoring and the Systems:

- 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,

This report covers the sea level component of the recommendations.

Sea Level Stations Status Categories for 2021

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:

<i>Contributing Real Time (Contributing RTX)</i>	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 thru FTP or GTS (GOES), are accessible to tsunami service providers and tsunami warning centers and can be accessed thru Tide Tool, IOC SLMF and other sites. For reports prepared thru 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 which have been removed or relocated.
<i>Unknown</i>	Stations for which there is no data on its current operational status.

This classification was used for the 2021 biannual sea level reports as well as this report. Figure 1 shows the status of the 171 coastal stations in the inventory at the end of 2021. Graph 1 shows the biannual number of sea level stations from December 2020, June 2021, and December 2021 for which data was contributing close to real time (Contributing RTX). According to the statistics, there has been a decline in the total number of Contributing RTX stations, from 59 stations contributing by the end of 2020 to 44 in December 2021. 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 (caribewave.org). Appendix 1 has a table with the status of all the stations as of December 2021.

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

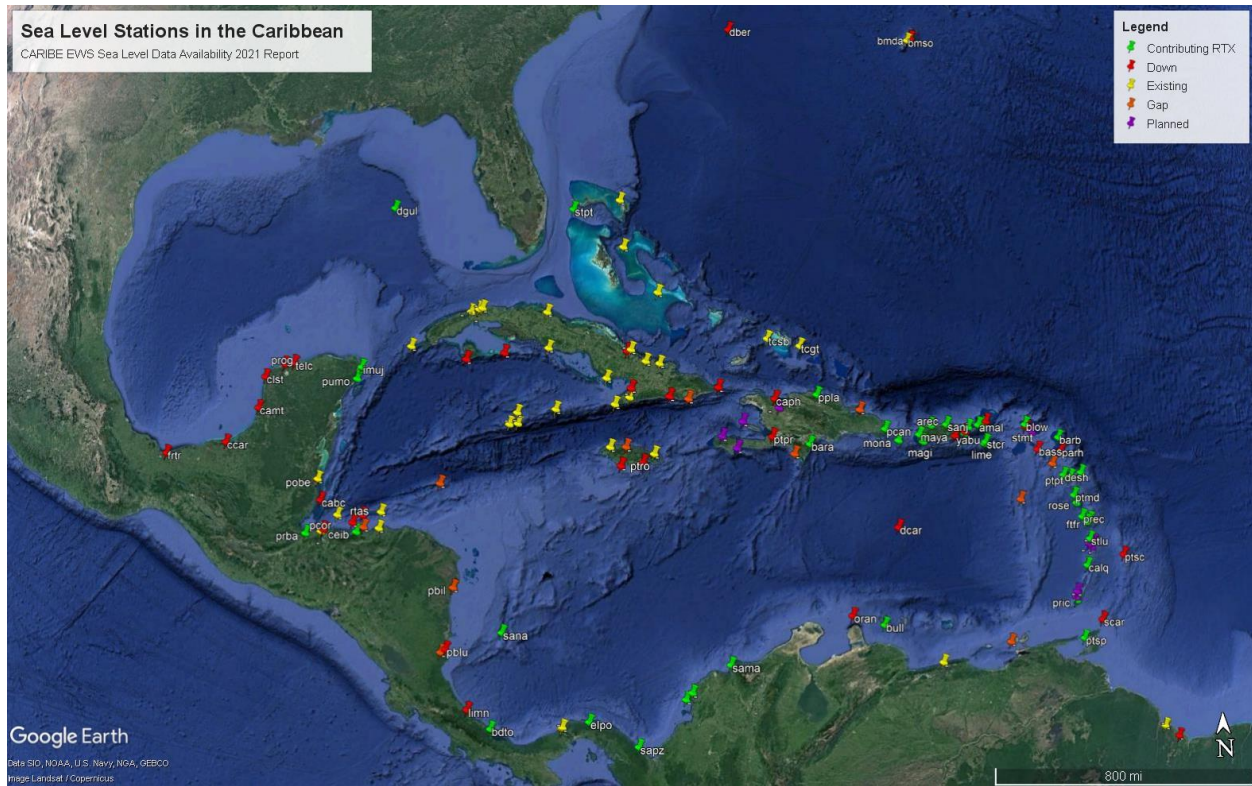
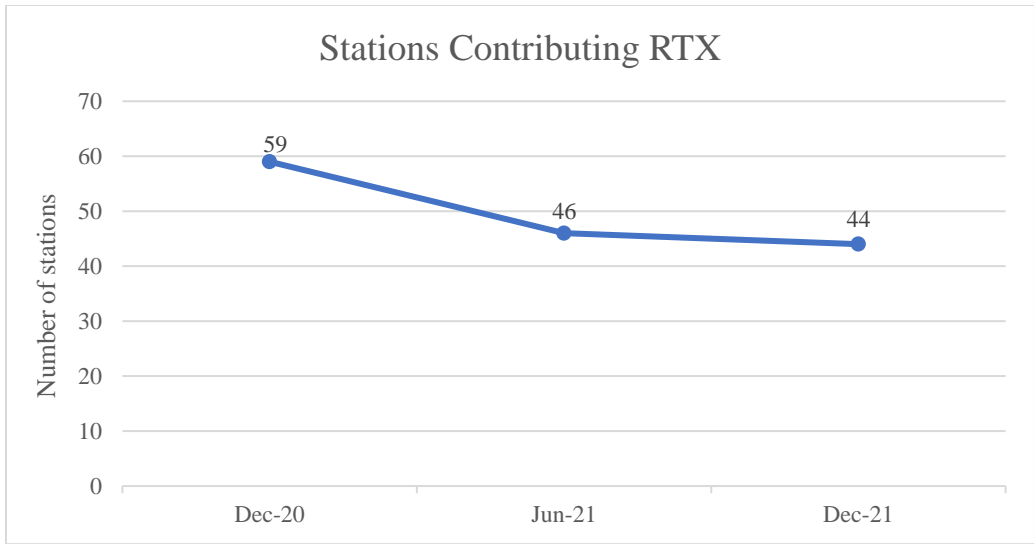
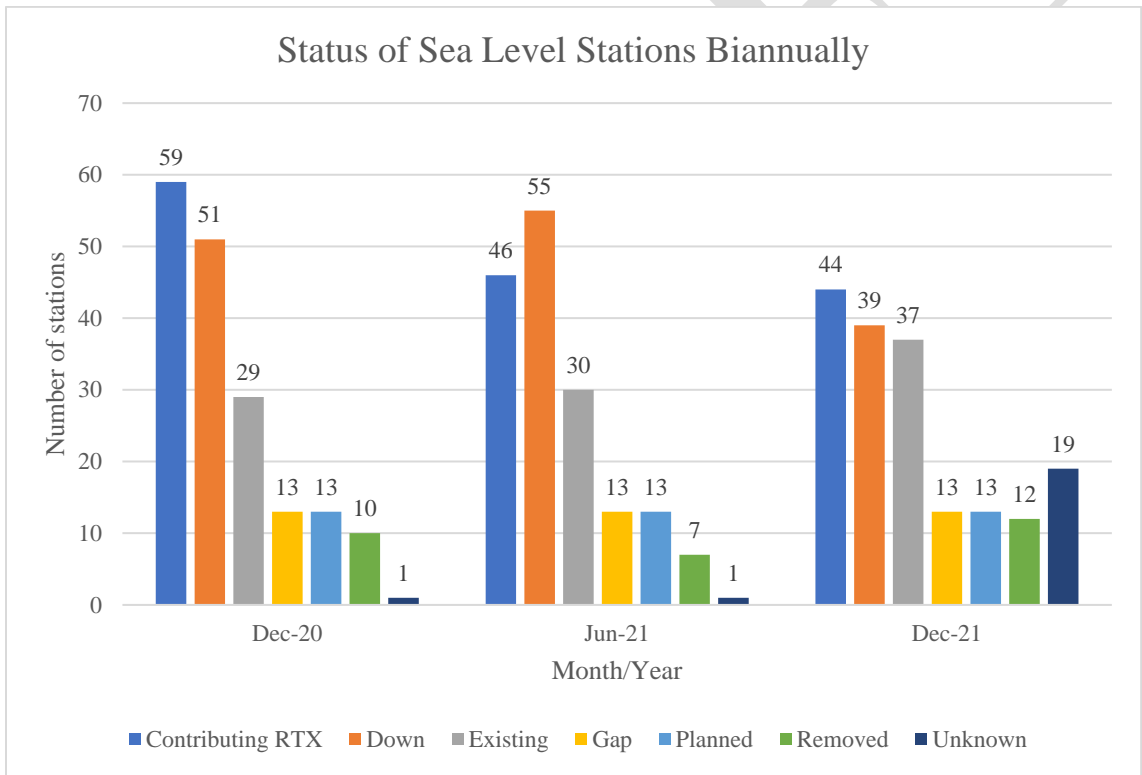


