United States Virgin Islands
Coastal Zone Management Program
SECTION 309 ASSESSMENT AND STRATEGY

FY 2023 to 2025

USVI Department of Planning
and Natural Resources
Division of Coastal Zone Management

December 2022

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For more information about this report please contact the USVI Division of Coastal Zone Management at 340-774-3320.

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ACRONYMS

A&S	Assessment and Strategy
BMP	Best Management Practice
CLWUP	Comprehensive Land and Water Use Plan
CMP	Coastal Management Program
CRCP	Coral Reef Conservation Program
CVI	Coastal Vulnerability Index
CZM	Division of Coastal Zone Management
CZMA	Coastal Zone Management Act
DFW	Division of Fish and Wildlife
DPNR	Department of Planning and Natural Resources
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HMRP	Hazard Mitigation and Response Plan
MDP	Marine Debris Program
MPA	Marine Protected Area
NOAA	National Oceanic and Atmospheric Administration
SLR	Sea Level Rise
STEER	St. Thomas East End Reserves
TCRMP	Territorial Coral Reef Monitoring Program
USVI	United States Virgin Islands
UVI	University of the Virgin Islands
VICZMA	Virgin Islands Coastal Zone Management Act
VI EPSCoR	VI Established Program to Stimulate Competitive Research
WAPA	Water and Power Authority

INTRODUCTION

The Coastal Zone Enhancement Program encourages state and territorial coastal management programs to strengthen and improve their federally approved coastal management programs in one or more of nine areas. These "enhancement areas" include wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management plans, ocean and Great Lakes resources, energy and government facility siting, and aquaculture. The enhancement program was established in 1990 under Section 309 of the Coastal Zone Management Act (CZMA), as amended.

Every five years, states and territories are encouraged to conduct self-assessments of their coastal management programs to assess the effectiveness of existing management efforts, identify priority management needs, and determine enhancement opportunities within each of the nine enhancement areas. Coastal management programs then work with NOAA to develop strategies to implement a program change or changes that focus on one or more of the priority enhancement areas. Program changes can be a change to coastal zone boundaries; new or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement; new or revised local coastal programs and implementing ordinances; new or revised coastal land acquisition, management, and restoration programs; new or revised special area management plans or plans for areas of particular concern, including enforceable policies and other necessary implementing mechanisms; or new or revised guidelines, procedures, and policy documents that are formally adopted by a state or territory.

The Virgin Islands Coastal Zone Management Act (VICZMA) was established in 1978 (V.I. Code tit. 12, §901). The entirety of the United States Virgin Islands (USVI) is within the coastal zone, however all USVI lands, excluding federal lands, are managed through a two-tier system. This two-tier system has different requirements for development depending on the tier. The first tier defines those areas with the strongest relationship to coastal waters and extends to the limits of the territorial sea and includes all offshore islands and cays. The landward extent of the first tier is drawn along biophysical features (ridge lines and contours) and administrative features (property lines, roads, districts, etc.). While responsibility to implement the VICZMA is shared across various territorial agencies, the Department of Planning and Natural Resources (DPNR) Division of Coastal Zone Management (CZM) is the entity directly responsible for implementation and enforcement of the USVI's coastal management program.

All state and territory Coastal Management Programs (CMPs) must complete an approved Assessment and Strategy (A&S) to be eligible for Section 309 funding in FY 2021-2025. This A&S has been prepared in order that the USVI's DPNR CZM program may be eligible for §309 funding in FY 2023-2025. If approved by NOAA, a state or territory can use its §309 funds over three years to achieve the program changes identified in the strategy(ies). Funds can be used for personnel, contracts, equipment, travel supplies, etc. necessary to develop the program changes. Section 309 funds cannot be used for earth moving or shovel-in-ground projects. Section 309 funds can be used for up to two years for staff and resources to implement a program change once that program change has been submitted to and approved by NOAA.

This document includes a high-level assessment of each of the nine enhancement areas within the territory and identifies the relative priority and importance of each area in consideration of the USVI's

approved coastal management program, existing conditions, and anticipated program changes and implementation activities eligible for funding under §309. The following A&S was developed pursuant to §309 of the CZMA. This document is structured to conform to CZMA §309 Updated Program Enhancement Guidance issued by the NOAA Office for Coastal Management covering the period FY2021-2025, utilizing the NOAA-provided template. For clarity, color is used to delineate the difference between the template provided for coastal programs and USVI CZM responses. **Template text is printed as black font**, and **USVI CZM responses are printed in blue font**.

Development of the USVI §309 Assessment and Strategy

CZM led the development of the A&S with the assistance of a consultant hired to provide technical assistance in the gathering of information and drafting and editing of the document. The USVI CZM §309 Assessment was developed based on research, and information provided by CZM, other territorial and federal resource management agencies, CZM partners including those in academia, non-governmental organizations, and the private sector, as well as the public. CZM identified and solicited input from key stakeholders through an online questionnaire. The stakeholders provided feedback on the relative prioritization of enhancement areas, critical problems affecting those areas, and the management needs and opportunities for CZM to strengthen them. A summary of stakeholder feedback is provided in Appendix I.

The USVI §309 Strategy was developed based on enhancement area priorities, management priorities and needs identified in the Assessment, and discussion among CZM, DPNR, and NOAA partners during an in-person workshop and meetings in August 2022. Considerations of past, and present CZM directions and initiatives, CZM program capacity, CZM staff capabilities, and CZM expertise and core functions were significant factors in developing the Strategy. The Strategy was also heavily influenced by the devastating impacts of and lessons-learned from the two Category-5 major hurricanes, Irma and María, that impacted the territory in a span of two weeks in 2017. The final USVI §309 Strategy is comprised of specific, realistic, and impactful actions that can be completed over the next three years.

The public was provided an opportunity to review and provide comments on the draft USVI §309 A&S concurrently with the NOAA review of the draft from October 28, 2022, through November 26, 2022. CZM provided notice of the public review period on their website, on the DPNR Facebook page, and shared it to multiple popular community Facebook groups. A digital copy of the draft document was posted on the CZM website, and hard copies were available in CZM's offices. CZM received 10 sets of comments on the draft §309 A&S. A summary of these comments and CZM's responses to them are provided in Appendix II.

Executive Summary of the 2023-2025 USVI §309 Assessment and Strategy

The Assessment was informed by input from key stakeholders combined with an internal characterization of each enhancement area, current and projected threats to each enhancement area, and the management characterization of each by CZM and DPNR staff. Of the nine enhancement areas, CZM identified the conservation of wetlands, mitigation of coastal hazards, and improvement of public access to the coast as the highest priorities for action in the 2023-2025 USVI §309 Assessment. The following table summarizes the 2023-2025 §309 Assessment.

Summary of USVI §309 Assessment Priorities for FY2023 - 2025

Enhancement Areas	Phase 1 Priority	Phase 2 Assessment (Y/N)	Develop Strategy (Y/N)
Wetlands	**High**	**Yes**	No
Coastal Hazards	**High**	**Yes**	**Yes**
Public Access	**High**	**Yes**	No
Marine Debris	Low	No	No
Cumulative and Secondary Impacts	Medium	No	No
Special Area Management Planning	Low	No	No
Ocean Resources	Medium	No	No
Energy & Government Facility Siting	Low	No	No
Aquaculture	Low	No	No

Based on the in-depth (Phase II) assessment, agency capacity, and likely available §309 formulary funding, CZM chose to develop one strategy focused on reducing and mitigating impacts from coastal hazards. The proposed strategy will improve the CZM permitting process to increase community and coastal resource resilience to coastal hazards and reduce the negative impacts associated with them. Permit application and review processes will be updated to require consideration of the most current information on coastal hazards and climate impacts affecting both Tier 1 and Tier 2. The strategy builds upon new and ongoing research into territorial vulnerabilities to coastal hazards and lessons-learned from the 2017 hurricane season. Improving and updating the CZM permit process to effectively address coastal hazards will also directly or indirectly result in benefits for, and address needs identified in, other high- and medium-priority enhancement areas including wetlands, public access, cumulative and secondary impacts, and ocean resources. The proposed strategy and its implementation will lead to significant program changes by improving CZM policy and procedures that will result in near- and longer-term improved outcomes for the community and territorial coastal resources.

SUMMARY OF PAST §309 EFFORTS

The last approved §309 A&S for the USVI was from the 2006-2010 cycle. The USVI did not receive §309 funds for the most recent assessment period, therefore there are no §309 projects to report in this section of the A&S. However, since the last assessment period there have been several initiatives and projects relevant to the §309 enhancement areas. Summaries of those have been included in the respective enhancement area sections of this document.

ASSESSMENT: PHASE I

Wetlands

Section 309 Enhancement Objective: Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands. §309(a)(1)

Note: For the purposes of the Wetlands Assessment, wetlands are "those areas that are inundated or saturated at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." [33 CFR 328.3(b)].

Phase I (High-Level) Assessment:

Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Using provided reports from NOAA's Land Cover Atlas,[1] please indicate the extent, status, and trends of wetlands in the state's coastal counties. You can provide additional or alternative information or use graphs or other visuals to help illustrate or replace the table entirely if better data are available.

Current state of USVI wetlands in 2012 (acres): 19,455

Coastal Wetlands Status and Trends[1]

Change in Wetlands	From 2003-2007	from 2007 – 2012*
Percent net change in total wetlands (% gained or lost)	0.23%	1.17%
Percent net change in freshwater (palustrine wetlands) (% gained or lost)	-1.24%	-007%
Percent net change in saltwater (estuarine) wetlands (% gained or lost)	3.43%	3.99%

**USVI data is only available through 2012. The next C-CAP update for the territory will not be available until 2023.*

[1] https://coast.noaa.gov/digitalcoast/tools/lca.html. Note that USVI territorial data is only available through 2012. The next C-CAP update for the territory will not be available until 2023.

How Wetlands Are Changing[1]

Land Cover Type	Area of Wetlands Transformed to Another Type of Land Cover between 2003-2007 (acres)	Area of Wetlands Transformed to Another Type of Land Cover between 2007-2012* (acres)
Development	-1.42	-4.23
Agriculture	1.99	0.0
Barren Land	-0.91	-0.78
Water	12.7	29.07

**USVI territorial data is only available through 2012. The next C-CAP update for the territory will not be available until 2023.*

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of coastal wetlands since the last assessment to augment the national data sets.

There are no consistent monitoring programs, nor any comprehensive local trend data for USVI wetlands. Several project-specific efforts have been conducted that provide data for specific wetland areas for a particular point in time. As part of some projects, the distribution or extent of wetland areas has been documented, and where there are differences from a reference point in the past, that change has been noted. Additionally, data on changes to wetlands exists within specific CZM permit files, but this information is not currently compiled or consolidated into an easily accessible format. A large volume of spatial data on territorial wetlands exists from these varied sources, however it is not managed in a way to maximize its use to inform effective management of these areas, nor is it widely available to agency staff or the public. There is a need to make this data more publicly available.

In many cases national- or global-level information on wetlands relies on remotely sensed data. Little of this remotely sensed data has been ground-truthed. The C-CAP data referenced above is based on remotely sensed aerial photography, and as noted status data is only available to 2012. It is likely those data do not accurately reflect the status of territorial wetlands.

CZM staff have indicated they are aware of changes occurring within territorial wetlands that are not reflected in the status charts above. Communication with CZM staff suggests that the land-use designation of certain coastal parcels may impede CZM's ability to regulate the fate of wetlands. A recent situation was described where a wetland parcel, designated as agricultural, adjacent to the Rainbow Beach parking area on St. Croix was converted to a cane field by the Department of Agriculture without CZM consultation. This example highlights a potential management need to clarify the CZM process for other land use designations to ensure wetlands are adequately protected.

The devastating impacts to the territory resulting from the 2017 hurricane season, and the post-hurricane recovery regulatory atmosphere also caused wetland changes throughout the USVI. Mangrove wetlands were impacted by storm surge and sustained 180 mph winds resulting in widespread mortality of trees and wildlife. Efforts are currently underway to document and characterize these post-hurricane changes at several wetland areas. The following is a summarized list

of projects and reports/plans that provide additional data on territorial wetlands since the last assessment:

- The VI Established Program to Stimulate Competitive Research (VI EPSCoR) has a Mangrove Ecosystem Function and Recovery program, which documents mangrove extent and condition over time and identifies areas in need of restoration. The goal of this program is to study the current and historic distribution, loss, and recovery of different mangrove species in the territory using archival maps and new technologies. This work will help to identify stressors and other factors influencing mangrove distribution, health, and function. The program also aims to develop science-based opportunities for restoration through field-testing restoration techniques and investigating factors influencing seedling success and resilience. Research focused on the St. Thomas East End Reserves' (STEER) mangrove lagoon[2] has documented high levels of contamination from copper, arsenic, zinc, DDT, silver, mercury, and tributyltin (which has been banned in the US since 1988 and globally since 2008 yet persists in the environment). The documented levels of contamination are sufficient to pose a threat to wildlife and to people who may consume seafood collected from this area. Research has also shown the importance of the mangrove system in acting as a buffer to prevent contaminants from moving into the outer lagoon of the MPA by trapping sediments and slowing upland runoff (Keller, et al., 2017). The contamination at STEER is also discussed in the Secondary and Cumulative Impacts section of the A&S.

- Geographic Consulting is compiling GIS data for wetland sites in St. Croix and St. Thomas. Historic data is being digitized, and includes information on wetlands, birds, and land changes. Once digitized this data will provide a preliminary assessment of wetland extent and condition prior to the 2017 hurricane season impacts.

- The Division of Fish and Wildlife is collaborating with partners to characterize the impact of Hurricanes Irma and Maria on territorial wetlands. Phase I, documenting wetland sites post-hurricane, and characterizing their condition is currently underway. Detailed surveys of wetland birds are also being conducted. This data will be compared to that from bird surveys from 20 and 40 years ago to identify changes and trends. Phase II will include the development of restoration concepts for impacted wetlands and recommendations on mangrove wetland areas to be prioritized for restoration, either engineered or natural. Detailed mangrove restoration plans and engineering designs will then be produced for prioritized sites.

- A series of watershed management plans were commissioned by CZM over the years for the east end of St. Croix, STEER, and Smith Bay. These plans include maps and other documentation for wetlands within the project areas. These plans provide past and present (at time of plan production) snapshots of wetlands, and document impacts to them from development within the different watershed project areas.

[2] https://static1.squarespace.com/static/57211eff59827e8a710f3c30/t/6151bdf4b7f6100ba9c6f9c0/1632747001861/%C6%92.Contamination+Infographic.pdf

- CZM has recently completed a project to develop management plans for eight high-priority watersheds. These plans will provide summary statistics on wetlands per watershed, including both coastal and terrestrial wetlands, and ghut habitats. This project is summarized in greater detail in the Coastal Hazards section of this document.

- The Global Mangrove Watch[3] online platform lists the extent of mangroves in the USVI at 2.06 km2, or a linear coverage of 9.73% of the 437.21 km coastline as of 2016. The extent of USVI mangroves decreased by 0.01 km^2 between 1996 and 2016. Remotely sensed data from 1996, 2007, 2008, 2009, 2010, 2015, and 2016 were used to calculate mangrove extent in the USVI. The Global Mangrove Watch maps are the official mangrove datasets used by the UN Environment Program for reporting on Sustainable Development Goal 6.6.1. Trends from the Global Mangrove Watch appear to differ from those derived from NOAA's C-CAP Land Cover Atlas, used to complete the Resource Characterization tables above, which highlights the need for consistent and comparable data-collection methods, ground-truthing of remotely sensed data, and of local monitoring and research efforts.

- NOAA Environmental Sensitivity Index maps are designed to provide a concise summary of coastal resources at risk in case of an oil spill or other disaster. They characterize coastal and estuarine shorelines for several wetlands classes and may be useful for resource characterization and assessment. The USVI data shows spatial extent of wetlands and mangroves and incorporates data layers from the National Wetlands Inventory discussed below. Information for the USVI can be viewed in the Environmental Response Management Application[4], which integrates and synthesizes various real-time and static datasets into an interactive map.

- The wetlands data layer in the Puerto Rico and U.S. Virgin Islands Wetland Inventory[5] is the product of over 45 years of work by the National Wetlands Inventory and collaborators to represent the extent, approximate location, and type of wetlands in the United States and its Territories. Most, if not all, the data identified for Territorial wetlands is based on 1-meter or less digital, true color imagery from 2007. The Division of Fish and Wildlife (DFW) has received funding from the U.S. Environmental Protection Agency to update the National Wetland Inventory for the USVI.

Management Characterization:

1. Indicate if there have been any significant changes at the state or territory level (positive or negative) that could impact the future protection, restoration, enhancement, or creation of coastal wetlands since the last assessment.

[3] See https://www.globalmangrovewatch.org
[4] See https://erma.noaa.gov/caribbean#/layers=35225+1496&x=-64.61550&y=18.20455&z=9.0&panel=layer
[5] See https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/

Significant Changes in Wetland Management

Management Category	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	N
Wetlands programs (e.g., regulatory, mitigation, restoration, acquisition)	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Although there have not been any significant changes to statute, regulations, policies, case law since the last A&S, draft regulatory material has been proposed, which if approved would result in improved ability to manage and regulate territorial wetlands. DPNR has collaborated with different legislators to revise and enhance the agency's permitting and enforcement capacity. Unfortunately, the legislation has stalled in committee and the senators who were championing these efforts are not current legislators.

Similarly, while there have not been any significant changes to wetland programs since the last A&S, the projects described in the resource characterization section have potential implications for the future management of territorial wetlands. Specifically,

- The VI EPSCoR work is identifying stressors that affect mangrove distribution, health, and function including contaminants. This program is also researching effective wetland restoration techniques. This information can be used to inform improved management of wetland areas including revised regulatory language and restoration efforts.
- Projects by DFW and partners are providing historical data on the past condition and extent of wetland areas, as well as data on their current state. This information can be used to inform management decisions about restoration and conservation, and to evaluate how effective policies intended to protect wetlands have been. A future component of this work will identify mangrove areas well-suited to restoration, prioritize sites, and develop restoration designs.
- The watershed management plans that have been, and are currently being, developed under CZM, document stressors and other factors that are negatively impacting wetland areas. The plans also offer solutions to mitigate problem areas and inputs. These plans provide information and engineering designs that can inform improved wetland management and policy.

