



Mangrove Forests

Coastal Green Infrastructure of the US Virgin Islands



Mangroves in the USVI

- Mangrove forests in the Virgin Islands are the first the first level of defense in storm surge in hurricanes and mitigate inland flooding from heavy rains
- Shore stabilization
- Fisheries
- Wildlife

Photo by Caroline Rogers

Spatial Data Sources

The screenshot shows the NOAA National Centers for Coastal Ocean Science (NCCOS) website. The search results for 'mangrove' are displayed, showing 19 projects, 10 news items, 10 products & data items, 1 general page, and 0 internships. Below the summary, there are four project cards with 'Read More' links:

- Acoustic Tracking of Fish Movements to Support Habitat...**
We are monitoring the movement and residence time of fish in several coastal ecosystems. Our objectives are to document habitat preferences of fish, the timing and scales of their mobility, and ...
- Baseline Assessment of Guanica Bay, Puerto Rico In...**
We completed a baseline assessment of the environmental conditions in Guanica Bay, Puerto Rico, to help coastal managers identify the most appropriate restoration projects, and their effectiveness, in support of ...
- Baseline Assessment of Contaminants and Ecological...**
We studied the water contaminant levels in the bay and the coral reef ecosystems just outside to develop a baseline environmental assessment of water quality and living marine resources of ...
- Benthic Habitat Mapping for Buck Island Reef Natio...**
Summary: We developed benthic habitat maps for the Buck Island Reef National Monument, north of St. Croix in the U.S. Virgin Islands. The bathymetry (depth) data we collected was used ...

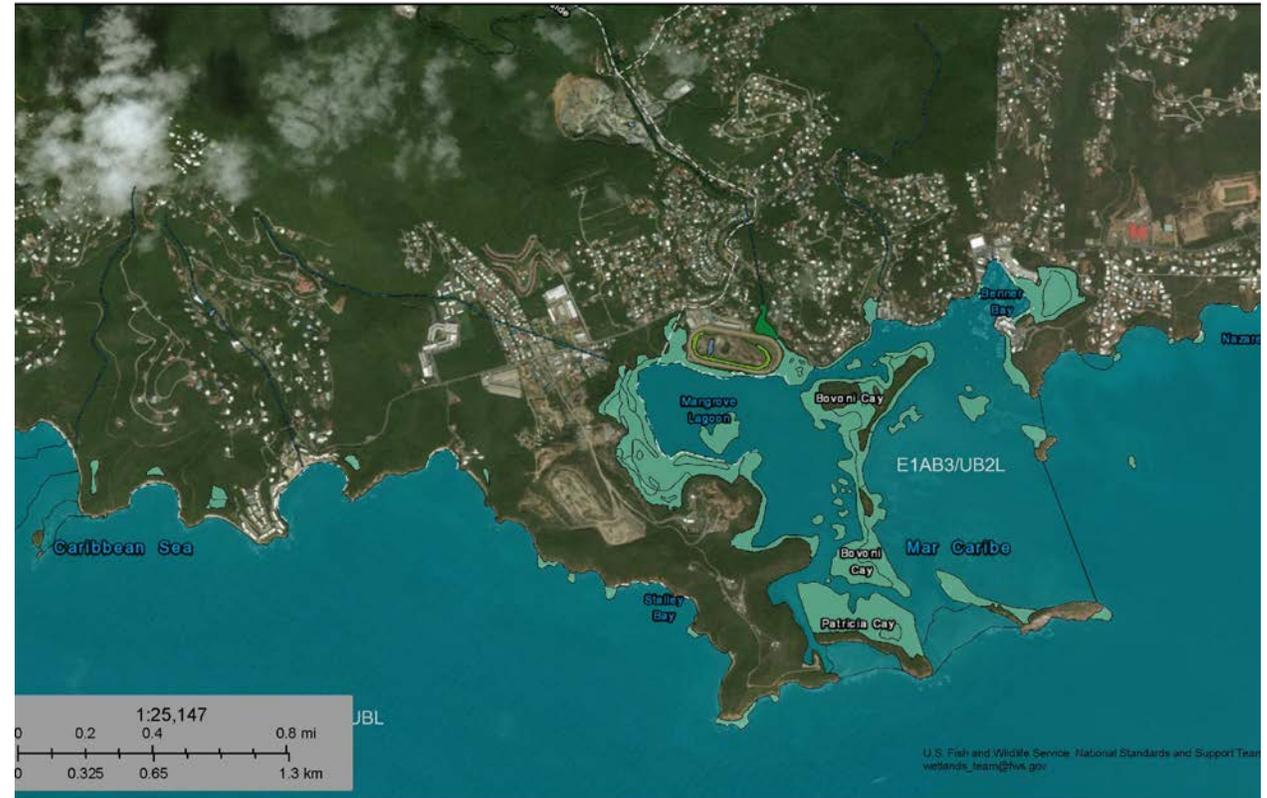
- NOAA Benthic layer for VI
- NOAA NCCOS
- NOAA CROP Data Portal