Figure 1. December 2021 Sea Level Stations Status.



Graph 1. Biannual variability of number of Contributing RTX coastal sea level stations and DARTs from December 2020, June 2021, and December 2021.



Graph 2. Station Status Biannually.

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 operational monitoring of sea level measuring stations in Africa and was developed from 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 constantly 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 data base taken on February 18, 2022. The SLMF does not include DARTs, these will be discussed in another section of this report.

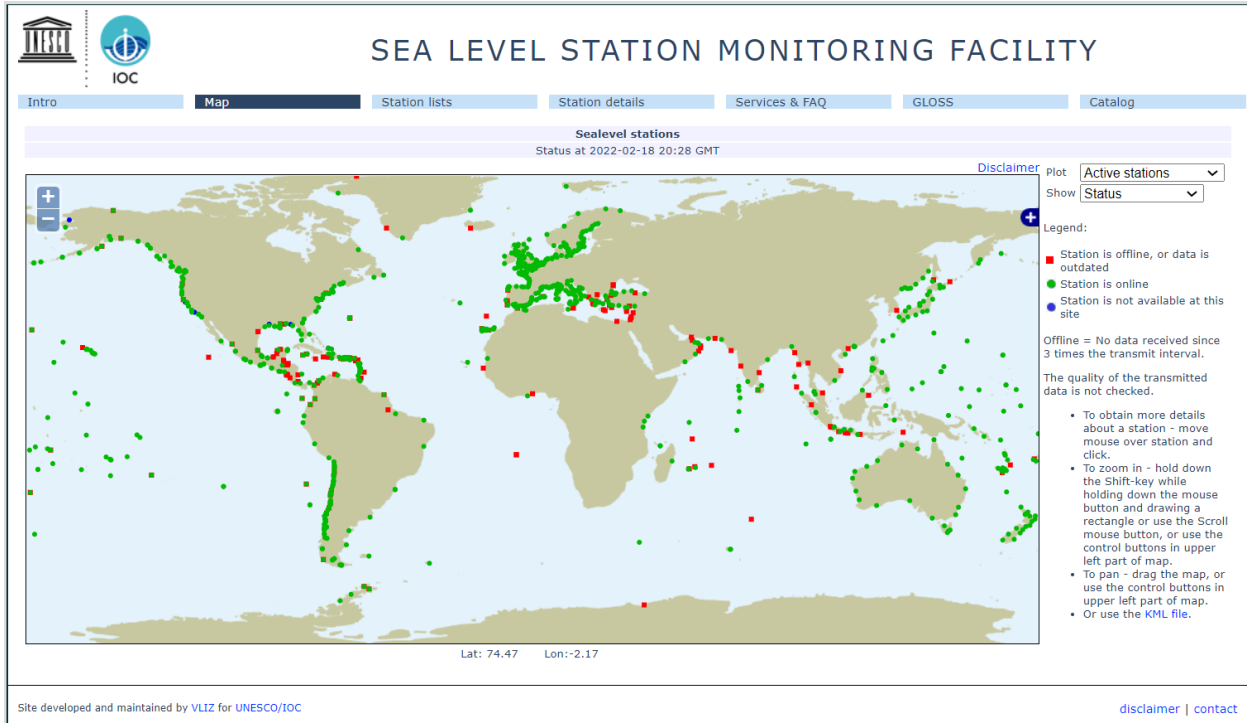


Figure 2. Screenshot of IOC Sea Level Monitoring Station Website on Map on February 18, 2022

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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 is 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 for 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 end of threat from tsunamis in the region. In the case of non-seismic generated tsunamis, sea level data are 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. The PTWC generated map for December 2021 is shown on Figure 3. The color legend is attached to 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.

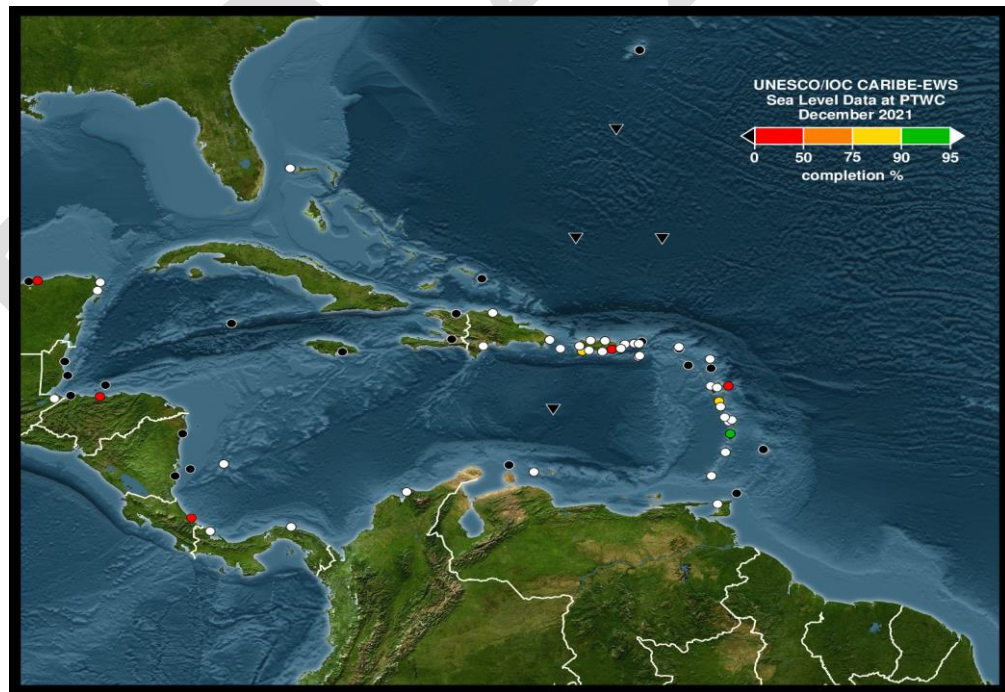
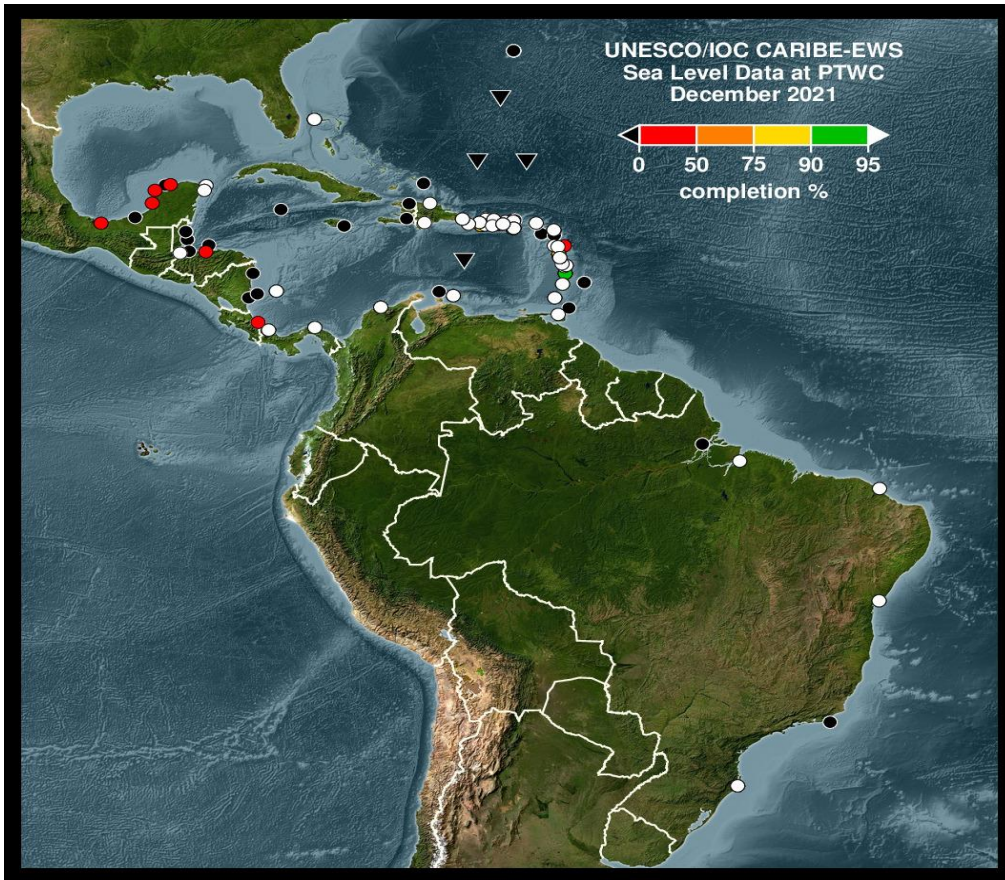


