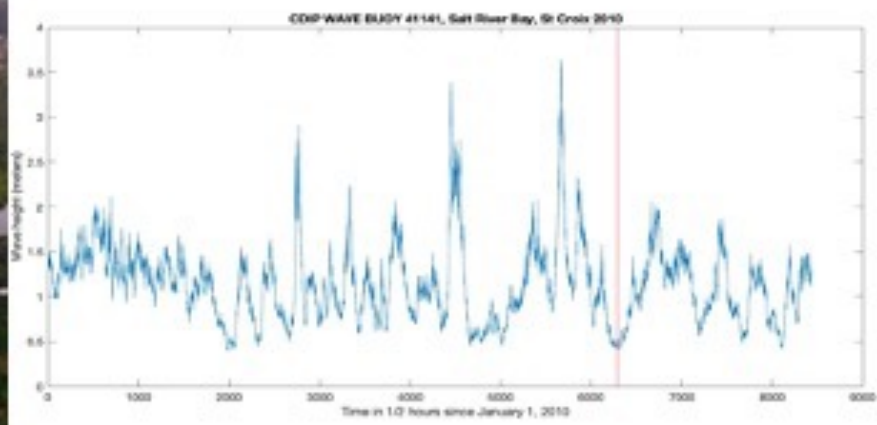




USVI Harbors and Ports

Roy A. Watlington, Member, CARICOOS Board of Directors
February 28, 2023, San Juan, Puerto Rico



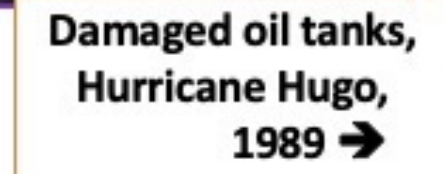
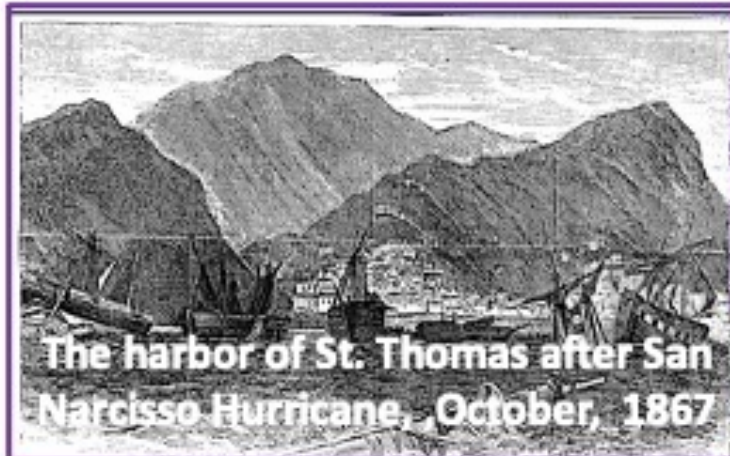


Profile of the US Virgin Islands 2023

Dependency of the US since 1917 (formerly Danish West Indies)	March 31, 1917
Population (down 4% from 2000)	> 104,000
Gross Domestic Product (down from 2007)	~ \$4.20 Billion
Air and cruise ship passenger arrivals annually	> 1.4 Million



The storied ports and harbors of the US Virgin Islands



Development of the DWI and USVI has always been linked to the use of its harbors

Christiansted Harbor, circa 1800



Naval Air Station, circa 1944



Subbase → Crown Bay



Pre-revolt Coal Women Workers



Creque Marine Railway



Christiansted, St. Croix

- Partly protected by fringing reef
- Formerly the Capital City of the Danish West Indies
- Fort Christiansvaern and considerable European colonial architecture
- Facilities for commuter seaplanes
- Ferries to St. Thomas and to Buck Island
- CO-OPS Water-level station 9751364
- Marinas, recreational boating, sport fishing charters, dive shops
- WAPA power plant with Reverse Osmosis desalination intake
- Proximity to large hotels and a well developed commercial downtown
- US Coast Guard's Marine Safety Detachment reports to the Captain of the Port in San Juan