In 2020 DPNR released a new management tool, the **USVI DPNR Hotline App,** for the public to anonymously report activities negatively affecting natural resources to DPNR. The DPNR Hotline App is

available for both iOS and Android devices. CZM staff indicate that the DPNR Hotline App has been very well-received by the public and that the public are using the app to report problems and potential violations. Implementation of the app within DPNR is varied, resulting in both a perceived and actual continued lack of response to reports. A total of 21 staff across DPNR divisions have been trained in the tool, but few log in to the system to review and respond to reports. CZM and DFW are the divisions that utilize the tool the most, and the CZM Director has used it to cite violations. CZM has also used the app to compile reports on sedimentation. The app could be a powerful tool to work with the public to address coastal impacts and violations, but it is not currently being maximized, there is an opportunity for improvement.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_X___
Medium	_____
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Wetlands have been identified by CZM staff as a high priority for this §309 program cycle. Key stakeholders also identified wetlands as a high priority (the second-highest priority) for the CZM program to address through §309 funding. Territorial wetlands provide key ecological, economic, and sociocultural (e.g., seasonal crab hunting) benefits to the USVI. Wetlands are changing, both due to development pressures and as a result of recent storms, and these changes are affecting the ability of territorial wetlands to continue to provide benefits to the community. Territorial wetlands are also threatened by cumulative and secondary stressors such as upland erosion, sedimentation, and land-based sources of pollution. Efforts to prevent, reduce, or mitigate these stressors have the potential to benefit wetlands as well as other enhancement areas, thereby maximizing the impact of such efforts.

Coastal Hazards

Section 309 Enhancement Objective: Prevent or significantly reduce threats to life and property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level change. §309(a)(2)

Note: For purposes of the Hazards Assessment, coastal hazards include the following traditional hazards and those identified in the CZMA: flooding; coastal storms (including associated storm surge); geological hazards (e.g., tsunamis, earthquakes); shoreline erosion (including bluff and dune erosion); sea level rise; Great Lake level change; land subsidence; and saltwater intrusion.

Phase I (High-Level) Assessment:

Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, indicate the general level of risk in the coastal zone for each of the coastal hazards. The following resources may help assess the level of risk for each hazard. Your state may also have other state-specific resources and tools to consult. Additional information and links to these resources can be found in the "Resources" section at the end of the Coastal Hazards Phase I Assessment Template:

    - The state's multi-hazard mitigation plan.
    - Coastal County Snapshots: Flood Exposure
    - Coastal Flood Exposure Mapper
    - Sea Level Rise Viewer/Great Lakes Lake Level Change Viewer
    - National Climate Assessment

General Level of Hazard Risk in the Coastal Zone

Type of Hazard	General Level of Risk[6] (H, M, L)
Flooding (riverine, stormwater) [7,8]	H
Coastal storms (including storm surge) [7,8, 9, 10]	M/H
Geological hazards (e.g., tsunamis, earthquakes) [7] *[It should be noted that risk from earthquakes is variable across the islands, and within islands, due to differences in geology.]*	M

[6] Risk is defined as "the estimated impact that a hazard would have on people, services, facilities and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage." *Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001*

[7] 2019 Territorial Hazard Mitigation Plan (USVI Office of Disaster Recovery, 2019). https://www.usviodr.com/2019-territorial-hazard-mitigation-plan/

[8] 4th National Climate Assessment, Caribbean Chapter (2018) (Gould, et al., 2018). https://nca2018.globalchange.gov/chapter/20/

[9] 2020 NFWF USVI Coastal Resilience Assessment (Dobson, Johnson, Rhodes, Lussier, & Byler, 2020)

[10] Dr. Greg Guannel, pers. comm. June 23, 2022

Shoreline erosion [7]	H
Sea level rise [7, 11]	H
Great Lakes level change	N/A
Land subsidence	L
Saltwater intrusion *[in the 2019 Territorial Hazard Mitigation Plan saltwater intrusion is considered a storm surge-related impact, rather than as a separate impact with an associated risk]*	L
Other (please specify)	

It is important to note that while the general territorial community risk levels to flooding (riverine, stormwater), coastal storms (including storm surge), and sea level rise are categorized as high or medium/high, the areas at highest risk to these threats are concentrated in several areas of high population density[8]. These high-risk areas are more densely populated and contain critical infrastructure and facilities, such as power generation facilities and ports as well as important community assets including schools and public service facilities. The remainder of the territory's coastline is less threatened by flooding due to the topography of the islands and a lesser incidence of impermeable surfaces. Inland areas are at increased risk from flooding associated with heavy rain events and flash flooding of ghuts. Generally, for coastal storms impacting the territory, there are lesser impacts associated with category 1-3 storms, and the potential for greater impacts with the stronger category 4-5 storms[10]. Compound flooding, where riverine and stormwater flood events exacerbate storm surge flooding occurring at the coast, is an additional threat particularly in densely populated, high-risk areas of the territory.

The risk associated with geological hazards has been characterized as medium because while there is the potential for significant consequences from these events, their probability generally is low[10], although the probability is higher than previously understood for the St. Thomas/St. John district. Due to the narrow nature of the shelves surrounding the islands, tsunamis are limited in their ability to build. Any threat from tsunamis is higher in the urban coastal areas for the reasons described above with respect to flooding. The threat from earthquakes for St. Croix is low, but in St. Thomas and St. John there is an increased risk due to higher ground acceleration[10] if the earthquake were to originate within the USVI.

2. If available, briefly list and summarize the results of any additional data or reports on the level of risk and vulnerability to coastal hazards within your state since the last assessment. The state's multi-hazard mitigation plan or climate change risk assessment or plan may be a good resource to help respond to this question.

The impacts of Hurricanes Irma and Maria in 2017 were devastating for the USVI, and caused significant damage to housing, infrastructure, and the economy. The USVI Disaster Recovery Action Plan (2019) estimates the damage from the dual hurricanes at $11.25 billion. The storms are estimated to have brought winds exceeding 170 miles per hour and more than 20 inches of rain to the territory. The storm surge associated with Irma and Maria is estimated to have been at least 2.3 ft. and 2.8 ft.,

[11] NOAA Sea Level Rise Viewer. See https://coast.noaa.gov/slr/#

respectively, although in-territory instrumentation went offline during the storms (USVI Hurricane Recovery and Resilience Task Force, 2018). Roadways were washed out and buried in debris, mud, and downed powerlines. According to the USVI Office of the Governor, Office of Disaster Recovery (2019) the storms created more than 825,316 cubic yards of debris, and over 85% of households reported damage to their homes, with many structures deemed uninhabitable. Many government offices and primary healthcare facilities were damaged and rendered unusable. Airports and seaports were closed for weeks due to extensive damage and more than 400 vessels sank, which made navigating coastal waters dangerous. The physical damage from the storms brought tourism, the territory's main economic driver, to a standstill.

As part of the process to develop a Hazard Mitigation and Resilience Plan (HMRP) for the Virgin Islands (https://resilientvi.org/) hazard evaluations have been completed for riverine flooding, and tsunamis.

Riverine flooding is a serious threat to the territory. Data produced during the development of the HMRP show that land cover changes are a major driver of the increase in runoff rates and associated damaging and dangerous flooding. Development has changed how rainwater moves across the landscape dramatically increasing runoff rates (Figure 1).

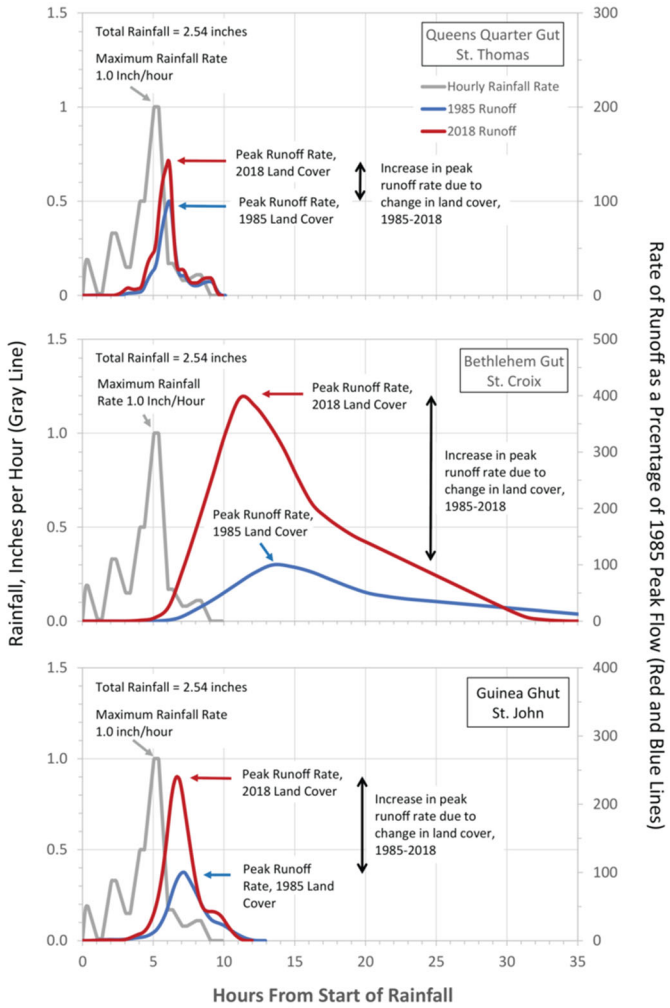


Figure 1: Rainfall runoff vs. land cover Results of a computer model simulation of a moderately heavy rain event that dropped 2.54 inches of rain (rate of 1 inch per hour) at Cyril E. King Airport in 2018. A rain event of this type is not exceptional for USVI storms and an event like this could be expected to occur once per year. Runoff rates for three ghuts are shown under two different land cover scenarios, 1985 and 2018. Land cover is the only variable that was changed between the runoff simulations for 1985 and 2018. Results show that runoff in 2018 is 143%, 397%, and 240% of what occurred in 1985, suggesting that development-driven land cover changes since 1985 are responsible for a large portion of the stormwater experienced that day. Source: www.resilientvi.org/riverine-flooding-usvi

Stormwater management interventions such as drainage channels and culverts have been implemented throughout the territory, however these infrastructure solutions do not always work as designed, have not been effectively maintained, and have not been scaled up over time to account for the increase in impervious surfaces and altered water courseways as development density and sprawl have increased. Reports of flooding occur regularly even from routine storm events (Table 1). A 100-year rainfall event would drop 13.4 inches of rain in 24 hours, or over three inches per hour.

Probability Of Flooding		
1-Day Rainfall	St. Thomas	St. Croix
4" or more	92%	75%
2.5" – 4"	48%	53%
2" – 2.5"	25%	35%

Table 1: Average probability of flooding, 1998-2019. Table is based on the Storm Events Database and historical hourly rainfall data provided by the Local Climatological Data Tool both maintained by NOAA. Quality-controlled, historical rainfall data are not readily available for St. John. Source: www.resilientvi.org/riverine-flooding-usvi

The risk from *tsunamis* in the territory is small but the potential for significant consequences is real. There are potential tsunami sources near the territory, which means that warning times prior to a tsunami impact could be short. Less time to prepare, combined with highly populated urban coastal centers and tourism focused on the coast mean that tsunamis are a risk that must be planned for. There are also concerns regarding the confounding impact of sea level rise on tsunami inundation. While this data is not currently available, a projected sea level rise of 50cm by 2050 could significantly change the impact of a tsunami on the USVI (www.resilientvi.org/tsunami-1).

Data on other coastal hazards including hurricanes, earthquakes, coastal flooding, and climate change as part of the HMRP are still being evaluated.

According to data collected for the Coastal Vulnerability Index (CVI), shoreline erosion is a concern for the USVI. Beach erosion data indicates that all beaches in the territory are eroding, particularly in exposed areas. Sea level rise will mostly impact beaches, with estimates that 83% of the shoreline is and will continue to become wetter[12]. Impacts from shoreline erosion and sea level rise have implications for tourism, recreation, and public access. Adaptation and management of coastal areas needs to be prioritized to mitigate these impacts. Also concerning are the compounding effects of sea level rise, rain events, and storm impacts (e.g., storm surge) and how they will undermine structures or critical infrastructure such as roads in hazard events.

[12] Dr. Greg Guannel, pers. comm. June 23, 2022

Management Characterization:

1. In the tables below, indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred that could impact the CMP's ability to prevent or significantly reduce coastal hazards risk since the last assessment.

Significant Changes in Hazards Statutes, Regulations, Policies, or Case Law

Topic Addressed	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Elimination of development/redevelopment in high-hazard areas[13]	N	N/A	N
Management of development/redevelopment in other hazard areas	Y	N/A	N
climate change impacts, including sea level rise	Y	N/A	N

Significant Changes in Hazards Planning Programs or Initiatives

Topic Addressed	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Hazard mitigation	Y	N/A	Y
Climate change impacts, including sea level rise	Y	N/A	Y

Significant Changes in Hazards Mapping or Modeling Programs or Initiatives

Topic Addressed	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Sea level rise	Y	N/A	Y
Other hazards	Y	N/A	Y

2. Briefly state how "high-hazard areas" are defined in your coastal zone.

DPNR's Division of Building Permits Floodplain Management in the USVI Quick Guide (2020)[14] defines the Coastal High Hazard Area (Zone V) as the special flood hazard area that extends from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action. USVI Coastal High-Hazard areas are identified using a combination of

[13] Use state's definition of high-hazard areas.
[14] See https://dpnr.vi.gov/wp-content/uploads/2020/09/Quick-Reference-Quick-Interactive_FNL-1.pdf

federal data and the local knowledge of coastal zone professionals. The Federal Emergency Management Agency (FEMA) classifies areas into zones according to the level of perceived flood hazard. In the USVI, Zone V, VE (1% annual chance floodplain where wave heights are expected to be three feet or more), and V1-V30 are part of the Special Flood Hazard Area (SFHA). The Coastal A Zone (CAZ) refers to a portion of the SFHA landward of a Zone V or landward of an open coast without Zone V. CAZs may be subject to breaking waves between 3 and 1.5 feet high (Division of Building Permits, 2020). Zone A is the most landward portion of the SFHA and is subject to flooding by the base or 1% annual chance flood with waves less than 3 feet high (see Figure 2, below). The spatially explicit form of this data is the 2007 Flood Insurance Risk Map (FIRM), which is used along with more current advisory maps and best available maps (most recently updated in 2018) that are updated when storms impact the USVI to make development decisions[15]. Areas subject to CAZ conditions may not be shown on FIRMs. As of 2020, FEMA has not delineated a limit of moderate wave action on FIRMs for the USVI (Division of Building Permits, 2020).

There are currently no Hazard Designated Areas that are treated uniquely in the permitting process; however, the designation is proposed.

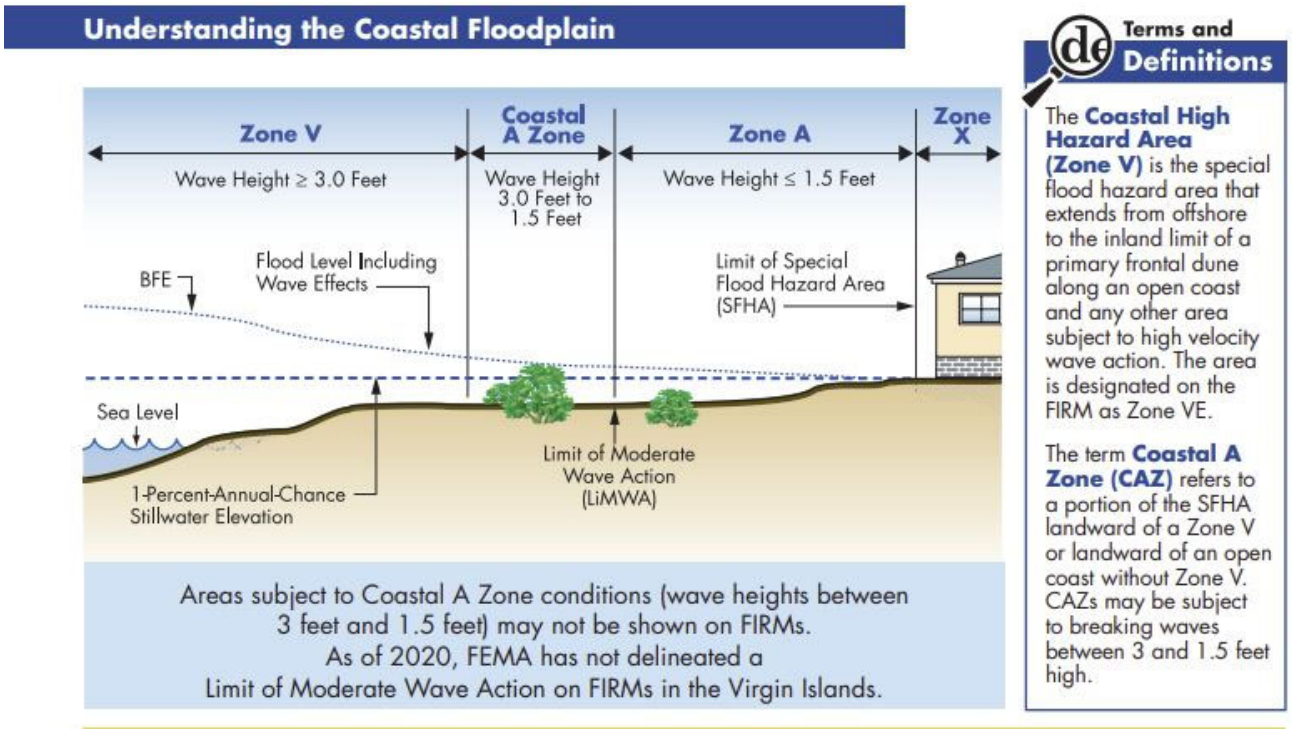


Figure 2: How the coastal high hazard area and coastal floodplain are defined for the USVI.
Source: https://dpnr.vi.gov/wp-content/uploads/2020/09/Quick-Reference-Quick-Interactive_FNL-1.pdf

[15] Director Jackson-Acosta, DPNR Division of Building Permits, pers. comm. August 2, 2022.

3. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Statutes, Regulations, Policies, or Case Law

DPNR amended the **Territorial flood regulations** in 2021[16], which will improve coastal infrastructure resilience and preparedness.

Other changes to CZM policies and procedures since the last A&S include finalizing **revisions to the EAR requirements** and **developing standardized EAR evaluation procedures** to incorporate climate change impacts and improve record-keeping (Division of Coastal Zone Management, 2020). The CZM Coastal Resilience Coordinator has developed a **coastal resilience evaluation component** to be included in major land and major water permits submitted to CZM. This coastal resilience evaluation component will require the applicant to consider coastal flooding and runoff implications associated with the project.

A future potentially significant change for addressing impacts from coastal hazards, and for the CZM program, is the **Comprehensive Land and Water Use Plan (CLWUP)** which is in the earliest stages of development. CZM has executed a contract to develop the plan, and it is likely that the CLWUP development process will be concurrent with the FY 2023-2025 §309 cycle. A CLWUP will provide for watershed-scale spatial management of resources and has long been identified as a critical need for the USVI to manage coastal resources more effectively. There will be opportunities for cross-pollination between the CLWUP and §309 efforts, which will benefit both as well as improve outcomes for the USVI community and coastal resources.

Planning Programs or Initiatives

In 2015 **Executive Order No. 474-2015**[17] was issued which directed all USVI government departments and programs to assess their risk and vulnerability to climate change, to develop and implement agency adaptation plans to address the identified risk, and to integrate climate change adaptation into project and programmatic designs. The climate change assessment was completed for DPNR-CZM (2020) and produced several findings which have been incorporated into the program and projects. The executive order also created a VI Climate Change Council and a Technical Advisory Group to support the creation of a Territorial Climate Change Program; neither of these bodies are currently active. While the executive order had the potential to create significant change within the wider government to address vulnerability to climate change, there have been few substantive efforts or actionable outputs as a result of it.

[16] See https://dpnr.vi.gov/wp-content/uploads/2021/11/Amended-VI-flood-Rules-and-Regulations.pdf
[17] See https://climatechangevi.org/wp-content/uploads/2016/09/ExecOrder_474-2015_USVI_Adapting_to_the_Impacts_of_Climate_Change.pdf

In 2019, CZM secured funds through the FEMA Hazard Mitigation Grant Program to commission **watershed management plans**[18] for three high priority watersheds in St. Thomas and five high priority watersheds in St. Croix. The St. Thomas watersheds are the areas associated with the Cyril E. King Airport, St. Thomas Harbor, and Bolongo Bay. In St. Croix, the target watersheds are Long Point Bay, Diamond, Bethlehem, Salt River Bay, and Hovensa. These watersheds include areas with critical infrastructure, commercial, government and residential investments, and agricultural activity and have been impacted by land cover changes and flooding. These plans, completed in June 2022 will inform actions to improve water management, reduce flooding and runoff, and increase Territorial resiliency to other associated coastal hazards and climate change impacts.

The **Hazard Mitigation and Resilience Plan for the Virgin Islands (HMRP, www.resilientvi.org)** is being developed. The HMRP is the most current iteration of FEMA's State Mitigation Plans which are required to be updated and submitted for approval every five years. The University of the Virgin Islands (UVI) is leading the multi-year planning effort in conjunction with the VI Territorial Emergency Management Agency to create the plan. The goal of the HMRP process is to not only meet the FEMA requirements but to provide a consistent territorial approach to assessing hazards and risks. The HRMP process is participatory and is engaging stakeholders and the public to address vulnerabilities by defining approaches that enhance the capabilities of individuals, communities, government, institutions, and businesses to withstand, survive, adapt, and recover from disruptions.

Mapping or Modeling Programs or Initiatives

The **Coastal Vulnerability Index (CVI)** is a collaborative project between CZM and UVI to characterize beach and rock shoreline changes and provide recommendations for mitigation and adaptation (Guannel, et al., 2022a). The CVI will provide data to support the development of policies and practices to increase resiliency to coastal hazards such as shoreline loss and increased risk of storm damage by informing the evaluation of the minimum setback distance, hazardous coastal zones, and stormwater retention capacity. Data from the CVI will also be used to help identify high-risk zones to be considered for no- or low-development plans.

A recent collaboration between CZM and UVI to **characterize and map socially vulnerable populations**[19] in the USVI has provided data that can inform disaster preparedness and mitigation strategies, disaster response efforts, and planning policies (Guannel, et al., 2022b). Project reports indicate that a majority of people living in territorial flood zones are socially vulnerable. This information can be used to prioritize disaster planning such as the location and identification of shelters or to provide education and outreach on specific hazards, as well as response efforts such as assessments of public service losses and more targeted distribution of resources. Results can also be used to improve regulations to prevent adverse health effects associated with land use practices and to develop improved policies to increase community resilience and decrease vulnerability.

The **USVI Coastal Resilience Assessment** (Dobson, et al., 2020) was developed by the National Fish and Wildlife Foundation in 2020 to support effective, data-driven decision making to improve community

[18] See https://watershedvt.maps.arcgis.com/apps/MapSeries/index.html?appid=bc4e3799113d476ea23795fe4e2239b1
[19] See https://cgtc-usvi.org/usvi-social-vulnerability-index

resilience to flood-related threats. There is a USVI Coastal Resilience Assessment report, and a GIS-based web tool, the Coastal Resilience Evaluation and Siting Tool. The assessment identified areas in the USVI that are not only exposed to a range of coastal flood threats, but also contain higher concentrations of community assets. The assessment also analyzed the distribution of terrestrial and nearshore marine areas with significant fish and wildlife resources. By combining spatial data on land use, protected areas, human community assets, flooding threats, and fish and wildlife resources the assessment has identified natural areas suitable for the implementation of resilience projects that have the potential to support both the people and wildlife of the USVI. This information helps to identify resilience hubs which can be used for management and restoration planning purposes.

The **U.S. Army Corps of Engineers South Atlantic Coastal Study (SACS)**[20] is a comprehensive study that applies watershed planning concepts to identify actions for advancing coastal resilience. The SACS seeks to provide a common understanding of risk from coastal storms and sea level rise to support resilient communities and habitats and to leverage actions to plan and implement risk management strategies. The final draft of the USVI Appendix to the SACS was released for public comment in October of 2021. The Tier 1 SACS risk assessment for the USVI identified nine locations as high risk to inundation under existing or future conditions. The Tier 2 risk assessment provides additional details on levels of economic, cultural, and environmental risk. The SACS for the USVI also includes specific and detailed recommendations to address coastal storm risk (U.S. Army Corps of Engineers, 2022).

The **U.S. Virgin Islands – Advisory Flood Hazard Resources Map**[21] created by FEMA in 2018 after the impacts from Hurricanes Irma and Maria, was updated in 2022. The map includes Advisory Base Flood Elevations and storm erosion areas for the USVI. This data can serve as a guide to understanding current flood and erosion hazard conditions to reduce risk to and impacts from similar hazard events in the future.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	__X__
Medium	_____
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

   Coastal Hazards have been identified by CZM staff as a high priority for this §309 program cycle. Key stakeholders also identified coastal hazards as one of the top three high priority enhancement areas for the CZM program to address through §309 funding. As has been noted, the 2017 hurricane season dramatically highlighted how vulnerable the USVI are to coastal hazards,

[20] See https://www.sad.usace.army.mil/SACS/
[21] See https://www.arcgis.com/home/item.html?id=a92ce1763cb5416dafa01b84757a5af9

particularly to hurricanes, significant rain events, flooding, and erosion. Future risk to people, structures, and coastal resources is expected to increase as a result of climate change and continued development pressures. Addressing coastal hazard impacts has the potential to also reduce negative impacts to other enhancement areas including wetlands, ocean resources, and public access and to mitigate cumulative and secondary impacts.

Public Access

Section 309 Enhancement Objective: Attain increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value. §309(a)(3)

Phase I (High-Level) Assessment:

Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Use the table below to provide data on public access availability within the coastal zone.

The USVI Open Shorelines Act, Title 12, Sections 401-403 mandates that the public individually and collectively have the right to use and enjoy any shoreline.

Public Access Status and Trends

Type of Access	Current number[22]	Changes or Trends Since Last Assessment[23] (↑, ↓, –, unkwn)	Cite data source
Beach access sites	STX – 59 STJ – 41 STT – 46 (54 incl. offshore cays)	Increase (May be data collection or documentation artifact)	CZM ArcGIS Parks, Beaches, and Public Access
Shoreline (other than beach) access sites	Unknown	Unknown	Not tracked
Recreational boat (power or nonmotorized) access sites	STX – 4 STJ – 2 STT - 3	Decrease in STX Same in STJ Increase in STT	CZM ArcGIS Parks, Beaches, and Public Access
Number of designated scenic vistas or overlook points	STJ – 2 STT - 13	Unknown	CZM ArcGIS Parks, Beaches, and Public Access
Number of fishing access points (i.e., piers, jetties)	Unknown (Many are undocumented, there are at least 3 on STX and 2 on STT)	Unknown	agency communication
Number of shoreline fishing access points	STX – 15 STT – 15	Unknown	https://dpnr.vi.gov/fish-and-wildlife/fish/

[22] Be as specific as possible. For example, if you have data on many access sites but know it is not an exhaustive list, note "more than" before the number. If information is unknown, note that and use the narrative section below to provide a brief qualitative description based on the best information available.
[23] If you know specific numbers, please provide. However, if specific numbers are unknown but you know that the general trend was increasing or decreasing or relatively stable or unchanged since the last assessment, note that with a ↑ (increased), ↓ (decreased), – (unchanged). If the trend is completely unknown, simply put "unkwn."

Coastal trails/ boardwalks *(Please indicate number of trails/boardwalks and mileage)*	STX – 2 STT – 2 STJ - 8	Unknown	CZM ArcGIS Parks, Beaches, and Public Access, agency communication, VI National Park website
Number of acres parkland/open space Note: several of these parks include submerged lands	More than: VI National Park (14,826-ac) VI Coral Reef NM (12,708-ac) Buck Island Reef NM (4,554-ac) Christiansted NHS (6,708-ac) Salt River Bay NHP (1.015-ac) St. Croix East End Marine Park (38,301-ac) St. Thomas East End Reserves (2,372-ac) Cramer's Park	Unknown	
Access sites that are Americans with Disabilities Act (ADA) compliant[24]	Unknown	Unknown	
Other (please specify)			

2. Briefly characterize the demand for coastal public access and the process for periodically assessing demand. Include a statement on the projected population increase for your coastal counties. There are several additional sources of statewide information that may help inform this response, such as the Statewide Comprehensive Outdoor Recreation Plan,[25] the National Survey on Fishing, Hunting, and Wildlife Associated Recreation,[26] and your state's tourism office.

[24] For more information on ADA see *www.ada.gov*.

[25] Most states routinely develop "Statewide Comprehensive Outdoor Recreation Plans," or SCROPs, that include an assessment of demand for public recreational opportunities. Although not focused on coastal public access, SCORPs could be useful to get some sense of public outdoor recreation preferences and demand. Download state SCROPs at *www.recpro.org/scorp-library*.

[26] The National Survey on Fishing, Hunting, and Wildlife Associated Recreation produces state-specific reports on fishing, hunting, and wildlife associated recreational use for each state. While not focused on coastal areas, the reports do include information on saltwater and Great Lakes fishing, and some coastal wildlife viewing that may be informative and compares 2016 data to 2011, 2006 and 2001 information to understand how usage has changed. See www.wsfrprograms.fws.gov/subpages/nationalsurvey/national_survey.htm

The beaches and coastline of the USVI are important as they support the sociocultural and economic foundation of the territory. There is a long tradition of residents using the shorelines for their livelihoods, recreation, and to support cultural traditions (e.g., multi-generational shoreline camping). Territorial beaches and shorelines are also important to visitors, with the clear waters and white sand beaches supporting the USVI's tourism industry. Due to the mild year-round climate, USVI beaches are always in demand. However, there is currently no regular process to assess and/or document public demand for beach and shoreline access.

According to U.S. Census data (2020), the population of the USVI has declined by 18% from 106,405 people in 2010 to 87,146 in 2020. A decrease was expected, as the population had been declining prior to the 2010 census (a 2% decline between 2000 and 2010), followed by the closure of the Hovensa oil refinery on St. Croix in 2012, and then the devastating impacts of the 2017 hurricane season, which also contributed to the number of people leaving the territory. Data and models from the U.N. Department of Economic and Social Affairs, Population Division predict that the USVI population will continue to decline[27,28]. Similarly, total visitors to the territory have also declined over the past five years, in part due to the damage from Hurricanes Irma and Maria in 2017 and also partly due to the Covid-19 pandemic and associated travel restrictions. Visitor arrivals in 2021 totaled 1,047,816, which is less than half of the number that visited the territory in 2017 before the hurricanes[29]. It is expected that tourism will recover as the territory rebuilds and pandemic restrictions decline.

The use of territorial shorelines and beaches by the USVI public is protected by law as described in the Open Shorelines Act. However, there are no specific provisions in the Open Shorelines Act for the right to access those shorelines, there are no specified consequences or penalties for prohibiting the public's use of and access to the shorelines, nor is there a designated authority to investigate and enforce violations of the law (Felix, 2015). There has been periodic but significant conflict surrounding the public's use and access to territorial beaches and shorelines. Instances of land and property owners restricting public access to the shore have occurred and have the potential to increase, particularly since the 2017 hurricane season and an increased turnover in property ownership. As a result, there have been noted increases in user conflicts and the possibility exists for conflicts to increase and escalate further.

The demand for access to the shorelines is high and the potential for use conflicts is also currently high. The quality of existing public access points is highly variable. Some are well-marked and well-used. Others are inadequate because they are not maintained (vegetative overgrowth, unsafe trails), not marked, and/or amenities to support the public's safe usage (designated parking, trash receptables, rest rooms) are lacking. There are opportunities to enhance existing public access points to the shoreline and to expand the number of access points.

It should be noted that there is an additional sense of urgency to address challenges to the public accessing territorial beaches and shorelines. Climate change has the potential to negatively impact public access. Depending on the legal framework utilized to create and protect public access and to

[27] See https://population.un.org/wpp/
[28] See https://www.worldometers.info/world-population/united-states-virgin-islands-population/
[29] See http://www.usviber.org

define the public trust area (shoreline), sea level rise could significantly reduce access. Additional data on how shorelines and beaches will be impacted by sea level rise is discussed in the Coastal Hazards section.

3. If available, briefly list and summarize the results of any additional data or reports on the status or trends for coastal public access since the last assessment.

The USVI does not have a Comprehensive Outdoor recreation plan or other reports that document coastal public access trends. Feedback received from CZM key stakeholders as part of the §309 Assessment process indicates that amenities at existing public access sites are inadequate. Stakeholders indicated that trash receptacles, rest rooms, and trails or boardwalks are the amenities that would most improve public access to USVI coastal resources.

As noted previously, conflicts between property owners who restrict or block public access to the shoreline and users of the coast appear to be increasing. Property ownership trends such as off-islanders purchasing coastal plots and the conversion of properties to short-term rentals (e.g., Airbnb, VRBO) since the 2017 hurricane season may be contributing to these conflicts.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) that could impact the future provision of public access to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.

Significant Changes in Public Access Management

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	N/A	N
Operation/maintenance of existing facilities	Y	N/A	N
Acquisition/enhancement programs	Y	N/A	N

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

There are some initiatives and efforts in process that have the potential to significantly change the way public access is managed in the future.

Statutes, regulations, policies, or case law

While not enacted, there have been two bills introduced in the Legislature that have the potential to significantly impact public access in the future by amending specific sections of the CZMA to expand public access to Territorial beaches. Bill 33-0105 proposes modifying standards for the issuance of CZM permits and modifying requirements for permits for the development or occupancy of trust lands, submerged, or filled lands. Bill 33-0108 (and proposed amendment No. 33-439) is an effort to strengthen the territory's Open Shorelines Act by requiring that new shoreline developments (not current properties) provide an access point to the shoreline for the public, imposing fines to those failing to comply, and granting DPNR the enforcement and investigative authority for shoreline access issues. DPNR has communicated concerns to the legislature regarding legal and liability issues with the way the proposed bill has been written. Neither bill has been promulgated yet.

Another effort in process, but not implemented yet would create a division of Territorial Parks and Protected Areas within DPNR, moving the responsibility of several properties currently managed by VI Department of Sports, Parks, and Recreation (DSPR) into the new management division. Legislation establishing the new division would also make public beaches the jurisdiction of DPNR. The Youth, Sports, Parks, and Recreation Committee unanimously voted in favor of the bill in 2022.

Operation/maintenance of existing facilities

DPNR provided funding to the DPSR to install buoys at the Cramer's Park swim area. The DSPR has also implemented other management activities in support of public use of coastal resources including progressively demarcating swim areas at multiple beaches in 2021, partnering with Friends of the Park to implement a learn to swim program at Oppenheimer Beach on St. John, requesting and obtaining approval for a Marine Sports Coordinator position, and is spearheading a Territorial Wellness Program initiative that would incorporate parks, recreation areas and beaches. Additionally, in FY2021 the DSPR applied for, and received a Technical Assistance Program grant through the U.S. Department of the Interior's Office of Insular Affairs. These grant funds will support the development of an application to develop a Territorial Comprehensive Outdoor Recreation Plan, which would be the first such plan for the USVI.