Spatial Resources

- Resources such as the FWS wetland mapper are best when used at a larger scale
- US Forest Service – International Institute of Tropical Forestry landcover classification map is excellent and has a mangroves forest cover class



FWS Wetland in st thomas



August 16, 2019

Wetlands

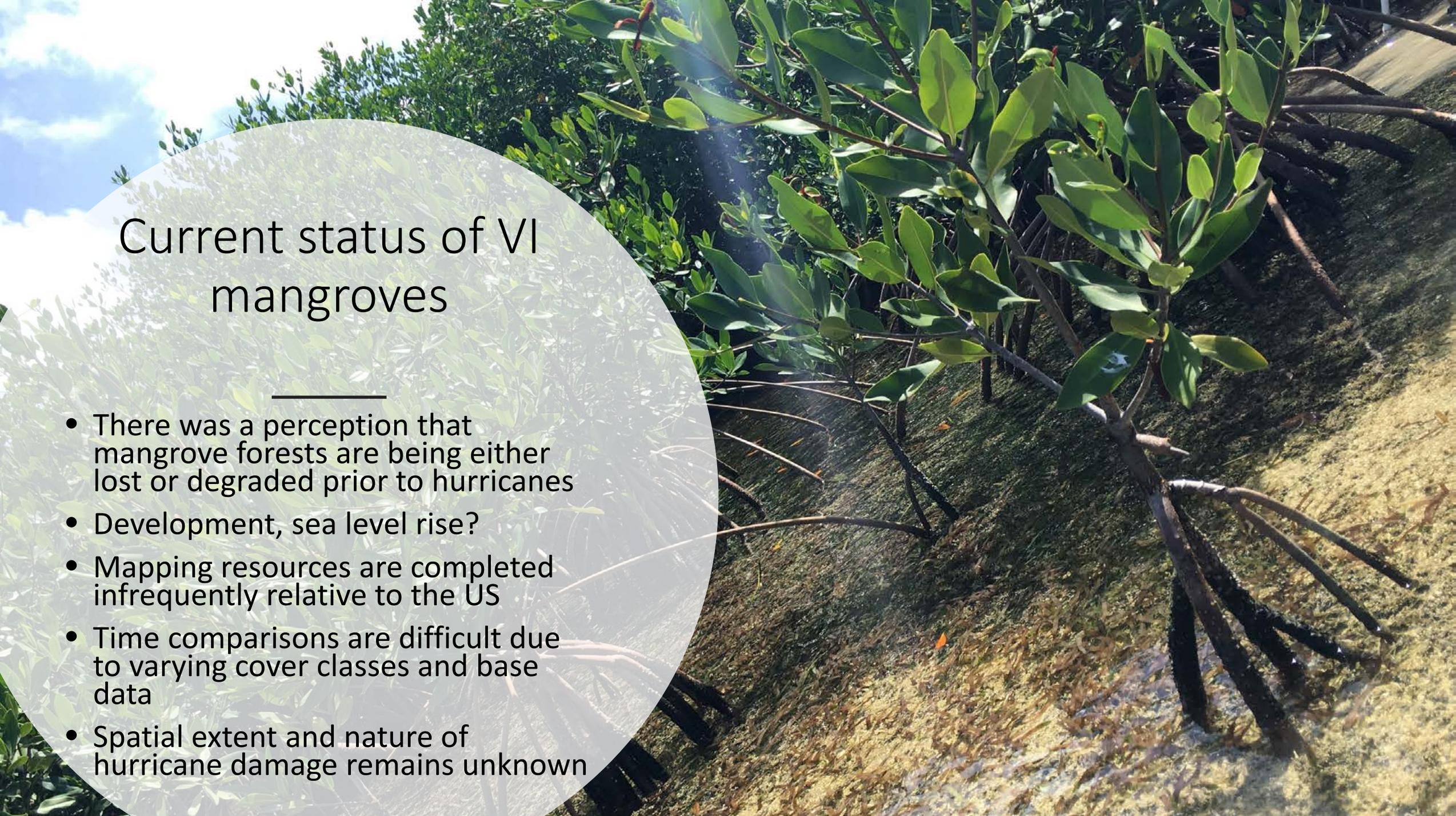
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands-related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory
This page was produced by the