Frederiksted, St. Croix

- Deep water port though unsheltered from the open ocean to the west
- Established cruise ship dock
- Frederiksfort (Fort Frederik) as well as considerable European colonial architecture
- Historic setting for key anti-colonial events
- Site of the *USS Monongahela* beaching
- Recreational boating, sport fishing charters, dive shops, small hotels
- US Coast Guard's Marine Safety Detachment reports to the Captain of the Port in San Juan



Photo # NH145208 Monongahela ashore



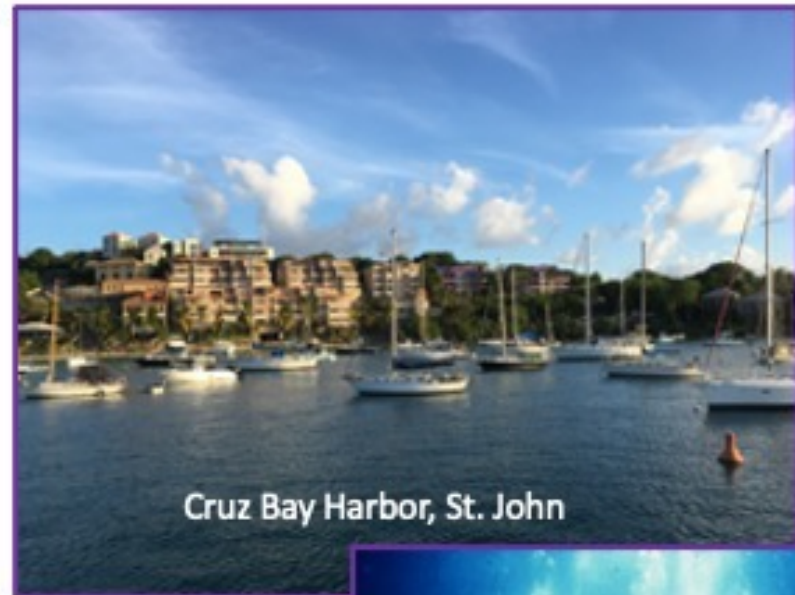
Krause Lagoon/ Limetree Bay /Hovensa / Gordon A. Finch Molasses Pier, St. Croix

- Geographically the former site of the largest mangrove stand in the USVI
- Was the site of Hovensa Oil refinery, a joint venture between [Hess Corporation](#) and [PDVSA](#), which peaked at 650,000 bpd; it was one of the 10 largest refineries in the world at the time,
- Tankers import molasses for the Virgin Islands rum industry, as well as asphalt, gravel, and other construction materials.
- Accommodates cable-laying vessels that lay and repair intercontinental submarine telephone cables and is planned to replace the cargo operations from Gallows Bay.
- CO-OPS met station 9751401
- US Coast Guard's Marine Safety Detachment reports to the Captain of the Port in San Juan.



Cruz Bay/Coral Bay/ Lameshur Bay St. John

- St. John is home to the US National Park Service's Virgin Islands National Park.
- Cruz Bay harbor offers ferries to St. Thomas and the British Virgin Islands as well as recreational boating, sport fishing charters, dive shops, camp grounds and hotels
- Coral Bay was the site of earliest European colonization and the starting place of the 1733 rebellion
- Lameshur Bay was the site of Tektite I and Tektite II - the NOAA/ Navy/ NASA/GE underwater habitat program, 1969-1970
- Lameshur Bay is the site of CO-OPS 9751381
- US Coast Guard's Marine Safety Detachment reports to the Captain of the Port in San Juan



Cruz Bay Harbor, St. John



Tektite I, Lameshur Bay, 1969

Charlotte Amalie, St. Thomas

- Seat of US Virgin Islands Government
- Sheltered deep water port
- Made the Danish West Indies competitive because of harbor characteristics, coaling station, marine railway & carenage.
- Established WICO and Port Authority cruise ship docks and docks for ferries to BVI, St. Croix and St. John
- Well-served by CO-OPS met station (CO-OPS 9751639)
- Home of historic Fort Christian (1671) as well as considerable European colonial architecture
- Historic setting for key anti-colonial and pro-labor events
- Site of the major vessel carnage of San Narciso hurricane (1867)
- Recreational boating, sport fishing charters, dive shops, small hotels
- US Coast Guard's Marine Safety Detachment (stationed in St Thomas) reports to the Captain of the Port in San Juan.