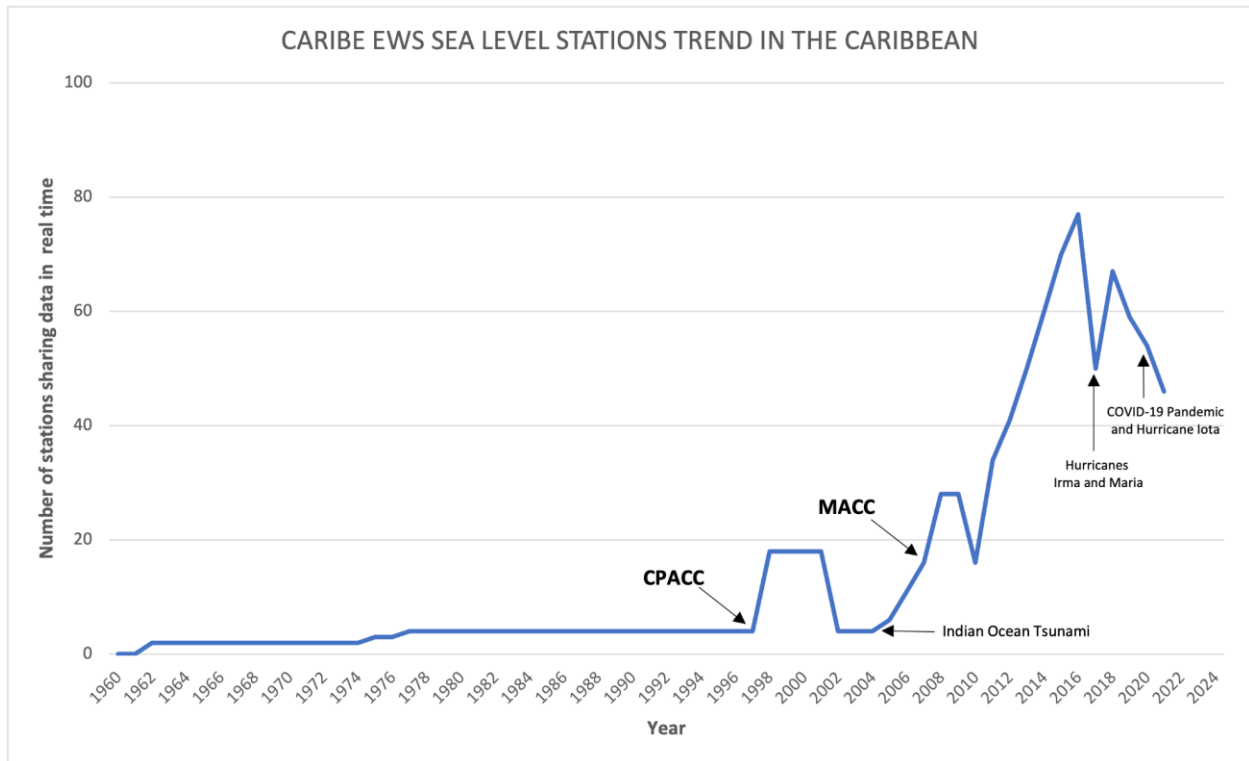
Figure 3. Regional and Expanded maps of status data from Sea Level and DART Station at PTWCs for December 2021. The percentage refers to the percentage of data received at the PTWC within 15 minutes of recording.