The USVI DPNR Hotline App is a tool that can be used to report blocked public access points and impacts to natural resources. More info on the app is provided in the Wetlands section of this document.

3. Indicate if your state or territory has a publicly available public access guide. How current is the publication and how frequently it is updated?[30]

Publicly Available Access Guide

Public Access Guide	Printed	Online	Mobile App
State or territory has? (Y or N)	Past publications: Public Access brochure (2016), VI Shoreline Guide (1999), Beach Access Guide (2010), Scenic Resources Guide (2004)	N	N
Web address (if applicable)	Partial *https://dpnr.vi.gov/czm/programs-viczmp/public-access-viczmp/*	Partial *https://dpnr.vi.gov/czm/programs-viczmp/public-access-viczmp/*	N
Date of last update	Unknown	N/A	N/A
Frequency of update	Unknown	N/A	N/A

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High _X___
Medium _____
Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

While public access did not rank particularly high in stakeholder feedback CZM considers this to be a high priority enhancement area to be further developed through a Phase II Assessment. There are significant concerns regarding opportunities to secure public access for the future (or in perpetuity) that may be lost if the inadequacies of the current legislation are not rectified. There are also concerns regarding increasing use conflicts, particularly in St. Croix where there is a long history of cultural shoreline camping.

[30] Note some states may have regional or local guides in addition to state public access guides. Unless you want to list all local guides as well, there is no need to list additional guides beyond the state access guide. You may choose to note that the local guides do exist and may provide additional information that expands upon the state guides.

Marine Debris

Section 309 Enhancement Objective: Reducing marine debris entering the nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris. §309(a)(4)

Phase I (High-Level) Assessment:
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, characterize the existing status and trends of marine debris in the state's coastal zone based on the best-available data.

According to CZM staff the status and trends of marine debris in the USVI can be characterized as follows:

Existing Status and Trends of Marine Debris in Coastal Zone

Source of Marine Debris	**Significance of Source** (H, M, L, unknwn)	**Type of Impact**[31] (aesthetic, resource damage, user conflicts, other)	**Change Since Last Assessment** (↑, ↓, –, unkwn)
Beach/shore litter	H	Aesthetic, resource damage	unkwn
Land-based dumping	H	Aesthetic, resource damage	unkwn
Storm drains and runoff	M	Aesthetic, resource damage	-
Land-based fishing (e.g., fishing line, gear)	M	Resource damage	unkwn
Ocean-based fishing (e.g., derelict fishing gear)	L	Resource damage	unkwn
Derelict vessels	M	Aesthetic, resource damage	-
Vessel-based (e.g., cruise ship, cargo ship, general vessel)	L	Aesthetic, resource damage	-
Hurricane/Storm	M	Aesthetic, resource damage	-
Tsunami	L	Aesthetic, resource damage	-
Other - Vessel Groundings	M	Resource damage	-

[31] You can select more than one, if applicable.

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends or potential impacts from marine debris in the coastal zone since the last assessment.

According to VI EPSCoR, approximately 90% of marine debris in the USVI comes from land-based sources. Summarized territory-specific data provided by VI EPSCoR is provided below[32]:

- VI Coastweeks is the longest ongoing, data-collecting, series of cleanups in the territory. Collectively the Coastweeks cleanups have removed more than 275,000 pounds of debris from USVI shorelines.
- NOAA's Marine Debris Program (MDP) has provided more than $4.84M in grants to USVI organizations for marine debris removal, education, and prevention. To date more than 377,500 pounds of debris has been removed from territorial shores as part of these efforts.
- The most abundant marine debris items collected are beverage bottles (glass and plastic), bottle caps (metal or plastic), and food wrappers.
- A comparison of marine debris items collected during the Great Mangrove Cleanup (described below) and items collected through territory-wide beach cleanups shows that many of the top 10 items (e.g., plastic pieces, glass beverage bottles, plastic beverage bottles, beverage cans) were the same at mangrove and beach cleanup sites. However, the density of marine debris is much greater along mangrove shorelines compared to beaches.
- To date the Great Mangrove Cleanup efforts have removed more than 56.4 tons of marine debris from mangrove shorelines on all three islands.
- More than 400 vessels sank in territorial waters in 2017 as a result of Hurricanes Irma and Maria (USVI Hurricane Recovery and Resilience Task Force, 2018).

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) for how marine debris is managed in the coastal zone.

Significant Changes in Marine Debris Management

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Marine debris statutes, regulations, policies, or case law interpreting these	Y	N/A	Y
Marine debris removal programs	Y	N/A	Y

[32] See https://viepscor.org/about-marine-debris-in-the-usvi

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes and likely future outcomes of the changes.

After the devastating 2017 hurricane season numerous initiatives were established and activities implemented to address the tremendous amount of debris throughout the Territory. In most cases these efforts are ongoing and expanding.

Hurricanes Irma and Maria (2017) left significant amounts of hurricane-generated debris, including hundreds of destroyed vessels, in their wake. A **FEMA ESF-10 Mission Assignment** included more than 100 responders from multiple local and federal agencies. The ESP-10 Mission Assignment was tasked to recover and remove pollution threats and physically remove compromised vessels. As part of this effort 354 vessels were removed from USVI shorelines. The owner, insurance company, or other party removed an additional 107 vessels. Eighteen vessels were left in place because they did not meet the criteria to be removed under ESF-10 funding. Unfortunately, Hurricane Dorian in 2019 impacted the USVI and created more damaged, abandoned, and derelict vessels that require removal. Volunteers were mobilized to address debris removal from beaches and shorelines, and **NOAA's MDP provided $4.2M in grant funds** to DPNR in support of these efforts.

A project to update USVI-specific marine debris educational materials, funded by a NOAA MDP Prevention grant, was initiated in 2016. The 2017 hurricane season, and the devastating effects of Hurricanes Irma and Maria impacted the Territory in the middle of the project. The resulting product, **Keeping Our Coastlines Clean a U.S. Virgin Islands Marine Debris Curriculum** (2018), developed in collaboration with local educators, includes 11 USVI-specific, place-based lessons and 15 spotlights, which highlight USVI-specific marine debris research, local researchers, community-led efforts, and actual natural disaster impacts that the Territory experienced from Hurricanes Irma and Maria.

The **Great Mangrove Cleanup** was held on St. Thomas in 2018. It was the first large-scale community cleanup to occur in STEER. Approximately 126 volunteers removed more than 3,000 pounds of debris from the largest remaining mangrove forest on St. Thomas. Most debris collected was land-based (90-95% of items) and 65-70% of what was collected was plastic. The most common item collected was plastic beverage bottles – 1,765 of them. The Great Mangrove Cleanup was supported by a wide range of collaborators including NOAA's MDP and Coral Reef Conservation Program (CRCP), VI-EPSCoR, the VI Marine Advisory Service, UVI's Center for Marine and Environmental Studies, CZM, USVI Marine Rebuild Fund, and three local businesses, VI Ecotours, Pizza Pi, and Custom Builders. The Cleanup has since expanded to all three islands, with the 5th annual cleanups occurring in April of 2022. To date more than 400 volunteers have participated, aged 4-77 and more than 56.4 tons of marine debris from mangrove shorelines has been removed.

The **USVI Marine Rebuild Fund** was created by the Community Foundation of the Virgin Islands and consists of public donations received through GoFundMe efforts established to help the USVI recover

from the aftermath of Hurricanes Irma and Maria. The Fund is managed by a committee of representatives from the private and public sectors and DPNR CZM. The fund has been used not only to facilitate cleanup efforts following the 2017 hurricane season, but to reestablish marine vocational initiatives to support displaced skilled and unskilled workers from the hospitality and marine industries whose workplaces were destroyed or severely damaged, and to train the next generation of marine industry professionals.

A **UVI Supporting Emerging Aquatic Scientists (SEAS) Island Alliance Program fellow** was hired and tasked with providing support to CZM for coordination of the territory's response to and prevention of marine debris. The fellow has since transitioned into a CZM-funded position as the CZM Marine Debris Coordinator and is focused on the implementation of the Marine Debris Action Plan (explained below) and continued efforts to address abandoned and derelict vessels, hurricane debris, and outreach. More specifically, the coordinator (1) helps to coordinate all calls, meetings, and major initiatives of the Marine Debris Action Plan Team, (2) assists with the management of all current marine debris related grants and awards within the Division, (3) coordinates coastal cleanups throughout the territory, (4) creates and manages marine debris related outreach projects, and (5) implements data management and reporting of abandoned and derelict vessels in the territory.

In 2017, the territory enacted a **plastic bag ban**. Unfortunately, implementation and enforcement of the ban was limited, in part due to loopholes and insufficiencies in the legislation, and in part due to Hurricanes Irma and Maria's impact on the USVI. In 2019, the ban was expanded to include plastic straws and efforts were made to increase the effectiveness of the legislation by improving the original language and by expanding the number of agencies able to enforce the ban. There is limited information to date on how effective these bans have been at reducing the number of single-use plastic bags and straws entering coastal habitats. While the current legislation is a good start for the territory, according to staff at CZM and UVI these bans are not as effective as they could be due to limited enforcement. If there were a champion in the legislature these bills could be enhanced and expanded to include other items that are detrimental to the health of the community and environment, such as expanded polystyrene.

The **USVI DPNR Hotline App** is a tool that can be used to report impacts to natural resources. More info on the app is provided in the Wetlands section of this document.

The **USVI Marine Debris Action Plan 2021-2026** (MDAP) (University of the Virgin Islands, 2021) is a living document created to protect the USVI's coasts, people, and wildlife from the impacts of marine debris. The MDAP provides guidance and structure to stakeholders working to address marine debris and strengthens or creates partnerships between local, regional, and national stakeholders. The MDAP was built on significant and ongoing efforts to address marine debris in the Territory. The MDAP was created through the efforts of 90 contributors, and consists of five goals, 16 objectives, and 86 strategies. Of the strategies, 23 have been initiated, eight are ongoing and four are planned. The MDAP was produced by UVI with funding from NOAA's MDP and will be updated every five years.

Originally published in 2020, the **U.S. Virgin Islands Marine Debris Emergency Response Guide**[33] was created to improve preparedness for response and recovery operations following any natural disaster or event that generates large amounts of marine debris in the USVI. The document details existing response structures at the Territorial and Federal levels and highlights organizational roles and responsibilities. The Guide was updated in 2021 (NOAA Marine Debris Program, 2021) and is accompanied by a Field Reference Guide which contains the most pertinent information required in the field and/or during emergency response operations.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	_____
Low	_X___

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

CZM acknowledges that marine debris is an important issue within the USVI. The stakeholder feedback indicates that marine debris should be a medium to low priority for the use of §309 funds during this program cycle. Considering the existing efforts underway in the territory to address marine debris, CZM is categorizing it as low priority for this §309 Assessment cycle.

[33] See https://marinedebris.noaa.gov/emergency-response-guide/us-virgin-islands-marine-debris-emergency-response-guide-0

Cumulative and Secondary Impacts

Section 309 Enhancement Objective: Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources. §309(a)(5)

Phase I (High-Level) Assessment:
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Using National Ocean Economics Program Data on population and housing,[34] please indicate the change in population and housing units in the state's coastal counties between 2012 and 2017. You may wish to add additional trend comparisons to look at longer time horizons as well (data available back to 1970), but at a minimum, please show change over the most recent five-year period data is available (2012-2017) to approximate current assessment period.

Trends in Coastal Population and Housing Units[34]

	2012	2017	Percent Change (2012-2017)
Number of people	105,557	104,901	-0.62%
Number of housing units (U.S. Census data)	55,901 (2010)	57,257 (2020)	+2.4

2. Using provided reports from NOAA's Land Cover Atlas,[35] please indicate the status and trends for various land uses in the state's coastal counties between 1996 and 2016. You may use other information and include graphs and figures, as appropriate, to help illustrate the information. Note that the data available for the islands may be for a different time frame than the time periods reflected below. In that case, please specify the time period that the data represent.

[34] *www.oceaneconomics.org/Demographics/PHresults.aspx*. Enter "Population and Housing" section and select "Data Search" (near the top of the left sidebar). From the drop-down boxes, select your state, and "all counties." Select the year (2012) and the year to compare it to (2017). Then select "coastal zone counties."
[35] *www.coast.noaa.gov/digitalcoast/tools/lca.html*. Note that the 2016 data will not be available for all states until later Summer 2019. NOAA OCM will be providing summary reports compiling each state's coastal county data. The reports will be available after all of the 2016 data is available.

Distribution of Land Cover Types in Coastal Counties[35]

Land Cover Type	Land Area Coverage in 2012 (Acres)	Gain+/Loss- Since 2007 (Acres)
Developed, Impervious Cover	10935	+280
Developed, Open Space	8520	295
Grassland	1997	-82
Scrub/Shrub	24545	+129
Barren Land	2271	-217
Open Water	10,095	-21
Agriculture	3583	-299
Forested	32,278	-113
Woody Wetland	1564	+27
Emergent Wetland	67	1

**USVI data from C-CAP is available for 2007 and 2012. The next territory-wide update will not be available until 2023.*

3. Using provided reports from NOAA's Land Cover Atlas[36], please indicate the status and trends for developed areas in the state's coastal counties between 1996 and 2016 in the two tables below. You may use other information and include graphs and figures, as appropriate, to help illustrate the information. Note that the data available for the islands may be for a different time frame than the time periods reflected below. In that case, please specify the time period the data represents.

Development Status and Trends for Coastal Counties[36]

	2007	2012	Percent Net Change
Percent land area developed	22.02%	22.69%	0.67%
Percent impervious surface area	12.43%	12.75%	0.32%

**USVI data from C-CAP is available for 2007 and 2012. The next territory-wide update will not be available until 2023.*

How Land Use Is Changing in Coastal Counties[36]

Land Cover Type	Areas Lost to Development Between 2007-2012 (Acres)
Barren Land	87
Emergent Wetland	0
Woody Wetland	3
Open Water	0

[36] *www.coast.noaa.gov/digitalcoast/tools/lca.html*. Note that the 2016 data will not be available for all states until later Summer 2019. NOAA OCM will be providing summary reports compiling each state's coastal county data. The reports will be available after all of the 2016 data is available.

Agriculture	22
Scrub/Shrub	358
Grassland	62
Forested	190

**USVI territorial data from CCAP is only available for 2007 and 2012. The next territory-wide update will not be available until 2023.*

An evaluation of land use change over time was conducted as part of the process to update the HMRP for the USVI (also described in the Coastal Hazards section). Figure 3 below characterizes the changes in land cover class from 1985 to 2018.

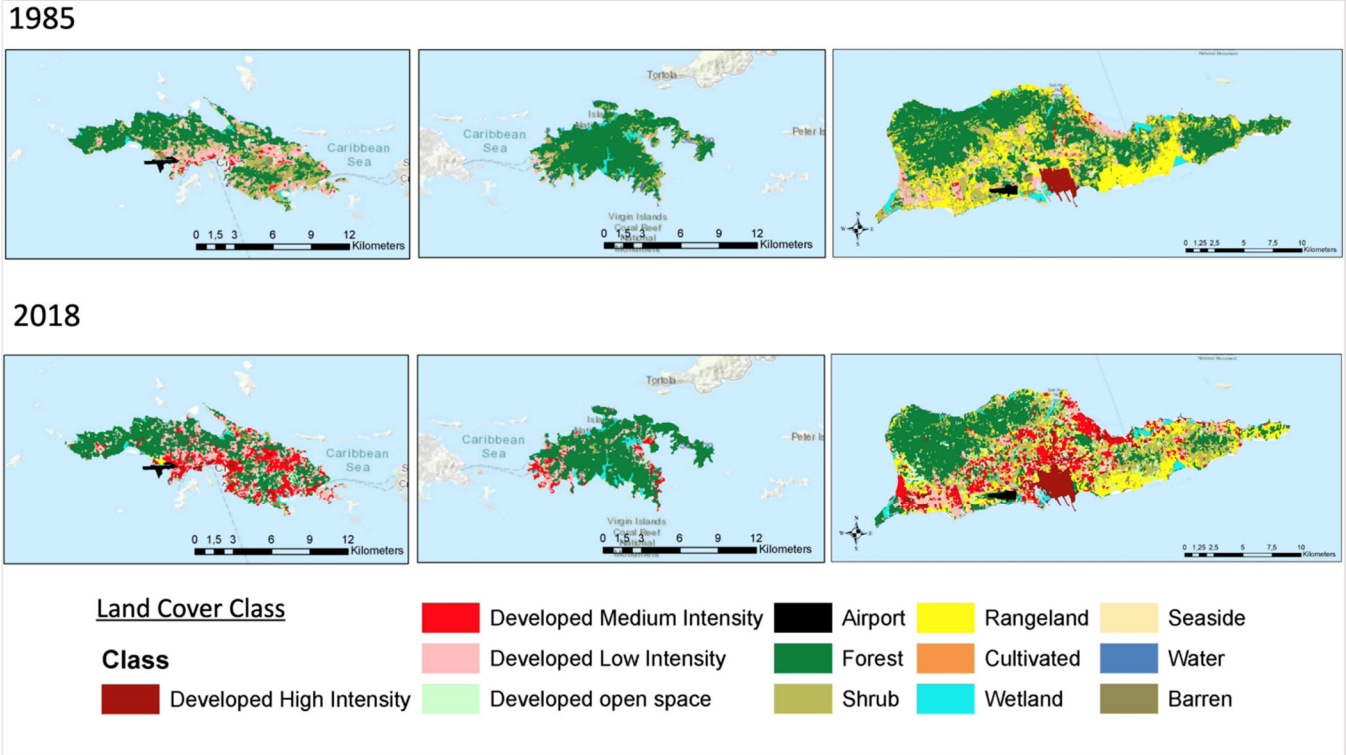


Figure 3: Land cover class change in USVI. Source: www.resilientvi.org/riverine-flooding-usvi

It is important to note that research from the northeastern Caribbean has shown that using land cover alone as a proxy for sediment delivery can be unreliable, particularly for small to medium watersheds like those in the USVI (Rogers & Ramos-Scharron, 2022). In areas such as these where there is a need to prioritize management actions and mitigation efforts to reduce erosion and sediment delivery to coastal areas watershed models that include sediment budgeting may yield better results.