Crown Bay, St. Thomas

- Site of the US Navy submarine base in WWII
- Berthing depths 28 to 37 feet
- Hosted the world's largest cruise ship ("Wonder of the Seas" in 2022)
- Site of CARICOOS ocean/met sensors perhaps to become CO-OPS 9751749



Royal Caribbean Cruise ship *Wonder of the Seas* docks in Crown Bay, St. Thomas, March 22, 2022 (Michael Weichman, *St Thomas Source*)

In your region and/or nationally, what NOAA products, data, and services are valued by your organization and how beneficial are these products, data, and/or services?

- Inclusion in major NOAA programs has done much to support the economy, health and well-being of the Virgin Islands while protecting the environment”
 - Major inclusions: NOAA-CZM and NOAA Sea Grant
 - NOAA support for local Fish & Wildlife
- Charts – Office of Coastal Survey
 - The marine industry as well as pleasure sailors are heavily dependent
- CO-OPS – access to live and archived meteorological and ocean data useful on every level from academics to governmental decision makers to hurricane-anxious residents
 - Improved tide gauges with sampling scaled down from climate-level resolution
- NOS-IOOS–CARICOOS – stakeholder-motivated observations and data access easily accessible avenues to meteorological and ocean data
- Renewed awareness of the importance of expertise in marine technology, physical oceanography, data management.



MAXIMUM Wind Speeds and Wind Gusts – PR & USVI

DATA courtesy of WEATHERFLOW and CARICOOS

9/6/2017

IOOS/CARICOOS instruments served the nation in providing essential data

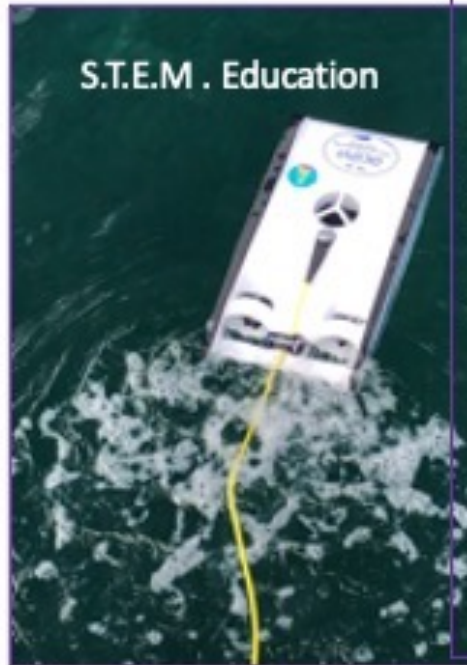
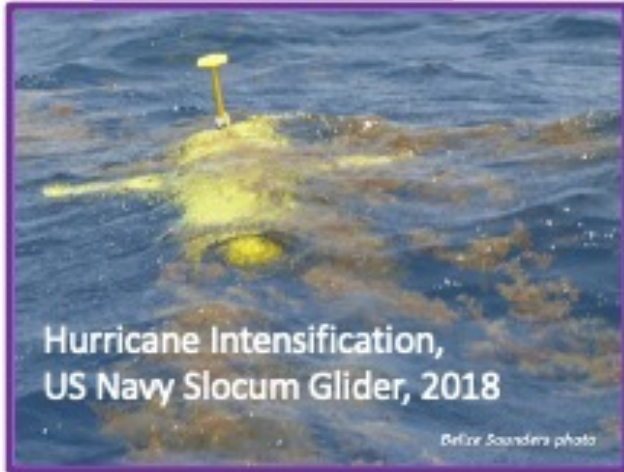
Some instruments may have failed before experiencing the true maximum