Contributing RTX Sea Level Stations

The number of Contributing RTX stations declined during the 2020 to 2021 period from 59 stations in December 2020 to 46 stations in June 2021 and the 44 in December 2021 (Table 1). Note that the usual change goes from *Contributing RTX* to *Down* and vice versa. There were a few stations that were removed, and others reinstalled. Four stations from the Cayman Islands as other stations were installed in and should be reflected as contributing data as of 2022. The evolution of sea level observations since 1960 is highlighted in Graph 3. After steady gains since 2010, the impacts of Hurricanes Irma, Maria, Eta and Iota and compounded by COVID 19 which limited technician travel is significant. In June 2021 several stations were taken out due to the impact of the hurricanes ETA and IOTA in the western Caribbean. Some other stations were recovered and new stations were installed in other parts of the region, if not the net decrease in data availability would have been greater.

Status by amount			
	Dec-20	Jun-21	Dec-21
Contributing RTX	59	46	44
Down	51	55	39
Existing	29	30	37
Gap	13	13	13
Planned	13	13	13
Removed	10	7	12
Unknown	1	1	19

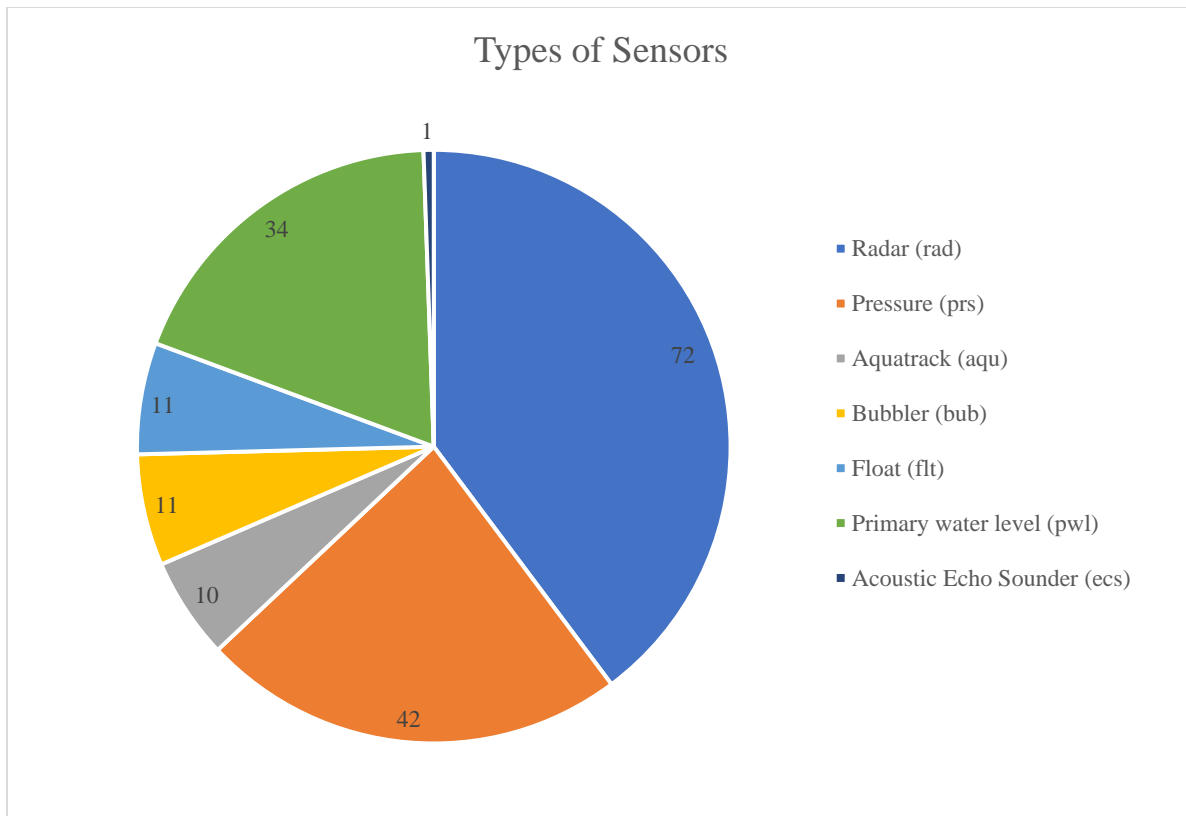
Table 1. Status of Sea Level Stations through 2021.



Graph 3. Historical projection of coastal sea level stations 1960 to present (2021).

Of the 177 stations being reported, 171 stations are coastal sea level stations and 6 of them are DART. 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 primary water level sensor (pwl) or backup water level sensor (bwl) is used, depending on operational status, not on the type of sensors. 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 2021, 44 stations were contributing RTX while 39 stations were down. The other 94 stations are existing (data not available), down, planned, unknown or represent gaps in monitoring.



Graph 4. Types of sensors

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 of locations and upgraded technology.

The National Data Buoy Center (NDBC) currently is responsible for the operation of the DARTs.