4. Briefly characterize how the coastal shoreline has changed in the past five years due to development, including potential changes to shoreline structures such as groins, bulkheads and

other shoreline stabilization structures, and docks and piers. If available, include quantitative data that may be available from permitting databases or other resources about changes in shoreline structures.

Generally, there has been very little change to the coastal shoreline due to development (e.g., use of groins, bulkheads, other stabilization techniques) in the past five years[37]. The St. Thomas waterfront was expanded after it sustained damage during the 2017 hurricane season. The expansion was a multi-decadal planning effort that resulted in approximately 1km of waterfront change, primarily consisting of infilling to increase the number of highway lanes from two to four. Expanding the waterfront highway lanes was the first phase of a two-phase project; the next phase will extend the length of the highway. CZM has seen some interest in exploring the use of various shoreline stabilization techniques, as evidenced by CZM applications from businesses to repair or improve structures damaged during the 2017 hurricane season. Such applications have proposed seawalls, groins, geotubes, and beach renourishment or backfilling, but none of these have completed the permit review process.

5. Briefly summarize the results of any additional state- or territory-specific data or reports on the cumulative and secondary impacts of coastal growth and development, such as water quality, shoreline hardening, and habitat fragmentation, since the last assessment.

Data from the VI Territorial Coral Reef Monitoring Program (TCRMP)[38] has shown that land-based sources of pollution continue to be a threat to nearshore coral reef ecosystems of the USVI. Rates of silt accumulation associated with terrestrial runoff are dramatically higher on nearshore reefs compared to those at mid-shelf or offshore sites (Smith, et al., 2008). TCRMP data indicates that territorial reefs are being negatively impacted from these fine-grained terrestrial sediment inputs, which are degrading nearshore coral systems and limiting the socioeconomic benefits they provide. Nutrients carried or leached from sediments can indirectly affect corals by stimulating the growth of benthic macroalgae and causing nuisance algal blooms. Nutrients also reduce water clarity and limit light available to corals by stimulating phytoplankton growth.

Recent research has helped to identify specific types and levels of sediment-laden terrestrial runoff that are damaging to corals (Henderson, et al., resubmitting) (Tuttle & Donahue, 2022), how these flows are entering the coastal environment (Ramos-Scharron & MacDonald, 2007; Ramos-Scharron, et al., 2012; Ramos-Scharron & Figueroa-Sanchez, 2017; Rogers & Ramos-Scharron, 2022), and what types of actions can more effectively reduce erosion and sedimentation (Rogers & Ramos-Scharron, 2022). All this information provides targets to better focus regulatory and management actions. As a result of this increasing body of research, recommendations to address these impacts have been identified in the USVI Coral Reef Management Priorities (Rothenberger & Henderson, 2019), in TCRMP products (Ennis R. , et al., 2019), and others (Smith, et al., 2008; The U.S. Coral Reef Task Force, 2016; Coral Reef Conservation Program, 2018; Rogers & Ramos-Scharron, 2022).

[37] Director Hibbert, DPNR Division of Coastal Zone Management, pers. comm. December 7, 2022.
[38] USVI Territorial Coral Reef Monitoring Program Website. See https://sites.google.com/site/usvitcrmp/home

Contaminant studies have been conducted in the STEER wetlands[39]. Research has shown that the area is contaminated by heavy metals and other toxins due to runoff and leachate associated with shoreline industries and businesses, which include a landfill, scrapyard, marinas, and racetrack. Observed contaminant levels are sufficient to pose a threat to wildlife and to people who may consume seafood collected from this area. Management efforts (e.g., closing and re-siting the landfill) and proposed projects within this area such as dredging or others that may disturb sediments risk spreading contaminants. Additional information about the STEER research is included in the Wetlands section of this A&S.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state-level changes (positive or negative) in the development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources, since the last assessment.

Significant Changes in Management of Cumulative and Secondary Impacts of Development

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	N/A	N
Guidance documents	Y	N/A	Y
Management plans (including SAMPs)	Y	N/A	Y

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Guidance Documents

In 2014 the **Stormwater Management in Pacific and Caribbean Islands: A Practitioner's Guide to Implementing LID** was released (NOAA Coral Reef Conservation Program, 2014). This guide is intended for designers, engineers, agencies, and others in the islands looking for alternatives to ponding basins and detention ponds for managing stormwater. It highlights low impact development approaches to

[39] See https://static1.squarespace.com/static/57211eff59827e8a710f3c30/t/6151bdf4b7f6100ba9c6f9c0/1632747001861/%C6%92.Contamination+Infographic.pdf

improving water quality treatment, and rainwater reuse and recharge to better protect small island resources.

In 2017, as part of broader watershed planning efforts in the territory, the Coral Bay Community Council in collaboration with Watershed Consulting Associates, LLC and with funding from NOAA CRCP produced a practical manual to combatting erosion. The **Coral Bay Community Council Vegetation for Erosion Control – A Manual for Residents** (Coral Bay Community Council, 2017) provides landscaping guidance for property owners to implement erosion control projects on their own land.
The first guidance manual for **Unpaved Road Standards for Caribbean and Pacific Islands** was released in 2021 (Kitchell, et al., 2021). The manual, produced by NOAA and several partners, provides guidance on managing erosion from unpaved roads that often cause significant and chronic sedimentation that degrades wetlands and coastal waters. This manual addresses the particular concerns and challenges facing small islands and steeply sloped terrain.

The **USVI Environmental Protection Handbook** is being updated. Once finalized, the handbook could lead to significant improvements in addressing cumulative and secondary impacts of development, particularly stormwater. The Handbook provides guidance on sustainable stormwater management specific to the conditions and challenges that exist within the territory. The updated Handbook will also include new stormwater design standards for the USVI along with instructions on how to comply with the new standards, and locally appropriate design criteria and best practices. The Handbook is a tool used by agency staff evaluating development permits, by project staff, and engineers and landowners. Consultation and conformation with the Environmental Protection Handbook is often a requirement identified in special permit conditions when a CZM permit is issued. The updated Handbook is expected to be finalized by the end of 2022.

Management Plans

Several projects are in-process that will result in management plans or other tools to help to inform the management actions of CZM and its partners to address cumulative and secondary impacts of development more effectively. The **Coastal Vulnerability Index, Comprehensive Land and Water Use Plan, and Watershed Management Plans** are all discussed in more detail in the Coastal Hazards section of this A&S.

Evaluation Findings and Other Outputs with Management Implications

The USVI Coastal Management Program published Section 312 Evaluation Findings in 2018 (NOAA Office for Coastal Management, 2018). NOAA recommended that DPNR better address “monitoring and enforcement of permit conditions, especially related to sediment and erosion control measures.” The review acknowledged that the two-tier system of the USVI is ineffective and in need of change. Erosion and sedimentation control in Tier 2 needs to be improved because this sediment is easily and quickly transported to Tier 1 and coastal waters by ghuts or intermittent streams.

In 2022 the V.I. Conservation Society in partnership with CZM and Island Designs Landscape & Storm Water Solutions expanded the VI Clean Coasts Program to include assistance for homeowners. The new **Residential Erosion Control Program** will provide residential property owners with professional

site assessments and concept designs for improvements to address drainage, runoff, and erosion issues on their property.

The **Coral Watershed Assessment Tool** (National Fish and Wildlife Foundation, 2017)[40] was developed to assist watershed managers in linking watershed assessments and management planning with coral restoration and conservation. This tool provides guidance on prioritizing threats, pollution sources, and management strategies.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	__X__
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

CZM acknowledges that cumulative and secondary impacts are a primary concern for the territory, but that they are extremely difficult to effectively address. Similarly, stakeholders identified cumulative and secondary impacts as a high priority for CZM to address through the §309 program. CZM notes that there are other agencies contributing funding and efforts to implement projects resulting from the watershed planning efforts discussed in the Phase I Assessment. CZM has ranked cumulative and secondary impacts as medium priority for this §309 cycle because some of the needs and issues identified will be addressed through other territorial efforts. Additionally, strategies that are developed for enhancement areas that are ranked as high priority (e.g., coastal hazards) can address issues such as erosion, runoff, and sedimentation.

[40] See https://horsleywitten.com/pdf/170731_Coral-Watershed-Assessment-Tool_FINAL.pdf

Special Area Management Planning

Section 309 Enhancement Objective: Preparing and implementing special area management plans for important coastal areas. §309(a)(6)

The Coastal Zone Management Act defines a special area management plan (SAMP) as "a comprehensive plan providing for natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone. In addition, SAMPs provide for increased specificity in protecting natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decision making."

Phase I (High-Level) Assessment:
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, identify geographic areas in the coastal zone subject to use conflicts that may be able to be addressed through a SAMP. This can include areas that are already covered by a SAMP but where new issues or conflicts have emerged that are not addressed through the current SAMP.

Geographic Area	Opportunities for New or Updated Special Area Management Plans Major conflicts/issues
Offshore Cays	Development activity on privately-owned offshore cays. There are over 50 small cays and islands in the USVI that provide prime habitat for seabirds, lizards, turtles, and corals. All 33 territorially owned offshore cays are designated wildlife sanctuaries and a few are protected by the National Park Service and U.S. Fish and Wildlife Service. The remaining are privately-owned and are often subject to intense development pressure as well as illegal construction activity.
Coastal wetlands and streams (ghuts)	Salt ponds threatened by sedimentation, trash and debris, loss of mangrove fringe, and reduced water quality from land-based sources of pollution. Ghuts impacted from channelization, culvert restrictions, loss of riparian buffer, and encroachment from adjacent development. This was also identified as an issue in the last 312 findings.

Great Pond, St. Croix	The largest remaining salt pond in the VI, this pond is situated in the watershed to the STX East End Marine Park and contains mangrove forests that provide fish nursery and sea bird habitat. Due to sedimentation, however, the value of the habitat has declined in recent years. Protection and restoration efforts for Great Pond have been proposed, but so have hotel/casino development projects. Given the state of the St. Croix economy after closing of HOVENSA, economic desperation could increase support for large developments in the Great Pond area.
Coral Bay, St. John	Marina, hotel, and housing projects proposed for Coral Bay have met with extensive community pushback from environmental advocates. Numerous planning initiatives have been conducted through Coral Bay Community council to date, but they do not currently benefit from wide scale adoption into territorial-driven, regulatory planning processes.

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of SAMPs since the last assessment.

No SAMPs have been completed for the Virgin Islands.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) that could help prepare and implement SAMPs in the coastal zone.

Significant Changes in Special Area Management Planning

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
SAMP policies, or case law interpreting these	N	N/A	N
SAMP plans	N	N/A	N

No specifically identified SAMPs have been completed for the Virgin Islands. However, several planning initiatives are in process and are summarized below:

- The STEER Management Plan (2011) is being updated. The update process began in 2020 and is at the public and stakeholder feedback stage.
- CZM has been engaged in watershed planning efforts for many years. These efforts and the resulting 20 plans have been supported through multiple CZM program lines, coastal hazard funding, and in conjunction with partner agencies such as the Natural Resources Conservation

Service. More details on watershed planning initiatives are available on CZM's website (https://dpnr.vi.gov/resources/management-plans/).

- A future potentially significant change for addressing impacts from coastal hazards, and for the CZM program, is the **Comprehensive Land and Water Use Plan (CLWUP)** that is in early stages of development. The CLWUP is discussed in greater detail in the Coastal Hazards section of this document.

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	_____
Low	__X__

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

CZM considers Special Area Management Planning a low priority for this §309 cycle in part because several of the issues identified for SAMPs will be addressed as part of current and ongoing planning initiatives such as the CLWUP and watershed planning efforts. Additionally, strategies that are developed for enhancement areas that are ranked as high priority (e.g., coastal hazards) will result in positive outcomes for SAMPs as well. Stakeholders indicated that Special Area Management Planning should be a medium to low priority for CZM. SAMPs may be a higher priority as a management tool under future §309 cycles given the reorganization that is underway between the Department of Sports, Parks, and Recreation and DPNR for coastal parks and recreation areas.

Ocean Resources

Section 309 Enhancement Objective: Planning for the use of ocean resources. §309(a)(7)

Phase I (High-Level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Understanding the ocean economy can help improve management of the resources it depends on. Using Economics: National Ocean Watch (ENOW),[41] indicate the status of the ocean economy as of 2015 (the most recent data) in the tables below. Include graphs and figures, as appropriate, to help illustrate the information. Note ENOW data are not available for the territories. The territories can provide alternative data, if available, or a general narrative, to capture the value of their ocean economy.

Status of Ocean and Great Lakes Economy for Coastal Counties (2012)[42]

	All Ocean Sectors	Living Resources	Marine Construction	Ship & Boat Building	Marine Transportation	Offshore Mineral Extraction	Tourism & Recreation
Employment (# of Jobs)	6,738	ND	ND	ND	214	ND	6524
Establishments (# of Establishments)	404	1	2	1	22	5	373
Wages (Millions of Dollars)	172,781,297	ND	ND	ND	11,030, 080	ND	161,751,217
GDP (Millions of Dollars)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

The USVI is not yet included in the publicly available ENOW data; therefore, NOAA's Office for Coastal Management developed an independent summary of Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) data for ocean-dependent sectors in the USVI and Puerto Rico using ENOW classifications. A review of the QCEW data by Clements et al. (2016) suggests that ENOW-defined activity accounts for only a small portion of the overall economies of the USVI. In the report, the authors provide examples within each sector, particularly living resources, and tourism, illustrating how ocean-dependent economies are undervalued using ENOW methodology. The NOAA Office for Coastal Management is in the process of developing a more comprehensive methodology for capturing ocean-dependent economic activity in the USVI and Puerto Rico. Table 2 below

[41] See *www.coast.noaa.gov/digitalcoast/tools/enow.html*.
[42] Clements et al. (2016). Note - this report relies on Bureau of Labor Statistics QCEW data from 2012

excerpted from Clements et al. (2016) illustrates employment and wage estimates for the USVI based on the six ENOW sectors. However, data from additional research, local data sources, as well as from in-person meetings led Clements et al. to determine that the QCEW data is underestimating

ENOW sector	Establishments	Employment	Total wages ($)
Living resources	1	ND[a]	ND
Marine construction	2	ND	ND
Marine transportation	22	214	$11,030,080
Offshore mineral resources	5	ND	ND
Ship and boat building	1	ND	ND
Tourism and recreation	373	6,524	$161,751,217
Total	**404**	**6,738**	**$172,781,297**

Table 2: Establishments, employment, and total average annual wages by ENOW sector for the USVI. Source: Clements et al., 2016. a. For industries below a certain size, BLS does not disclose employment and wage data for privacy purposes. These occurrences are noted using "ND" for non-disclosed.

the territory's ocean-dependent economic activity. The report indicates that most economic activity in the USVI can directly or indirectly be linked to the ocean. In the USVI tourism accounts for 60-80% of the territorial GDP. In addition to ocean-based tourism, recreation, marine transportation, fishing, and ship and boat building and repair are all components of the ocean-based economy in the USVI. Table 3 presents a summary of findings from in-person meetings and additional data sources collected by Clements et al. that are currently not included in ENOW.

ENOW ocean-dependent sector	Establishments (and employment) by ENOW industry	Findings from interviews and local data sources	Additional sectors/activity not included in ENOW
Living resources	1 seafood market on St. Thomas	• 200 to 250 active local fishermen, plus helpers and fish cleaners • $4.26 million in gross revenues for fishermen • 8+ seafood markets, 3 of which are government-run, the rest of which are informal operations • 1 aquaculture operation (UVI)	• Marine-based conservation organizations • Government-run marine-based programs (BLS reports 9 estimated with 97 employees) • UVI marine sciences program
Marine construction	2 privately owned establishments on St. Thomas, marine-related construction	• ENOW data seem reasonable • Research discovered 3 marine-construction-related companies, 2 on St. Thomas and 1 on St. Croix • These companies perform a variety of marine-related activities • VIPA and other government agencies contract out marine construction activities	• Company on St. Croix registered under NAICS codes not included in ENOW • Similar companies that provide ocean-related construction activities may be registered under: engineering services, other surveying and mapping services, environmental consulting services, all other support services, or other
Marine transportation	10 deep sea freight (173 employees) 5 marine passenger transportation services 7 marine transportation services	• ENOW data seem to underrepresent this sector • VIPA alone has 80 employees in the marine division • VIPA collected $22.4 million in wharfage and user fees in 2014 • Many cargo/freight companies, most of which have operations on the USVI if headquartered elsewhere • At least two water taxi companies	• Many marine cargo/freight companies registered under freight transportation arrangement (BLS reports 15 establishments) • WICO registered under freight transportation arrangement, with 77 employees • 4 companies with 46 employees registered under inland water transportation, likely ocean-based water taxis
Offshore mineral resources		• Extraction of offshore resources is prohibited in USVI • Very little economic activity in this sector • 1 or 2 companies that offer beach renourishment (sand is imported) • Oil and gas operations in ENOW dataset (St. Croix) likely not ocean-dependent	

ENOW ocean-dependent sector	Establishments (and employment) by ENOW industry	Findings from interviews and local data sources	Additional sectors/activity not included in ENOW
Ship and boat building	1 boat building establishment on St. Croix	• 15 to 20 boat repair and maintenance shops, 2 of which employ 50+ individuals, most have 2 to 4 employees • 4 boat/ship building companies, 1 employs approximately 40 people • Repair and maintenance shops • Recreational boaters and charter yachts often employ local residents (informally) for boat washing and some other related services	Boat maintenance and repair shops may be registered under alternative NAICS codes related to their specific service (e.g., woodworking) or a broader industry; some also may be registered under boat dealers (captured in ENOW tourism and recreation sector)
Tourism and recreation	39 (196 employees) amusement and recreation services 13 (60 employees) boat dealers 240 (2,463 employees) eating and drinking places 44 (3,510 employees) hotels and lodging places 7 (112 employees) marinas 2 (ND[a]) RV park and campgrounds 19 (85) scenic water tours 9 (98) zoos and aquaria	• Tourists include 570,000 overnight visitors, and 2.1 million cruise ship passengers/air excursionists from other islands (2013) • Tourist and cruise ship passenger expenditures equal $851 million and $381 million (2013) • Many self-employed individuals and small businesses in this sector • USVI HTA has 263 members, including 63 hotels, as well as airlines, restaurants, car rental agencies, retail shops, and more • 150+ charter yacht boats • 168 vendors operating in the National Park • 12+ recreational charter fishing operations • BER reports 8,339 employees for selected tourism sectors	Tourism sector is much larger than defined in ENOW; it also includes retail shops, taxis, car rental agencies, air transportation, tour operators, temporary staffing agencies, real estate/vacation rentals, bars, and likely portions of other sectors

Table 3: Summary of findings from in-person meetings and additional data sources. The research by Clements et al. highlights how the QCEW data underestimates ocean-dependent economic activity in the USVI. Source: Clements et al., 2016. a. For industries below a certain size, BLS does not disclose employment and wage data for privacy purposes. These occurrences are noted using "ND" for non-disclosed.