Met station data provided by WeatherFlow®

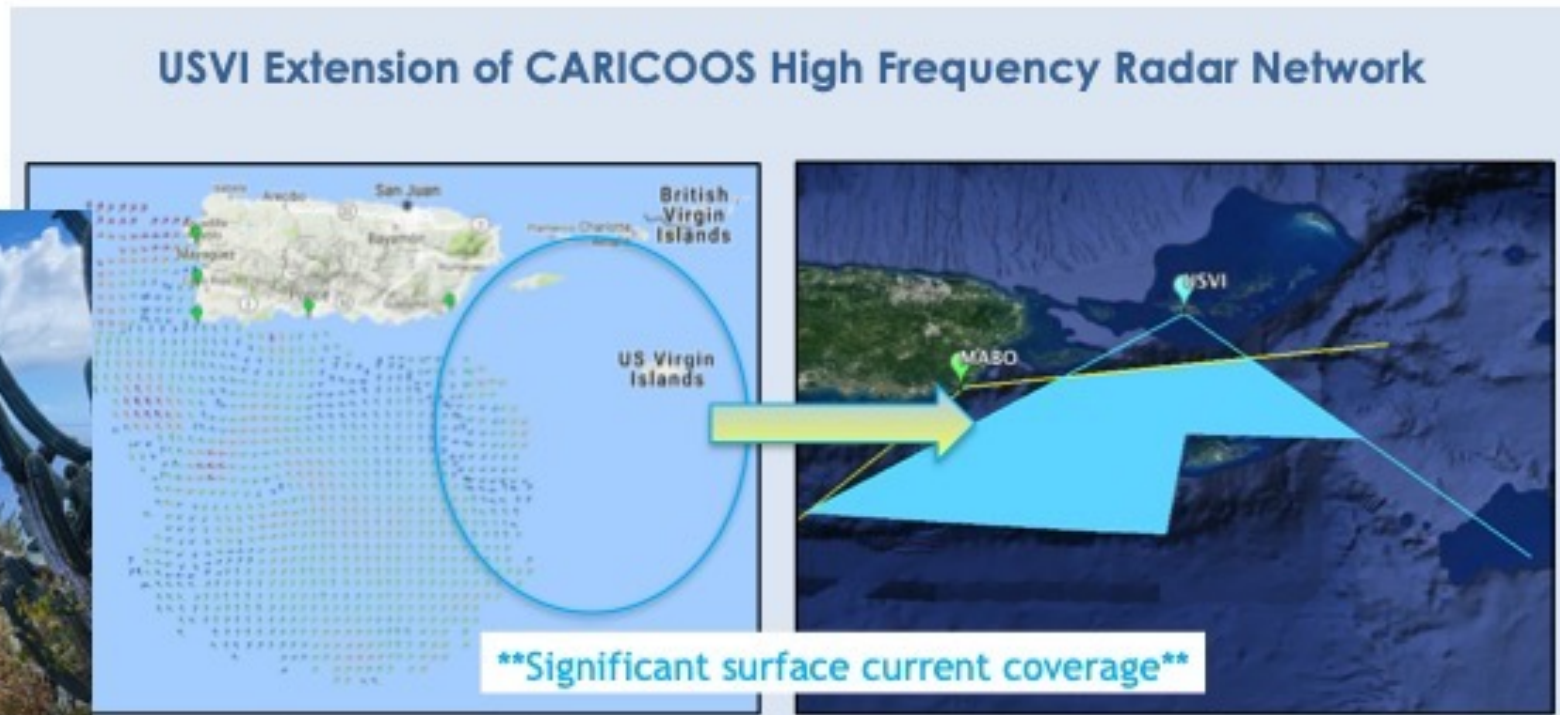
<u>Weather Station Location</u>	IRMA	IRMA	MARIA	MARIA
	Maximum Wind Speed	Maximum Wind Gust	Maximum Wind Speed	Maximum Wind Gust
	(mph)	(mph)	(mph)	(mph)
<u>Buck Island, St. Thomas</u>	105.6	➔ 140.9 ➔	Tower overturned	
<u>Isla Culebrita Light, PR</u>	102	118.7	124.4	➔ 138 ➔
<u>Rupert Rock, St Thomas</u>	89.3	➔ 132.8 ➔	45.3	64.7
<u>Savana Island, St. Thomas</u>	68.9	95.7	Silenced	*
<u>VI CARICOOS Buoy (St. John)</u>	55.9	76.1	47	64.9
<u>VI CARICOOS Buoy (St. Thomas)</u>	55.2	73.6	Silenced	*
<u>PR CARICOOS Buoy (Vieques)</u>	49.2	62.6	62.6	73.8
<u>PR CARICOOS Buoy (San Juan)</u>	44.7	60.4	58.2	76.1
<u>San Juan, PR NAVAID</u>			91	109.6
<u>Sandy Point NWR, St. Croix</u>	44.5	59.1	115.9	➔ 137.3 ➔
<u>Las Marias, Guayama, PR</u>	49	54	47.5	69