The DARTs in the Caribbean and Atlantic and included in the report are: Southeast Block Canyon ([DART 44402](#)), Sable Island Bank ([DART 44403](#)), Southwest Bermuda ([DART 41425](#)), South of Puerto Rico ([DART 42407](#)), Gulf of Mexico ([DART 42409](#)), 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 2021 the only stations reporting data online were the DARTs in the Gulf of Mexico and two off north eastern US (Figures 4 and 50. Graph 5 illustrates the variability of availability of DART data between December 2020 and 2021.

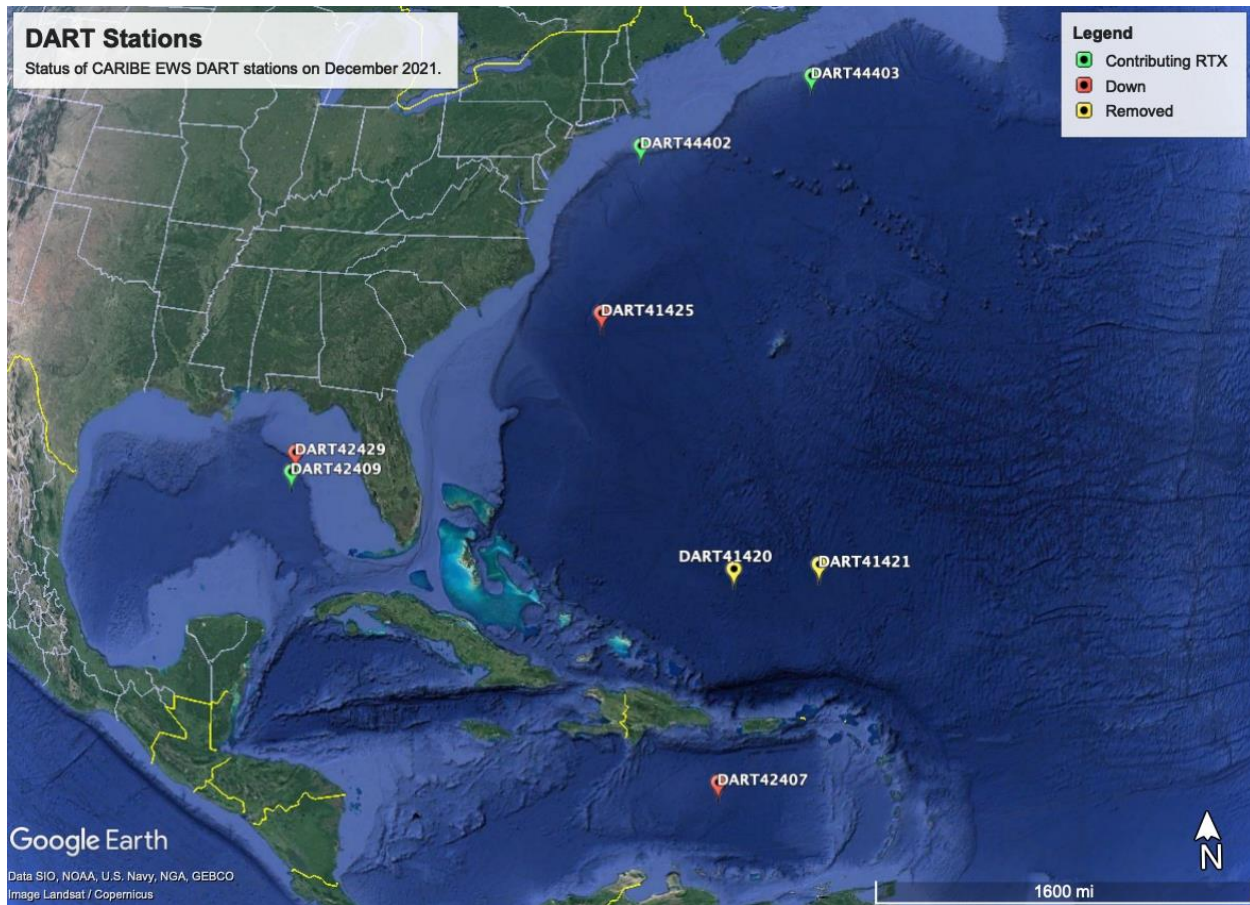


Figure 4. Map of DART stations for December 2021.