Other studies that have characterized the value of ocean economy in the USVI are described below.

An economic valuation of coral reefs in the USVI was completed in 2011. The Economic Value of the Coral Reef Ecosystems of the United States Virgin Islands (van Beukering, et al., 2011) includes substantive data that helps to quantify and enumerate components of the ocean-based economy in the USVI. In general, van Beukering et al. concluded that the USVI coral reef ecosystem is worth a conservative $202 million per year. Of this, $1.4 million was attributed to commercial fishing, $1.9 million to recreational fishing, $35 million to cruise passengers, $65 million to airline arrivals. The authors stressed the conservative nature of the estimate. It is important to note that this study only considered components of the ocean economy directly linked to coral reefs, which is a subset of the overall ocean-based economy.

The cruise industry is an important contributor to the USVI ocean-based economy. In the 2018 draft §309 Assessment it was reported that for the 2011/2012 cruise year, the USVI received $340 million in revenues from cruise passenger arrivals (Business Research and Economic Advisors, 2012). These revenues generated just under $140 million in wage income for an estimated 6,349 jobs. The USVI is consistently one of the top cruise destinations in the world and during the 2011/2012 cruise year, 2.1 million visitors arrived by cruise ship, the second highest in the region for that year. However, the impacts of hurricanes Irma and Maria in 2017 and the subsequent Covid-19 pandemic have resulted in declines in cruise landings in the territory. The table below shows changes in total cruise landings for

the USVI prior to the 2017 hurricane season through the initial years of the pandemic[43] according to the USVI Bureau of Economic Research. There were declines following the 2017 hurricane season as capacity to accommodate ships and visitors was reduced. There were also significant declines in cruise visitation due to pandemic-related cruise industry restrictions. However, rebuilding efforts and relaxed pandemic travel restrictions are allowing for increasing numbers of visitors to return to the territory. The USVI Bureau of Economic Research reports that territorial cruise landings from January through August of 2022 total 603,901[44].

Year	Total Cruise Landings	Change
2016	1,776,735	
2017	1,304,303	-26.6%
2018	1,430,702	+8.6%
2019	1,433,122	+0.2%
2020	440,398	-69.3%
2021	245,695	-44.4% (landings in St. Croix increased by 20% from 2020, however landings in St. Thomas/St. John declined by 47%)

To provide some perspective on the value of territorial ocean resources to the local economy, figures from the aforementioned economic analyses can be considered for the 2011-2012 timeframe. With a gross domestic product (GDP) of approximately $1.6 billion during 2011-2012, per capita, the coral reef ecosystem-based value of $202 million represented 13%, and cruise ship revenues 22% of the 2011-2012 GDP. These figures indicate that a high proportion of the territorial GDP is derived from ocean related income but does not adequately capture the full ocean economy of the USVI. It is important to note that overlap and omissions from both analyses are likely, and the full value of the ocean economy in the USVI has yet to be accurately characterized.

The islands are heavily dependent on ocean freight, though no specific economic figures are available. The V.I. Port Authority has indicated that 30% of cargo coming into St. Thomas arrives by cruise ship, and that with the decrease in cruise landings in 2020, cargo imports also decreased causing a loss of $9.2 million in marine revenues (Penn, 2022).

According to the NOAA Office for Coastal Management's Ocean Reports for the U.S. Virgin Islands State Waters[44], the economic totals, averaged over a five-year period from 2012 to 2016, for domestic commercial fish landings across the following species were:

Domestic Commercial Fish Landings for USVI (averaged across 2012-2016)[44]

Species	Annual Weight (lbs)	Annual Revenue	Price/lb.
Parrotfish	103,642	$532,385	$5.15
Dolphinfish	51,688	$349,747	$6.74
Triggerfish	58,843	$310,961	$5.27
Groupers, Red Hind	41,822	$253,378	$6.06

[43] See http://usviber.org/cruise-visitor-arrivals/
[44] See http://usviber.org/home/

Snappers, Other	36,287	$220,055	$6.08
Spiny Lobster	145,630	$1,186,170	$8.14
Conch meat	27,098	$183,320	$6.81

2. Understanding existing uses within ocean waters can help reduce use conflicts and minimize threats when planning for ocean resources. Using Ocean Reports[45], indicate the number of uses within ocean waters off of your state. For energy uses (including pipelines and cables, see the "Energy and Government Facility Siting" template following). Add additional lines, as needed, to include additional uses that are important to highlight for your state.

Uses within Ocean Waters[44]

Type of Use	Number of Sites	
Federal sand and gravel leases *(Completed)*	ND	
Federal sand and gravel leases *(Active)*	ND	
Federal sand and gravel leases *(Expired)*	ND	
Federal sand and gravel leases *(Proposed)*	ND	
Beach Nourishment Projects	ND	
Ocean Disposal Sites	ND	
Principle Ports *(Number and Total Tonnage)* *(data from VIPA viport.com)*	Cargo & Ferry STX – 3 STJ – 3 STT – 4	Cruise STX – 1 STT - 2
Coastal Maintained Channels	1 (within 1 nautical mile)	
Designated Anchorage Areas	6 (within 1 nautical mile)	
Danger Zones and Restricted Areas	0 **data provided in digital coasts shows the restricted areas near Culebra and Vieques but those are not within 1NM of USVI*	
Wastewater Outfalls	7	
Seafloor Infrastructure	2 pipeline areas, 6 submarine cable areas	
Endangered Species Act Critical Habitat Designations	Staghorn Coral – wherever found Elkhorn Coral- wherever found Leatherback Turtle – wherever found; 3.49% coverage St. Croix Ground Lizard – wherever found; 0.01% coverage Eggers' Century Plant – wherever found	
Protected Areas	18	

3. In the table below, characterize how the threats to and use conflicts over ocean resources in the state's or territory's coastal zone have changed since the last assessment.

[45] *www.coast.noaa.gov/digitalcoast/tools/ort.html*. Go to "Quick Reports" and select the "state waters" option for your state or territory. Some larger states may have the "Quick Reports" for their state waters broken into several different reports. Use the icons on the left-hand side to select different categories: general information, energy and minerals, natural resources and conservation, oceanographic and biophysical, transportation and infrastructure, and economics and commerce. Then scroll through each category to find the data to complete the table.

Significant Changes to Ocean Resources and Uses

Resource/Use	Change in the Threat to the Resource or Use Conflict Since Last Assessment (↑, ↓, –, unkwn)
OCEAN RESOURCES	THREATS
Benthic habitat (including coral reefs)	↑
Living marine resources (fish, shellfish, marine mammals, birds, etc.)	↑
Sand/gravel	unknown
Cultural/historic	↑
Other (please specify)	
OCEAN USES	CONFLICTS
Transportation/navigation	-
Offshore development[46]	-
Energy production	-
Fishing (commercial and recreational)	-
Recreation/tourism	-
Sand/gravel extraction	-
Dredge disposal	-
Aquaculture	-
Other (please specify)	

4. For the ocean resources and uses in the table above that had an increase in threat to the resource or increased use conflict in the state's or territory's coastal zone since the last assessment, characterize the major contributors to that increase. Place an "X" in the column if the use or phenomenon is a major contributor to the increase.

Major Contributors to an Increase in Threat or Use Conflict to Ocean Resources

	Land-based development	Offshore development	Polluted runoff	Invasive species	Fishing (Comm and Rec)	Aquaculture	Recreation	Marine Transportation	Dredging	Sand/Mineral Extraction	Ocean Acidification	Climate Change	Coral Disease
Benthic habitat (including coral reefs)	X		X	X							?	X	X
Living marine resources (fish, shellfish, marine mammals, birds, etc.)	X		X	X	X						?	X	
Cultural/historic	x		x	x								x	

[46] Offshore development includes underwater cables and pipelines, although any infrastructure specifically associated with the energy industry should be captured under the "energy production" category.

5. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of ocean resources or threats to those resources since the last assessment to augment the national data sets.

The 2021 Strategic Implementation Plan for Catalyzing a Blue Economy in the US Caribbean (Diaz, et al., 2021) indicates that coastal and marine ecosystems in the territory are being degraded and destroyed by increasing land-based pollution and sedimentation from uncontrolled tourism and rapid growth associated with the cruise industry, urbanization, and coastal development. These ecosystems are further threatened by an increased rate of fishery resource extraction, climate change impacts, and other environmental disturbances. These combined threats have significantly reduced the quantity and quality of coastal and marine habitats and diminished their resiliency and ability to recover.

Coral Reefs

The TCRMP 2019 Annual Report (Ennis, et al., 2019) provides data on the status and trends of coral habitat condition and fish assemblages within the territory. Summary information from this report on the impact of land-based development and runoff on coral reefs is provided in the Cumulative and Secondary Impacts section of this document.

The National Coral Reef Monitoring Program has documented an overall decline in coral cover, bleaching during the 2019 survey season, coral disease presence including but not limited to stony coral tissue loss disease (SCTLD), fish density differs inside and outside of national parks in the USVI (Edwards, et al., 2021).

According to the NOAA's 2020 Coral Reef Condition Status Report for the USVI[47] (based on data from 2014-2017), territorial reefs are in fair condition (Coral Reef Conservation Program, 2020). Coral cover and macroalgae cover are impaired, meaning that conditions are very impacted or have declined considerably. Fish are moderately to severely impacted and the sustainability of fish populations is considered critical. For climate, the territory has scored fair, which reflects how intensely climate-related impacts are negatively affecting coral reef health. Ocean acidification is a problem for USVI reefs, and reef material growth is impaired in the territory. More work needs to be done to raise awareness of coral reef issues and increase support for management actions. Management actions focused on controlling local threats such as pollution and overfishing could help improve reef health in the USVI and increase reef resilience to global challenges.

Invasive Species

The invasive Indo-Pacific lionfish is still widespread throughout the territory. The invasive red alga, *Ramicrusta*, has increased in abundance at some TCRMP locations and is killing coral tissue through competitive overgrowth. An invasive seagrass, *Halophila stipulacea*, is also present in the territory. Little is known on how *H. stipulacea* may be affecting USVI coastal ecosystems and communities, however data from research into habitat preferences of juvenile fish on St. Thomas indicates that *H. stipulacea* presence may be changing fish species composition in fish nursery habitats (Olinger, et al., 2017). Additional research on the impacts of invasives to community composition and function is

[47] See https://www.coris.noaa.gov/monitoring/status_report/

needed to help inform management actions. Through UVI and VI-EPSCoR there are ongoing investigations that may yield this type of information.

Fisheries

TCRMP data indicates that USVI reefs are affected by overexploitation of reef resources. St. Croix has an extremely low abundance of commercially important grouper species including the threatened Nassau grouper (Kadison, et al., 2017). As of 2015 Goliath and Nassau Grouper and Queen Conch were on NOAA's overfished list, and triggerfish, filefish, Caribbean Spiny Lobster, and wrasses on the overfished list (NOAA Fisheries, 2016). However, there are also some encouraging signs. More recent investigations under the Deep Coral Reef Monitoring Program at 30-50m depths is documenting higher abundances of commercially important species that what is observed in shallow waters, suggesting that viable populations exist within the territory and may serve as a base to rebuild stocks.

Climate Change

Impacts to territorial ocean resources from climate change are many including sea level rise, ocean acidification, increased frequency and intensity of storm events, drought, increased sea surface temperatures, etc. USVI reefs have exhibited varying responses to high thermal stress and bleaching events experienced in 2005, 2010, 2012, and 2019. The 2005 bleaching event resulted in the largest loss of coral in the USVI, with a 50% decline in coral cover at TCRMP shallow water sites (Ennis, et al., 2019). The loss of coral cover from the 2005 bleaching event surpassed all known coral losses due to impacts from physical damage, ecosystem changes, and pollution (Ennis, et al., 2019). SSTs in the USVI have been increasing at a rate of about 0.2C per decade since the 1980s, increasing the incidence of coral thermal stress and coral bleaching. It is expected that coral losses and other cascading ecosystem changes will continue and possibly increase due to continued effects from the changing climate.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if any significant state- or territory-level changes (positive or negative) in the management of ocean resources have occurred since the last assessment?

Significant Changes to Management of Ocean Resources

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	N/A	N
Regional comprehensive ocean management plans	N	N/A	N
State comprehensive ocean management plans	N	N/A	N
Single-sector management plans	N	N/A	Y

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

CZM updated the USVI Coral Reef Priorities for 2020-2025. This document guides coral reef management actions in the territory with support from NOAA CRCP. The priorities document provides a suite of wide-ranging coral reef management goals, objectives, and activities and a list of high-priority geographic areas within which to focus management or protection interventions. The four goal areas prioritized for development and action for 2020-2025 are: land-based sources of pollution, enforcement, restoration and interventions, and communication. The priority sites identified for management intervention are STEER, St. Croix East End Marine Park, and Salt River; sites prioritized for protection are Brewers/Perseverance, Cane Bay, and Salt River.

In 2019, during the process of revising the coral reef management priorities, Stony Coral Tissue Loss Disease (SCTLD) was reported in St. Thomas. It has since spread throughout the entire USVI and has been documented on almost every reef. SCTLD has caused major coral losses in Florida[48] and unfortunately the data are showing similar trends for USVI reefs[49] (Ennis, et al., DRAFT). The VI Coral Reef Advisory Group has formed a Coral Disease Advisory Committee to leverage resources to address SCTLD, its impacts on USVI reefs, and to expedite disease responses. In 2020, a Coral Disease Response Plan for the USVI was produced (Meiling, et al., 2020).

Under the last A&S reporting cycle, the USVI and Puerto Rico, through their respective coastal zone management programs initiated the establishment of the Caribbean Regional Ocean Partnership. Efforts to advance coastal and marine spatial planning in alignment with the National Ocean Commission and in collaboration with regional organizations such as the Caribbean Coastal Ocean Observing System (CARICOOS), the Caribbean Fisheries Management Council, Sea Grant, and the Caribbean Coral Reef Institute were undertaken. However, federal funding to support the Caribbean Regional Ocean Partnership work terminated in 2014, and while a data portal has been created and is now maintained and updated by CARICOOS at www.caribbean-mp.org, efforts to develop the Caribbean Regional Plan have stalled due to lack of funding. If this initiative were to be prioritized it could lead to significant positive changes in ocean resource management for the territory and wider US Caribbean region.

The Caribbean Fisheries Management Council has released a proposed rule to implement island-based fishery management plans for the territory[50]. This would shift the management approach from a one-size fits all regulatory strategy for the entire territory to an island-based approach. Territorial fishers have long advocated for a shift toward island-based fishery management due to differences in the

[48] See https://floridakeys.noaa.gov/coral-disease/
[49] See https://www.vicoraldisease.org/
[50] See https://caribbeanfmc.com/fishery-management/island-based-fmps

fisheries between the St. Thomas/St. John and St. Croix district. The proposed rule to implement the island-based fishery management plans is currently open for public comment (as of June 2022).

3. Indicate if your state or territory has a comprehensive ocean management plan.

Comprehensive Ocean/Great Lakes Management Plan	State Plan	Regional Plan
Completed plan (Y/N) (If yes, specify year completed)	N	N
Under development (Y/N)	N	N
Web address (if available)	-	-
Area covered by plan	N/A	N/A

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High _____
Medium __X__
Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

CZM acknowledges the importance of ocean resources, particularly with ongoing applications for marine internment, water-based obstacle courses, beach renourishment, and sand reclamation in additional to the more typical CZM applications which can negatively impact ocean resources. However, CZM has chosen to rank ocean resources as a medium priority relative to other enhancement areas for this assessment cycle in part because there is consensus that issues affecting ocean resources can be partially addressed through strategies developed for the other enhancement areas ranked as high priority (e.g., coastal hazards, wetlands). Stakeholders indicated that ocean resources should be a medium priority for CZM.

Energy and Government Facility Siting

Section 309 Enhancement Objective: Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance. §309(a)(8)[51]

Phase I (High-Level) Assessment:

Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, characterize the status and trends of different types of energy facilities and activities in the state's or territory's coastal zone based on best-available data. If available, identify the approximate number of facilities by type. For ocean-facing states and territories, Ocean Reports[52] includes existing data for many of these energy facilities and activities.