Advancing IOOS/CARICOOS goals and programs locally

Addressing IOOS focus areas, asset stewardship, outreach and education



Facilitating major CARICOOS-focused observations in the USVI



What new or enhanced products, data, or services would you like NOAA to offer, and how would your organization or sector benefit from them?

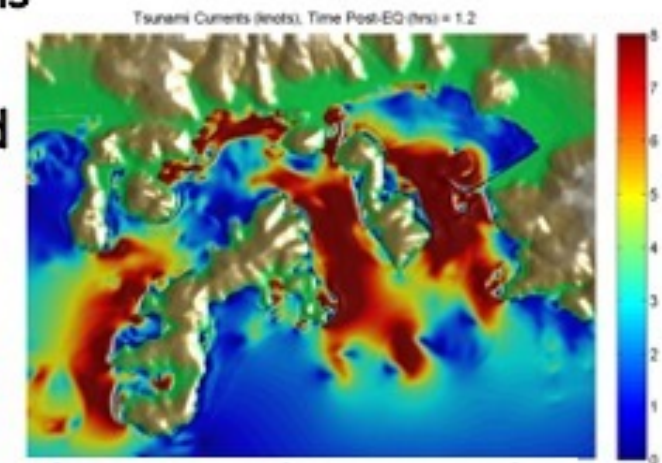
First, USVI one-item SWOT:

- **Strength** = a progressive relationship with NOAA through NOS/IOOS/CARICOOS as well as through SeaGrant, CZM etc.
- **Weakness** = Insufficient local technical and scientific human capital – exacerbated by a “brain drain”
- **Opportunity** = Meaningful expanded participation in NOAA programs
- **Threat** = overturning of personnel and leadership on every level, including the federal, as well as transience of federal foci.



What new or enhanced products, data, or services would you like NOAA to offer, and how would your organization or sector benefit from them?

- Continual improvement of Vdatum to support improved NGDC Digital Elevation Models
- Facilitate decision-making in crucial matters (e.g., Where to dump spoils from harbor dredging)
- Assist the US Coast Guard in expediting its determinations to open closed harbors and ports after storms
- Assist VITEMA via the NTHMP in developing updated and focused maritime guidelines for facing tsunami threat
- Assist VITEMA via the NTHMP in completing tsunami current modeling such as initiated by P. Lynette.





St. Thomas

Water Island

St. John

Thank You!

St. Croix



Photo credits

- Patt Meara in 1965 (Facebook photo)
- GoToStCroix.com for Salt River photos
- VITEMA, Tsunami Evacuation Maps, <http://www.vitema.vi.gov/plan-prepare/tsunamis>
- NH 45208 Monongahela Ashore, US Naval Archives 1868
- Creque Marine Railway by Gruedig - Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=12142989>
- Pat Lynette, Tsunami current modeling, Charlotte Amalie Harbor, 2015
- Danish Maritime Museum, Christiansted Harbor, circa 1800
- Michael Weichman, *St Thomas Source (photo, Wonder of the Seas, 2022)*
- Michael Hatfield "Professional Boatbuilder" (*QE IV photo*)