A photograph of a mangrove forest with a semi-transparent circular overlay containing text. The background shows lush green mangrove trees with prominent prop roots extending into a shallow, muddy waterway. The sky is blue with some clouds. The text is centered within the circle.

Current status of VI mangroves

- There was a perception that mangrove forests are being either lost or degraded prior to hurricanes
- Development, sea level rise?
- Mapping resources are completed infrequently relative to the US
- Time comparisons are difficult due to varying cover classes and base data
- Spatial extent and nature of hurricane damage remains unknown

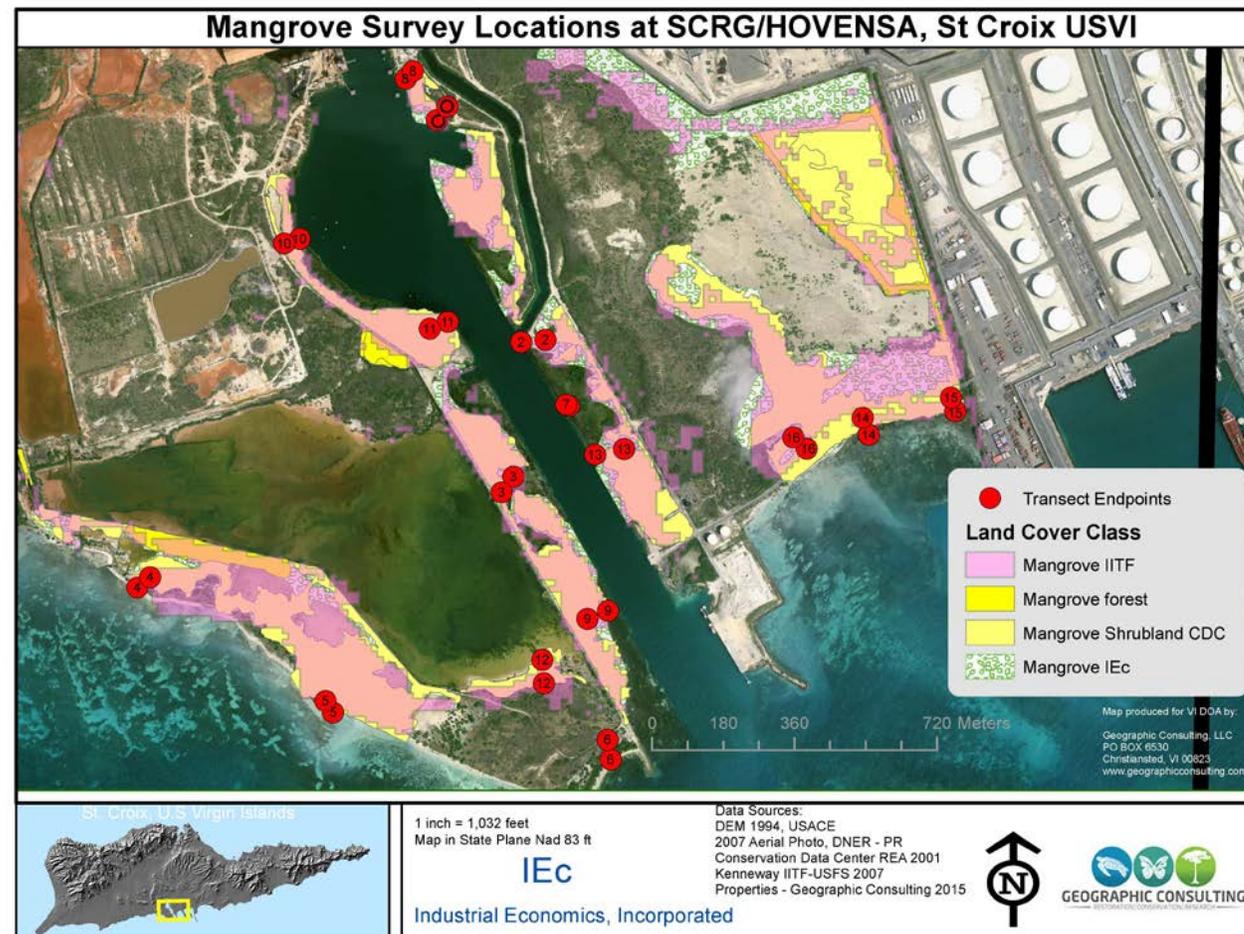
Uncertain status of mangrove forests

- Hurricanes Irma and Maria caused widespread damage.
- Mortality and damage dynamics appear complex and variable
- Red mangroves may have been more severely effected
- Mangrove Mortality may be higher than in upland forests and recovery slower
- Are we ready for another major storm?



Resources moving forward; example projects

- Several field studies completed in the VI
- Sampling methods have been field tested and evaluated for cost
- Perpendicular transects were used to measure the change in species composition



Great Pond & SCRG/Lime Tree Field study

- Multiple mangrove base layers combined to create study site in GIS
- Random point generation for transect locations
- Transects are perpendicular to the coastline
- Overstory; Height, canopy density, health...
- Understory; seedling density, species, size class



Great Pond used as a comparative reference

South Shore Industrial Complex - Coastal Marine Environment Baseline Assessment, St. Croix, USVI