Status and Trends in Energy Facilities and Activities in the Coastal Zone

Type of Energy Facility/Activity	Exists in Coastal Zone (# or Y/N)	Change in Existing Facilities/Activities Since Last Assessment (↑, ↓, –, unkwn)	Proposed in Coastal Zone (# or Y/N)	Change in Proposed Facilities/Activities Since Last Assessment (↑, ↓, –, unkwn)
Energy Transport				
Pipelines	N	-	N	-
Electrical grid (transmission cables)	Y	-	N	-
Ports	Y	↑	Y	↑
Liquid natural gas (LNG)	2	↑	Y	↑
Other (please specify)				
Energy Facilities				
Oil and gas	Y	↓	N	-
Coal	N	-	N	-
Nuclear	N	-	N	-
Wind	N	-	N	-

[51] CZMA § 309(a)(8) is derived from program approval requirements in CZMA § 306(d)(8), which states:
"The management program provides for adequate consideration of the national interest involved in planning for, and managing the coastal zone, including the siting of facilities such as energy facilities which are of greater than local significance. In the case of energy facilities, the Secretary shall find that the State has given consideration to any applicable national or interstate energy plan or program."
NOAA regulations at 15 C.F.R. § 923.52 further describe what states need to do regarding national interest and consideration of interests that are greater than local interests.

[52] *www.coast.noaa.gov/digitalcoast/tools/ort.html.* Select "Quick Reports" and then enter your state. Select the Quick Reports for "coastal waters" off of your state. Depending on the size of the state, there may be more than one "coastal waters." If so, you will need to add the data from all reports to complete the table. Click on the wind turbine icon on the left ("Energy and Minerals") for information on energy facilities. While outside your coastal zone, you may also want to consider facilities/activities in "Federal Waters" that may have effects on your coastal zone.

Type of Energy Facility/Activity	Exists in Coastal Zone (# or Y/N)	Change in Existing Facilities/Activities Since Last Assessment (↑, ↓, –, unkwn)	Proposed in Coastal Zone (# or Y/N)	Change in Proposed Facilities/Activities Since Last Assessment (↑, ↓, –, unkwn)
Wave	N	-	N	-
Tidal	N	-	N	-
Current (ocean, lake, river)	N	-	N	-
Hydropower	N	-	N	-
Ocean thermal energy conversion	N	-	N	-
Solar	3	↑	4	↑
Biomass	N	-	Y	↑
Other (Biogas)	N	-	N	↓
Other (Landfill Gas)	N	↑	N	↓
Other (Waste to Energy)	N	-	N	-

2. If available, briefly list and summarize the results of any additional state- or territory-specific information, data, or reports on the status and trends for energy facilities and activities of greater than local significance in the coastal zone since the last assessment.

The USVI has no fossil energy resources and imports petroleum products to meet its energy needs including operating vehicles and boats, generating electricity, and to desalinate water for the public water supply. The USVI government has committed to reducing petroleum use in the territory by 60% by 2025. The USVI legislature approved targets for renewables to account for 25% of the VI Water and Power Authority's (WAPA) peak generating capacity by 2020, 30% by 2025, and 50% by 2044. The 2020 goal was not met. Solar power currently accounts for all of the USVI's renewable electricity.

Since the last §309 assessment efforts to reduce the territory's reliance on fossil fuels and expand renewables have continued. Hurricanes Irma and Maria significantly damaged much of the existing energy infrastructure that the territory relies on. As part of the rebuilding process efforts have been made to plan a route forward that will increase the resiliency of the territory's grid to future storm events including upgrading equipment, implementing microgrids, moving transmission and distribution circuits underground, ramping up renewables including solar and wind, and utilizing battery energy storage systems (Virgin Islands Water and Power Authority, 2020). The emphasis on rebuilding for increased resiliency of the grid and on utilizing renewable energy technologies will likely require consideration of impacts within the coastal zone when siting projects.

The existing large-scale solar farms located at the Cyril E. King airport and Estate Donoe in St. Thomas, and at Spanish Town in St. Croix, which were providing more than eight (8) megawatts of power were destroyed by the hurricanes. The farms were offline while they and the islands' electric grids were repaired but are back in operation. Rooftop solar adds about 17 megawatts of generating capacity though WAPA's net metering program.

WAPA has plans to add wind generating capacity to their portfolio as well. Sites at Longford in St. Croix and Bovoni in St. Thomas have been identified as suitable for wind farms. The WAPA governing board in 2021 approved a wind power purchase agreement for a wind farm at Bovoni Point. The facility will be comprised of six wind turbines and will produce approximately 10 megawatts of wind energy which will be purchased by WAPA.

Limetree Bay Terminals opened on the site of the former Hovensa refinery in 2018 as a petroleum terminal facility. Limetree Bay resumed refining operations in 2021 briefly before shutting down again indefinitely a couple of months later. Limetree Bay was subsequently sold to St. Croix Energy LLP later in 2021, who plans to resume operations in the future.

The U.S. Department of Energy announced in 2022 that it was providing funding for a prototype ocean thermal energy system to produce power, desalinated water, and carbon-free ammonia for a renewables-powered EcoVillage planned for St. Croix.

3. Briefly characterize the existing status and trends for federal government facilities and activities of greater than local significance[53] in the state's coastal zone since the last assessment.

According to the General Services Administration, there are fifteen government owned or leased buildings in the USVI (government offices or judicial buildings). The federal court buildings on St. Croix and St. Thomas each have solar systems that sustain or facilitate their own electric needs. There are currently no existing or proposed federal facilities of greater than local significance in the USVI.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) that could facilitate or impede energy and government facility siting and activities have occurred since the last assessment.

Significant Changes in Energy and Government Facility Management

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	N	N/A	N
State comprehensive siting plans or procedures	N	N/A	N

[53] The CMP should make its own assessment of what Government facilities may be considered "greater than local significance" in its coastal zone, but these facilities could include military installations or a significant federal government complex. An individual federal building may not rise to a level worthy of discussion here beyond a very cursory (if any at all) mention).

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

There have been no significant changes to regulation or siting plans or procedures for energy and government facilities.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	_____
Low	__X__

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

While interest in, and scoping activities for, energy projects or government facilities that might impact the coastal zone such as fuel bunkering, undergrounding, wind turbines, wave action, and solar projects are increasing, these are not a priority for this assessment cycle. It is likely this will need to be reconsidered and planned for in future §309 assessment cycles. Stakeholders indicated that energy and government facility siting should be low priority for CZM.

Aquaculture

Section 309 Enhancement Objective: Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable states to formulate, administer, and implement strategic plans for marine aquaculture. §309(a)(9)

Phase I (High-Level) Assessment:
Purpose: To quickly determine whether the enhancement area is a high-priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, characterize the existing status and trends of aquaculture facilities in the state's coastal zone based on the best-available data.

Status and Trends of Aquaculture Facilities and Activities

Type of Facility/Activity	Number of Facilities	Approximate Economic Value	Change Since Last Assessment (↑, ↓, –, unkwn)
Commercial-Private Tilapia	1	10,000~	-
University Tilapia	3	650,000~	-
Public	0	-	-

2. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends or potential impacts from aquaculture activities in the coastal zone since the last assessment.

Efforts to expand aquaculture in the USVI have increased since the last §309 assessment. Ground was broken in 2020 for a new land-based facility, Freshministries Aquaponics Center, on St. Croix. This facility is an incubator funded by ~$2M Economic Development Administration grant, in partnership with Farmers In Action and will house the Fueling Entrepreneurship and Economic Development program, which provides hands-on training and classroom sessions to those interested in owning, managing, or working within the aquaponics field.

Data from the 2018 U.S. Department of Agriculture Census of Agriculture for the USVI (U.S. Department of Agriculture, 2020) is consistent with the numbers listed above for aquaculture activities. Current aquaculture activities in the USVI consist of raising tilapia in tanks. Economic data for the USVI aquaculture facilities is not included in the Agriculture Census to avoid disclosing data for individual operations.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any state- or territory-level changes (positive or negative) that could facilitate or impede the siting of public or private aquaculture facilities in the coastal zone.

Significant Changes in Aquaculture Management

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Aquaculture comprehensive siting plans or procedures	N	N/A	N
Other aquaculture statutes, regulations, policies, or case law interpreting these	N	N/A	N

There have been renewed efforts to activate the VI Commission on Aquaculture and Mariculture pursuant to Act 6471 as amended, with a Board comprised of the following members:

- Terrance Nelson, Commissioner, USVI Department of Agriculture
- Dr. Nicole Angeli, Director, DPNR Division of Fish and Wildlife
- Dr. Tom Zimmerman, Director, UVI Agriculture Experiment Station
- William Tobias, Biologist (retired)
- Kirk Lewis, Aquaculturist, USVI Dept. of Agriculture
- Gerson Martinez, member, St. Croix Fisheries Advisory Council

There have been communications between the Commission members and staff from NOAA's Aquaculture Office and NMFS HCD. Potential sources of funding through the U.S. Department of Agriculture have been identified to support Commission operations.

2. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

There have not been any significant changes to aquaculture plans, procedures, or regulations. The aforementioned Board is working to establish a five-year VI Aquaculture Plan, which would potentially be a significant change and would establish a regulatory framework by which to protect the environment, public health, and allow for the introduction/expansion of the industry within the USVI. UVI has developed an Aquaculture Program to develop aquaculture systems to address the needs of

farmers in the USVI and wider Caribbean region. This program may yield significant new procedures or result in advances that would require greater consideration by CZM.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	_____
Low	__X__

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

CZM is involved if there are facilities to be permitted in the coastal zone, and CZM is aware that there are socio-cultural factors associated with aquaculture that may become more significant in the future. Currently the Department of Agriculture is still working out issues of how to advance this industry in the territory. Stakeholders indicated that aquaculture should be a low priority for the CZM §309 program. CZM considers aquaculture a low priority for this §309 assessment cycle.

ASSESSMENT: PHASE II

Wetlands

In-Depth Resource Characterization:
Purpose: To determine key problems and opportunities to improve the CMP's ability to protect, restore, and enhance wetlands.

1. What are the three most significant existing or emerging physical stressors or threats to wetlands within your coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout your coastal zone, or are there specific areas that are most threatened? Stressors can be development/fill; hydrological alteration/channelization; erosion; pollution; invasive species; freshwater input; sea level rise/Great Lakes level change; or other (please specify). When selecting significant stressors, also consider how climate change may exacerbate each stressor.

	Stressor/Threat	**Geographic Scope** (throughout coastal zone or specific areas most threatened)	**Effect of Climate Change on Stressor**
Stressor 1	Alteration of hydrology	Certain wetland areas have been intentionally modified for development projects; some have been altered over time through infilling from sedimentation from upland sources	Hurricanes and extreme rainfall events can impact wetland hydrology in both the short and longer term. Sea level rise may impact vegetative communities in wetland habitats and affect their function as natural barriers, filters, and buffers.
Stressor 2	Coastal development/fill & excavation	Throughout the coastal zone	In response to sea level rise, coastal development can result in shoreline hardening and subsequent increased erosion, sedimentation, and transport of nutrients and contaminants into wetlands.
Stressor 3	Pollution	Throughout coastal zone, but also concentrated in wetland areas adjacent to urban and industrial areas	Extreme rainfall events can lead to increased erosion, sediment, nutrient, and pollutant loads being transported to wetland areas.

2. Briefly explain why these are currently the most significant stressors or threats to wetlands within your coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

Numerous watershed management plans commissioned by CZM (described in the Phase I Assessment) have documented that territorial wetlands are impacted by altered hydrology (both intentional fill for a particular development and incidental fill associated with erosion and runoff), coastal development

activities, and pollution. Coastal development such as land clearing and creating unpaved roads without implementation of adequate sediment control and mitigation measures cause erosion and generate sedimentation that is delivered to coastal wetlands, seagrass areas, and coral reefs. Lack of septic tanks or use of inadequate septic systems have also been documented as sources of pollution that affect wetlands and other coastal habitats. The USVI Coral Reef Management Priorities (Rothenberger & Henderson, 2019) prioritized addressing land-based sources of pollution as the top management goal, and prioritized objectives include addressing threats from stormwater, land-based sources of pollution, and sewage infrastructure. In addition, key stakeholders identified 1) hydrologic alteration to wetlands, 2) coastal development including filling or excavating wetlands for coastal structure, and 3) degradation of wetlands caused by pollution as the top three stressors impacting USVI wetlands.

3. Are there emerging issues of concern but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Emerging Issue	Information Needed
Incompatible land use designation / zoning of wetland parcels	Inventory of wetland parcels; research into policy implications of certain land use designations (zoning) on the CZM process to manage wetlands
Sargassum	How sargassum mats are affecting wetland areas; distribution and incidence of sargassum accumulation; methods to remove sargassum from wetland areas without damaging habitat

In-Depth Management Characterization:
Purpose: To determine the effectiveness of management efforts to address identified problems related to the wetlands enhancement objective.

1. For each additional wetland management category below that was not already discussed as part of the Phase I assessment, indicate if the approach is employed by the territory and if significant territory-level changes (positive or negative) have occurred since the last assessment.

Significant Changes in Wetland Management

Management Category	Employed By State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Wetland assessment methodologies	Y (project-based, not comprehensive program)	N/A	Y in process
Wetland mapping and GIS	Y (project-based, not comprehensive program)	N/A	Y in process
Watershed or special area management plans addressing wetlands	Y	N/A	Y in process
Wetland technical assistance, education, and outreach	N	N/A	N
Other (please specify)			

2. For management categories with significant changes since the last assessment, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.
    a. Describe significant changes since the last assessment;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

There are currently several wetland assessments, wetland mapping, wetland contaminant studies, and watershed management planning efforts underway that will provide information that can be used to improve management of territorial wetlands. These projects are discussed in greater detail in the Phase I Assessment sections on Wetlands, Coastal Hazards, Cumulative and Secondary Impacts.

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the territory's management efforts in protecting, restoring, and enhancing coastal wetlands since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the territory's management efforts?

There are no new studies since the last A&S, but there have been several reports in the past that provide findings, highlight needs, and offer recommendations on the USVI's management efforts to protect, restore, and enhance coastal wetlands. Some of the common themes are:

Data and information on wetlands: The USVI do not have any consistent monitoring programs, nor any comprehensive local trend data for territorial wetlands. Current, consistent status and trends data for wetlands would allow the program to identify threats, restoration sites, and prioritize and assess the effectiveness of management efforts. Such data could also be used to inform and improve zoning, policy, and regulatory decisions. The data that does exist, which is derived from CZM permit applications and project-specific research, assessment, monitoring, and mapping efforts is not managed in a way to maximize its use to inform effective wetland management, nor is it widely available to agency staff or the public.

Need for increased enforcement, regulations, and policies: Key stakeholders responding to the CZM §309 Assessment questionnaire identified that the greatest opportunities/needs to improve management of wetlands in the USVI are: 1) improving enforcement capacity, 2) restoration of wetland areas, and 3) improved or enhanced regulatory programs including land use policies and ordinances to conserve wetlands. Increasing the ability to effectively enforce existing rules, regulations, and laws is also identified as a priority goal in the 2020-2025 USVI Coral Reef Management Priorities. There are existing laws and regulations that pertain to territorial wetlands at both the federal and territorial levels. Existing legislation for the protection and management of territorial wetlands are summarized in Wetlands of the U.S. Virgin Islands 2010 Edition (Conservation Data Center, 2010). At the federal level these include the Clean Water Act, the CZMA, and the Emergency Wetlands Resources Act. Locally, the following sections of the V.I. Code are relevant:

- Title 7, Ch. 3 – Soil Conservation
- Title 12, Ch. 1 – Wildlife
- Title 12, Ch. 2 – Protection of Indigenous, Endangered, and Threatened Fish, Wildlife and Plants
- Title 12, Ch. 3 – Trees and Vegetation Adjacent to Watercourses
- Title 12, Ch. 5 – Water Resources Conservation
- Title 12, Ch. 7 – Water Pollution Control
- Title 12, Ch. 13 – Environmental Protection
- Title 12, Ch. 21 – VI Coastal Zone Management

Need for a unified wetland management framework or plan: The need for a comprehensive wetland management strategy or plan for the USVI has been noted before, and there have been unsuccessful attempts to establish such a plan in the past (Environmental Support Services, 2010). Creating and implementing such a strategy has been problematic, in part because there are many programs that deal with environmental and development issues in which wetlands have a critical role or use. In some instances, the roles and uses of wetlands conflict between programs. The purpose of a unified approach to wetlands management for the USVI would be to ensure that all wetland management interventions are designed based on a single policy and strategy and that institutional arrangements are structured to minimize waste and conflict, and to maximize impacts of each management intervention. Key stakeholders indicated that improved planning was the fourth greatest opportunity/need to improve management of wetlands in the USVI.

Identification of Priorities:

1. Considering changes in wetlands and wetland management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to more effectively respond to significant wetlands stressors. *(Approximately 1-3 sentences per management priority.)*

   Management Priority 1: Improve enforcement of existing CZM, wetland, resource protection, and land use laws and regulations to protect coastal wetlands.

   Description: Develop materials to increase agency staff (permitting and enforcement) awareness of regulations and policies to conserve wetlands (e.g., CZM permit review guidance, training, and educational content). Identify and create opportunities (trainings, site visits, etc.) to engage enforcement personnel to increase awareness of wetland regulations and enforcement actions.

   Management Priority 2: Restoration of coastal wetlands

   Description: Identify and prioritize wetland restoration needs for the USVI, develop, and implement restoration projects.

Management Priority 3: Enhance regulatory programs including policies, ordinances, etc. to protect, manage, and restore wetlands, and incorporate climate change adaptation principles.

Description: Develop a comprehensive wetlands conservation and management policy and plan that would create a unified approach to wetland management for the territory. Such a plan would include a review of relevant laws and regulations (and clarification and updates for consistency if needed), identification of agency roles and responsibilities for wetland protection, mitigation, and restoration, identification of conflicts or incompatible uses of wetland resources and those wetlands providing multiple ecosystem services, update regulations (e.g., setbacks, buffer zones) to accommodate impacts to wetlands associated with coastal erosion and other high-risk coastal hazards and to provide for the migration of coastal wetlands, and guidance on restoration priorities.