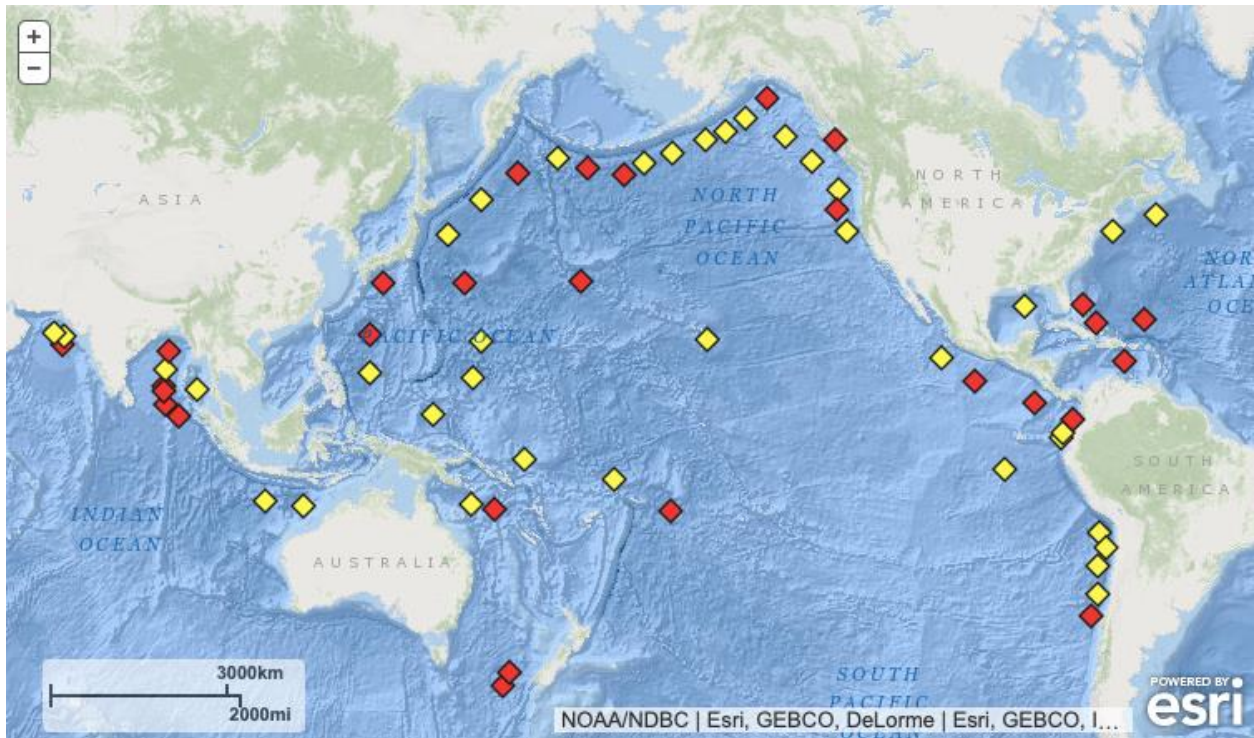
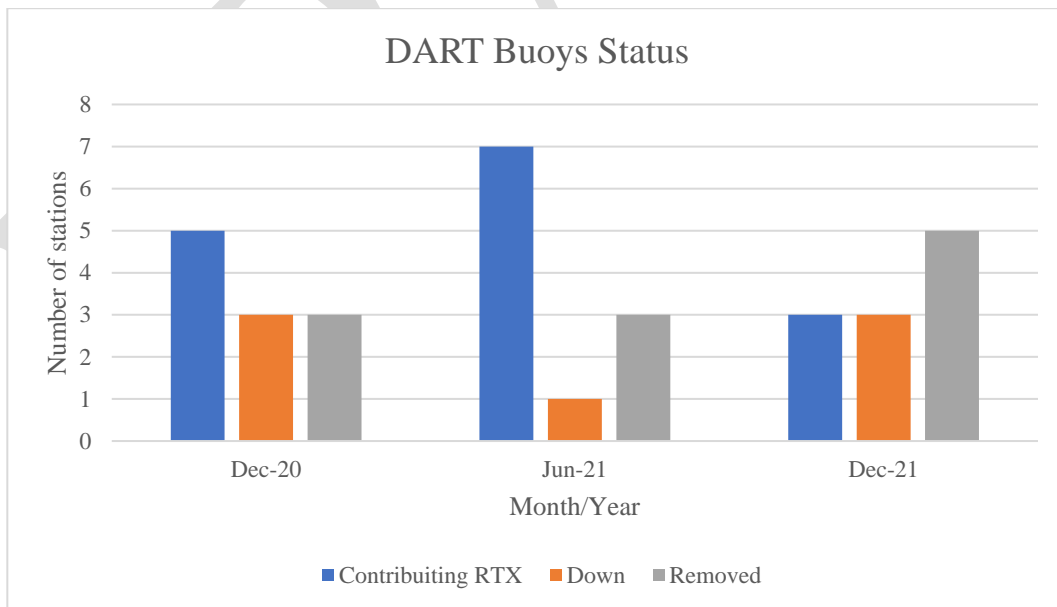


Figure 5. Originally developed by NOAA, as part of the U.S. National Tsunami Hazard Mitigation Program (NTHMP), the DART® Project was an effort to maintain and improve the capability for the early detection and real-time reporting of tsunamis in the open ocean.¹



Graph 5. DART Buoys status December 2020 – December 2021

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

Appendix List

- [Appendix A: Sea Level Station List and Status 2021](#)

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Appendix A: Sea Level Stations 2021