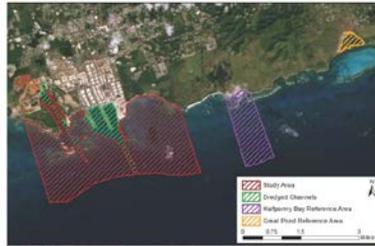
Data collection efforts to assess the current marine environment adjacent to the former Hovensa facility.

SUMMARY

Environmental conditions were assessed in the "study" and "reference" areas focusing on three primary habitat categories: benthic habitat, mangroves, and dredged channels. In the study area off the South Shore Industrial Complex, both benthic and shoreline mangrove habitats were assessed. Two reference areas were assessed for comparative purposes with the Study Area: Halfpenny Bay for benthic habitat and Great Pond for mangroves. Mangroves were assessed for habitat health along transects from the edge of the water up to 50 meters inland. Benthic habitats were assessed along 15 meter transects for seagrass, corals, or non-vegetated bottom habitat. Sediment chemistry was analyzed at select benthic habitat sites and all dredge channel sites. Water quality measurements were taken at all benthic habitat and dredge channel sites. Characterizing the current condition of the nearshore marine environment within the Study Area will help establish an understanding of the baseline condition of habitats and natural resources prior to operation of the Limestone Bay Terminals as a petroleum storage facility.

DATABASE

All data collected during this study are available in an Access Database titled Hovensa Marine Baseline Database. Raw data and summary data can be accessed by clicking buttons for predefined data categories of mangroves, benthic habitat, sediment chemistry, water quality, and fish data. Additionally, all data collected at a specific site are available via a separate query button.



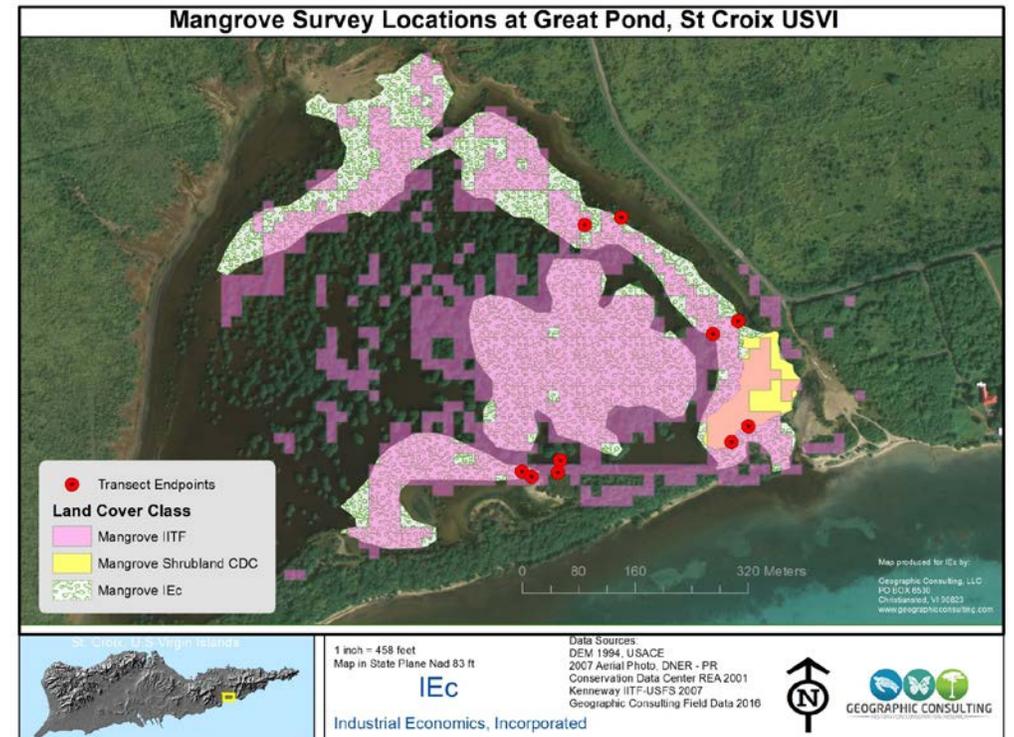
Map of Study Area and Reference Areas



Benthic habitat and dredge channel sampling sites in the Study Area and Halfpenny Bay Reference Site