Station name	Country	Status
<i>Blowing Point</i>	Anguilla	Contributing RTX
<i>Barbuda</i>	Antigua and Barbuda	Contributing RTX
<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	Unknown
<i>Port St. Charles</i>	Barbados	Down
<i>Pelican Fort</i>	Barbados	Removed
<i>Conset Bay</i>	Barbados	Removed
<i>Speightstown</i>	Barbados	Removed
<i>Carrie Bow Cay</i>	Belize	Down
<i>Belize City</i>	Belize	Planned
<i>Belize</i>	Belize	Existing
<i>Port of Belize</i>	Belize	Down
<i>St. Georges Cruice Pier</i>	Bermuda	Existing
<i>St. Georges Island / Esso Pier</i>	Bermuda	Existing
<i>Bermuda Biological Station</i>	Bermuda	Down
<i>Bermuda Somerset</i>	Bermuda	Existing
<i>Road Town Harbor, Tortola</i>	British Virgin Islands	Down
<i>Cayman Brac</i>	Cayman Islands	Existing
<i>George Town</i>	Cayman Islands	Existing
<i>Gun Bay</i>	Cayman Islands	Existing
<i>Little Cayman</i>	Cayman Islands	Existing
<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>Islas del Rosario</i>	Colombia	Removed
<i>Isla Naval</i>	Colombia	Contributing RTX
<i>Coveñas</i>	Colombia	Unknown
<i>Puerto Estrella</i>	Colombia	Unknown
<i>Limón</i>	Costa Rica	Down
<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	Down
<i>Guantanamo</i>	Cuba	Gap
<i>Casilda</i>	Cuba	Existing
<i>Maisí</i>	Cuba	Down
<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	Down
<i>Siboney</i>	Cuba	Existing
<i>Santiago de Cuba</i>	Cuba	Down
<i>Santa Cruz del Sur</i>	Cuba	Existing
<i>Carapachibey</i>	Cuba	Down
<i>Cayo Loco</i>	Cuba	Existing
<i>Cayo Largo</i>	Cuba	Down
<i>La Coloma</i>	Cuba	Existing
<i>Willemstad</i>	Curacao	Removed
<i>Bullen Bay (Replaces Willemstad)</i>	Curacao	Contributing RTX
<i>Portsmouth</i>	Dominica	Planned
<i>Marigot</i>	Dominica	Unknown
<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	Unknown
<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	Unknown
<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	Contributing RTX
<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	Down
<i>Parika</i>	Guyana	Unknown
<i>Cap Haitien</i>	Haiti	Down
<i>Jacmel</i>	Haiti	Unknown
<i>Port au Prince</i>	Haiti	Down
<i>Gonaives</i>	Haiti	Planned
<i>Port de Paix</i>	Haiti	Planned
<i>Jeremie</i>	Haiti	Planned
<i>St. Louis du Sud</i>	Haiti	Planned
<i>Guanaja Island</i>	Honduras	Existing
<i>Omoa</i>	Honduras	Existing
<i>Puerto Cortes</i>	Honduras	Down
<i>Puerto De Castilla, Trujillo</i>	Honduras	Existing
<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	Down
<i>Cabotaje Harbor, La Ceiba</i>	Honduras	Contributing RTX
<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	Down
<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>	Mexico	Unknown
<i>Celestun</i>	Mexico	Down
<i>Ciudad del Carmen</i>	Mexico	Down
<i>Lerma Campeche</i>	Mexico	Down
<i>Frontera</i>	Mexico	Down
<i>Isla Mujeres</i>	Mexico	Contributing RTX
<i>Progreso</i>	Mexico	Down
<i>Puerto Morelos, Q. R.</i>	Mexico	Contributing RTX
<i>Sanchez Magallanes</i>	Mexico	Unknown
<i>Sisal</i>	Mexico	Unknown
<i>Tuxpan</i>	Mexico	Unknown
<i>Telchac</i>	Mexico	Down
<i>Veracruz</i>	Mexico	Unknown
<i>Montserrat</i>	Montserrat	Gap
<i>Corn Island</i>	Nicaragua	Unknown

<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	Removed
<i>Arecibo</i>	Puerto Rico	Contributing RTX
<i>Culebra Island</i>	Puerto Rico	Contributing RTX
<i>Fajardo</i>	Puerto Rico	Unknown
<i>Isabel II, Vieques</i>	Puerto Rico	Down
<i>La Esperanza, Vieques</i>	Puerto Rico	Contributing RTX
<i>Magueyes Island</i>	Puerto Rico	Contributing RTX
<i>Mayagüez</i>	Puerto Rico	Contributing RTX
<i>Mona Island</i>	Puerto Rico	Contributing RTX
<i>San Juan</i>	Puerto Rico	Contributing RTX
<i>Yabucoa</i>	Puerto Rico	Down
<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	Planned
<i>Soufriere</i>	St. Lucia	Planned
<i>Vieux Fort Bay</i>	St. Lucia	Planned
<i>Ganter's Bay</i>	St. Lucia	Contributing RTX
<i>Calliaqua (Coast Guard Base)</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	<u>Unknown</u>
<i>Port Of Spain</i>	Trinidad and Tobago	Contributing RTX
<i>Scarborough</i>	Trinidad and Tobago	Down
<i>Toco Trinidad</i>	Trinidad and Tobago	Unknown
<i>Point Galeota</i>	Trinidad and Tobago	Removed
<i>Point a Pierre</i>	Trinidad and Tobago	Planned
<i>Grand Turk</i>	Turks and Caicos	Existing
<i>Sapodilla Bay, Providenciales</i>	Turks and Caicos	Existing
<i>Charlotte Amalie, St. Thomas</i>	USVI	Contributing RTX
<i>Christiansted Harbor, St. Croix</i>	USVI	Contributing RTX
<i>Lameshur Bay, St. John</i>	USVI	Contributing RTX

<i>Lime Tree Bay, St. Croix</i>	USVI	Contributing RTX
<i>Aves Island</i>	Venezuela	Gap
<i>Punta Arenas, Margarita Island</i>	Venezuela	Gap
<i>La Guaira</i>	Venezuela	Existing

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