Mangrove sampling sites in the Study Area and Great Pond Reference Site

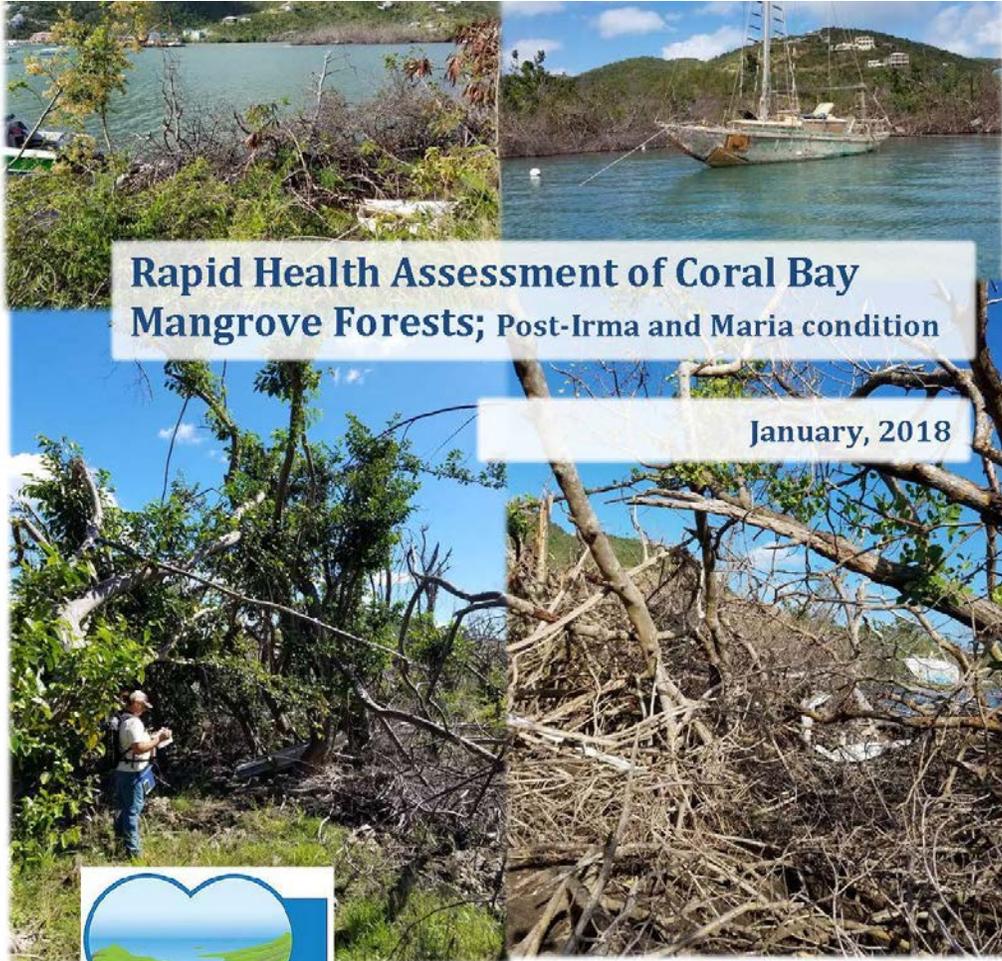


Coral Bay - Mangroves Survey (January 2018)



Post Hurricane Rapid Assessment of Coral Bay

- Rapid sampling methods assessed damage across the entire bay
- Canopy cover, ground cover, tree damage and regeneration were recorded



**Rapid Health Assessment of Coral Bay
Mangrove Forests; Post-Irma and Maria condition**

January, 2018

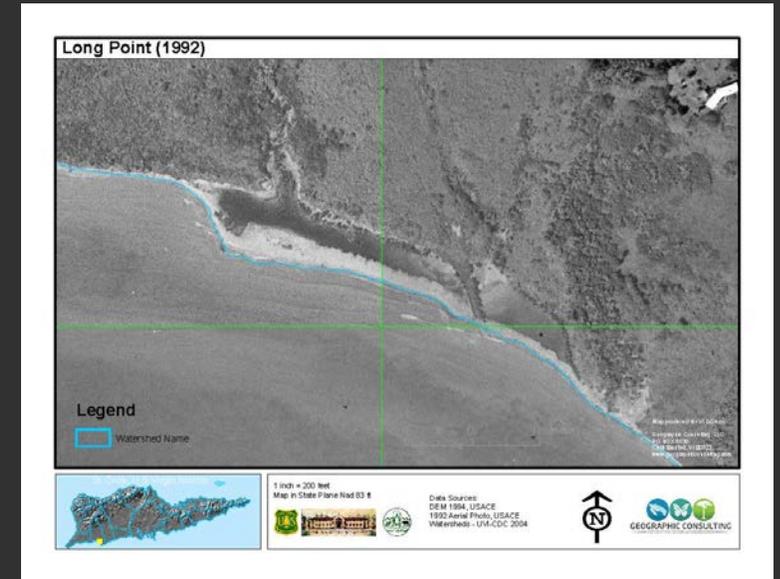


Coral Bay, St John Coral Bay Community Council

- All sample sites had tree damage over 50% recorded
- Damage of 100% recorded at several sample point
- Red mangroves, showed a higher degree of damage and few signs of regeneration
- Regeneration from propagules was widespread in some sample sites
- Recommendations and results were distributed to the Coral Bay community

Proposed Long Point Mangrove Restoration

- Mangrove pond lost and coastline receded over 80 feet in some location
- Comparison does not include Maria Damage
- Geographic Consulting and Reef Ball proposed partial solution with green infrastructure
- *Phase 1 is ramping up a tree nursery!*



What is needed?

- New resource mapping, including benthic layers for the VI
- Systematic Field Assessment of conditions in key mangrove systems across the territory
- Uniformity in sampling methods
- Defining cause of damage and future threats
- Develop restoration plans for impacted systems
- Prioritize action based on both cost and the value of individual mangrove systems





What are the challenges?

- Funding sources are always a challenge
- A clear path for restoration permitting (US and VI) that can be repeated
- *Tree nurseries need time to produce mangroves and other coastal trees for the restoration projects*