2. Identify and briefly explain priority needs and information gaps the CMP has to help it address the management priorities identified above. The needs and gaps identified here do not need to be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Research	Y	Territory wide consistent wetland monitoring program; research into stressors and threats, and restoration approaches that can be used to inform management and policy, wetland migration or change studies
Mapping/GIS	Y	Wetlands inventory, habitat characterization, extent, and condition information are needed to inform management and policy decisions
Data and information management	Y	Existing data on wetlands needs to be compiled, managed, and made more widely available to support agency processes, and management and policy decisions
Training/capacity building	Y	Training for DEE officers on laws and regulations for wetlands; training to identify and accurately document violations. Training for agency staff on incorporating climate change into planning and permitting decisions.
Decision-support tools	Y	
Communication and outreach	Y	Education and outreach materials that highlight the value of wetlands; educational opportunities to learn about regulatory programs and wetland protection BMPs for developers, engineers, contractors, and landowners.

Enhancement Area Strategy Development:

1. Will the CMP develop one or more strategies for this enhancement area?

Yes _____
No __X____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

The CZM program acknowledges that wetlands are a high priority enhancement area for the USVI, and there is a need to develop a comprehensive wetland policy for the territory. However, this action is not practical currently under this §309 cycle due to the expected amount of §309 funding available and the likelihood of success. Several of the potential actions identified under the coastal hazards and public access enhancement areas can provide enhanced protections for wetlands.

Coastal Hazards

In-Depth Resource Characterization:

Purpose: To determine key problems and opportunities to improve the CMP's ability to prevent or significantly reduce coastal hazard risks by eliminating development and redevelopment in high-hazard areas and managing the effects of potential sea level rise and Great Lakes level change.

1. Based on the characterization of coastal hazard risk, what are the three most significant coastal hazards[54] within your coastal zone? Also indicate the geographic scope of the hazard, i.e., is it prevalent throughout the coastal zone, or are there specific areas most at risk?

	Type of Hazard	Geographic Scope (throughout coastal zone or specific areas most threatened)
Hazard 1	Coastal storms (coastal flooding, wind damage, and storm surge)	Coastlines, urban areas
Hazard 2	Flooding (riverine, stormwater)	Coastlines, urban areas, ghuts, and coastal fill lands
Hazard 3	Shoreline erosion	Bluffs, Beaches, vegetated shorelines territory-wide

2. Briefly explain why these are currently the most significant coastal hazards within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

   These hazards were identified as being the top threats to critical infrastructure, vulnerable communities, as well as critical natural infrastructure. Current work being done on the Coastal Vulnerability Index and Hazard Mitigation and Resilience Plan indicates that the three coastal hazards identified above are responsible for the most significant impacts to the USVI coastal zone and create the most risk for the territory's communities. The 2019 Territorial Hazard Mitigation Plan also recognizes hurricanes (storms) and flooding (includes erosion) as two of the top hazards impacting the USVI. Threats from stormwater and erosion have been identified as management priorities in the USVI Coral Reef Management Priorities (Rothenberger & Henderson, 2019). Additionally, key stakeholders identified 1) coastal storms, 2) coastal flooding events, and 3) shoreline erosion as the coastal natural hazards presenting the greatest threat to the USVI.

3. Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Emerging Issue	Information Needed
Sargassum	Quantify amount and track change; location (document/map/predict affected areas); contamination issues; uses; methods to deflect or remove
Drought	Lack of long-term monitoring data (e.g., precipitation, soil moisture), locally relevant modeling data to project rainfall (inter- and intra-island), more

[54] See list of coastal hazards on pg. 24 of this assessment template.

	detailed soil and land cover assessments (local variation, etc.). There is also a lack of understanding on options and resources for implementing various water conservation solutions to prepare for and mitigate drought (e.g., drip irrigation, green infrastructure, etc.).

The volume of sargassum washing ashore in the territory has been increasing for several years. Sargassum negatively impacts the territorial economy, socio-cultural uses of the shoreline, as well as ecological and human health. The current CZM regulatory authority and process is not sufficient to effectively and expeditiously address the removal of sargassum that has washed ashore. As a result, non-permitted removal activities are occurring which may have negative impacts on other coastal resources. Climate change impacts such as drought are creating additional challenges to the removal of sargassum because fresh water to rinse the sargassum so it may be used as livestock feed is in increasingly short supply. DPNR has recently initiated efforts to develop a sargassum blueprint which would investigate existing policies that would govern its removal, and identify immediate and longer-term management recommendations (e.g., identifying uses for collected sargassum, potential regulation and policy revisions needed). Another option being explored by DPNR as an immediate response to the increasing presence of sargassum is the potential use of deflection booms to keep it from coming ashore.

It is estimated that drought conditions will become more frequent and persist for longer durations in the territory. Drought is becoming a chronic hazard rather than an intermittent one. There are limited surface and ground water resources in the USVI, so rainfall is vital to both recharge natural systems and to the capture and storage for personal human uses. Drought has economic, ecological, social, psychological, and health impacts. The USVI was included in the U.S. Drought Monitor (USDM) in 2019. The USDM is a map released every Thursday, showing parts of the U.S. that are in drought. The map uses five classifications: abnormally dry, showing areas that may be going into or are coming out of drought, and four levels of drought: moderate, severe, extreme, and exceptional. The USVI is also a participant in the Community Collaborative Rain, Hail, and Snow Network which is an organization of volunteers that collect high quality, real-time data on daily precipitation, allowing researchers to better identify trends. Drought management in the USVI is not just about rain and water quantities, but better management of territorial water needs. The increasing frequency, duration, and severity of drought conditions are factors to be considered in mitigation and restoration project design, BMP selection, and in policy development. Increasing resiliency to drought should inform permitting conditions such as the use of permeable versus impermeable surfaces or special conditions for larger developments to increase rain capture/cistern capacity that could be used to support community needs.

Drought can also intersect with other factors to further stress freshwater availability. For example, recent Sargassum blooms impacted freshwater intakes at territorial water processing facilities, further exacerbating existing water shortages from a long-term ongoing drought. Sargassum and drought are both emerging threats that are increasing in incidence and duration

in the USVI. Strategies and plans to effectively predict and prepare for these emerging threats are needed.

In-Depth Management Characterization:

Purpose: To determine the effectiveness of management efforts to address identified problems related to the coastal hazards enhancement objective.

1. For each coastal hazard management category below, indicate if the approach is employed by the territory and if there has been a significant change since the last assessment.

Significant Changes in Coastal Hazards Statutes, Regulations, and Policies

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Change Since the Last Assessment (Y or N)
Shorefront setbacks/no build areas	Y	N/A	N
Rolling easements	N	N/A	N
Repair/rebuilding restrictions	Y	N/A	N
Hard shoreline protection structure restrictions	N	N/A	N
Promotion of alternative shoreline stabilization methodologies (i.e., living shorelines/green infrastructure)	N	N/A	N
Repair/replacement of shore protection structure restrictions	N	N/A	N
Inlet management	N	N/A	N
Protection of important natural resources for hazard mitigation benefits (e.g., wetlands, barrier islands, coral reefs) (other than setbacks/no build areas)	Y	N/A	N
Repetitive flood loss policies (e.g., relocation, buyouts)	N	N/A	N
Freeboard requirements	Y	N/A	N
Real estate sales disclosure requirements	N	N/A	N
Restrictions on publicly funded infrastructure	N	N/A	N
Infrastructure protection (e.g., considering hazards in siting and design)	N	N/A	N
Other (please specify)			

Significant Changes to Coastal Hazard Management Planning Programs or Initiatives

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Change Since the Last Assessment (Y or N)
Hazard mitigation plans	Y	N/A	Y/in-process
Sea level rise or climate change adaptation plans	Y *(an agency-level adaptation plan has been produced for DPNR-CZM)*	N/A	N
Statewide requirement for local post-disaster recovery planning	N	N/A	N
Sediment management plans	Y *(guidelines on potential sources exist)*	N/A	N
Beach nourishment plans	N	N/A	N
Special Area Management Plans (that address hazards issues)	N	N/A	N
Managed retreat plans	N	N/A	N
Drought Plan	N	N/A	N
Sargassum Plan *(blueprint currently in development)*	N	N/A	N

Significant Changes to Coastal Hazard Research, Mapping, and Education Programs or Initiatives

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Change Since the Last Assessment (Y or N)
General hazards mapping or modeling *(UVI, HMRP)*	Y	N/A	Y
Sea level rise mapping or modeling *(UVI)*	Y	N/A	Y
Hazards monitoring (e.g., erosion rate, shoreline change, high-water marks) *(UVI, HMRP)*	Y	N/A	Y
Hazards education and outreach *(Storm Strong Program – UVI & CZM)*	Y	N/A	Y
Drought *(through HMRP)*	Y	N/A	Y

2. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's management efforts in addressing coastal hazards since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's management efforts?

There are several sources that provide findings, identify needs, and offer recommendations on the USVI's efforts to manage coastal hazards. Some of the most relevant include:

- NOAA Section 312 evaluation (2018)
- 2019 Territorial Hazard Mitigation Plan
- 2020 DPNR Climate Change Preparedness Assessment
- 2021 South Atlantic Coastal Study USVI Appendix
- Draft Coastal Vulnerability Index
- Draft USVI Hazard Mitigation and Resilience Plan

There are several common themes across these documents including:

- There are regulatory, policy, and enforcement gaps and insufficiencies that allow development and redevelopment to continue in high-risk and vulnerable locations. There is a need to **address these legal gaps and deficiencies to more adequately address the threats posed by coastal hazards**. Some suggestions to address these legal gaps include revising and updating:

  Setback requirements – Make regulatory changes to enhance community and ecosystem resilience. The current setbacks in the Open Shorelines Act are outdated. The setbacks do not consider the dynamic nature of shorelines as a result of climate change impacts. Also, there is a need to make setbacks in the Open Shorelines Act and zoning districts more consistent and/or complementary. Some suggestions include using variable setbacks based on factors such as the size and type of development, lot size, type of shoreline, and existing and potential hazards at the site. Whatever form they take the setbacks will need to be legally defensible.

  Impervious surface vs. open space coverage requirements for the R1 and R2 Zoning Districts – The current zoning is as follows:

  - R1 Zone allows two dwelling units per lot and all principal residential structures shall occupy not more than 25% of the area of the zoning lot.
  - R2 Zone allows two dwelling units per lot and all principal residential structures shall occupy not more than 30% of the area of the zoning lot.

  There is a need to limit the permitted footprint of the ***entire*** residential development and by extension the impervious surface coverage, rather than just the principal residential structures to 25% and 30% of the lot respectively, to close the existing loophole and minimize the amount of flooding, erosion, and runoff from new residential development. The residential lot density zoning law needs to be amended.

  Rebuild requirements – There is a CZM permit regulatory gap for the rebuilding of existing structures in that existing structures are exempted from CZM permitting requirements.

  Subdivision requirements – Subdivisions are treated as minor permits and do not require an in-depth consideration of how hydrology, rainfall, or potential climate

impacts might affect the project regardless of their size and impact. There is a need to address this regulatory gap.

The two-tier system – The entire USVI is within the coastal zone, but it is divided into two tiers. Permitting of development is managed differently depending on the tier development will occur in. The geography of the islands coupled with the current permitting approach to development in Tier 2 often results in erosion, runoff, and ultimately downstream/downghut flooding which then causes impacts to Tier 1. There have been several ideas proposed to address these challenges, and to reduce and mitigate impacts to the coastal zone more effectively. Suggestions have included:

- Move to a single tier system.
- Move the Tier 1 boundary inland to the 300-foot contour.
- Adopt review criteria that is consistent with Tier 1 for certain types of significant development activities regardless of location.
- Revise the review of earth change activities so that activities in or adjacent to ghuts within Tier 2 are consistent with procedures of the CZM program in Tier 1

There are potential benefits and drawbacks associated with each of these suggested options. As noted in the 2018 NOAA §312 Evaluation, moving to a single tier system would allow major development activities to be reviewed more consistently, however it would significantly increase the number of permit applications requiring CZM review without guarantees that they would be able to hire additional permit staff to process them. The current staffing levels cannot absorb a change like this. If it were decided to apply Tier 1 permitting procedures to select developments in the second tier, it would allow for expanded public participation and appeals which have been identified as additional needs, it might also potentially result in more rigorous review. However, some activities in the second tier might be missed, and therefore opportunities to reduce coastal hazards also missed. There is a need for CZM to better address the underlying hazards such as erosion, runoff, flooding, and sedimentation originating from development in Tier 2.

- Reduce exemptions, variances, and waivers of existing land use regulations.

- Restructure, coordinate, and make consistent the permitting processes by CZM, Building Permits and Environmental Protection, to ensure earth change and development activities are managed consistently in both Tier 1 and Tier 2. Involve Comprehensive and Coastal Zone Planning in the process to ensure that zoning decisions are consistent with the goals of the revised and standardized permit process.

- There is a need for policy and regulatory guidance to incorporate hazards, hazard mitigation, and climate change adaptation into existing planning efforts, regulations, policies, and agency practices.

- There is a need to develop or enhance policies to improve shoreline management by limiting shoreline hardening and promoting green infrastructure, habitat restoration, and living shoreline approaches to limit erosion and protect beaches and other at-risk habitats.

- There is a need to improve data collection, management, and analysis to create decision support and communication tools such as hazard modeling, predictive models, and others. There is also a need to make data and related products more widely available to both agency staff and the public.

CZM staff have identified several additional suggestions on how to increase effective management of coastal hazards:

- Enhance CZM permit application considerations and review guidelines to better incorporate hazards and to clarify and increase consistency of various agency permit reviews (especially setbacks, slopes, stormwater management, best management practices (BMP), etc.) Also develop 1) training materials (adapt existing materials into modules and/or booklets) to educate agency staff on requirements (permit processing and review), and 2) certification program(s) for contractors to increase awareness of hazard issues, BMPs, and requirements.

- Establishing or revising buffer zones could complement updated setbacks and lot impervious surface vs. open space requirements to further protect sensitive habitats and reduce impacts from coastal hazards.

- There is a need for development guidance on steep slopes. CZM is experiencing an increase in development applications on highly sloped lots, there is an opportunity to address this gap and create regulatory guidance for such applications.

- Redefine “major” in the context of the CZM permitting structure so that it is not based on project cost or zoning tier, but instead defined by the impact of the project (size, scale, type, etc.). The public could be consulted on desired criteria to include based on what CZM should be looking to control.

- Standardize, make consistent and increase the quality of hazards information required for development permits. This could be done by creating a tool like the Rhode Island Coastal Hazards Application Interactive Worksheet, which serves as a means to notify applicants of potential coastal hazards to consider when planning shoreline development. Hazards include sea level rise (SLR), storm surge and associated flooding, and shoreline erosion. This tool could apply to both major and minor CZM permits to assess future risks to their proposed projects. Another option could be the creation of guidance to require a more thorough analysis of projected rainfall amounts and current and future climate conditions might impact the assessment, hydrology report, and BMP

designs for minor land permits to address coastal hazards (e.g., climate impacts, flooding, erosion, etc.)

- Development of a hazards training and certification program, completion of which would be required for developers and contractors to obtain or renew their professional licenses or could be a continuing education requirement for licensing.

Identification of Priorities:

1. Considering changes in coastal hazard risk and coastal hazard management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to more effectively address the most significant hazard risks. *(Approximately 1-3 sentences per management priority.)*

   Management Priority 1: Revise, update, and enhance regulatory programs to reduce negative impacts from coastal hazards.

   Description: Reduce vulnerability to, and negative impacts from, coastal hazards by more effectively regulating development and redevelopment in hazard prone areas. This can be achieved by several means including developing and enhancing regulations to protect against coastal hazards, creating consistency within the development permitting process, and increasing the consistent application and enforcement of existing coastal development and protection regulations.

   Management Priority 2: Incorporate hazards and climate change risk/vulnerability into existing and proposed development, redevelopment, land use, and related plans.

   Description: Develop policy and regulatory guidance for adaptation that can be incorporated into existing and future planning efforts. There is an opportunity to incorporate hazard adaptation policies, guidance, and other enhanced regulatory material (e.g., revised zoning laws, setbacks, etc.) into the developing Comprehensive Land and Water Use Plan.

   Management Priority 3: Increase awareness of coastal hazards and their risks.

   Description: Develop outreach and communication materials and programs for diverse audiences on what coastal hazards impact the territory, how the community is vulnerable, and what can be done to reduce risk.

   Management Priority 4: Develop and implement programs or projects to restore natural protective habitats and features (e.g., mangroves, wetlands, seagrasses, beaches, coral reefs).

Description: Develop a mitigation bank/fund for the deposit and growth of CZM fines that will fund activities that address coastal hazards (e.g., restoration, nature-based solutions) and to increase resilience.

2. Identify and briefly explain priority needs and information gaps the CMP has for addressing the management priorities identified above. The needs and gaps identified here should not be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	**Need?** (Y or N)	**Brief Explanation of Need/Gap**
Research	Y	Ongoing research into coastal hazards will be needed to improve predictions, best inform management and policy efforts to mitigate them. Research and analysis of regulatory language to establish defensible setback distances. Research into effectiveness of green and natural approaches for shoreline erosion control and rebuilding and replacing at-risk infrastructure. Policy analysis for effectively integrating hazards, climate change, and adaptation into plans, regulations, and policies.
Mapping/GIS/modeling	Y	Ongoing mapping and modeling of hazards and the coastal areas at risk from hazards is needed (e.g., ongoing shoreline erosion and SLR monitoring). Modeling of near shore currents and the creation of sediment budgets for priority areas or hazard/erosion hotspots is also needed.
Data and information management	Y	Collection, maintenance, analysis, and communication of spatial data on coastal hazards is an ongoing need. Additionally, data portals and decision-support tools to make the data more useful for agency staff and accessible to the public are needed.
Training/Capacity building	Y	Training in data collection, maintenance, analysis, and communication for agency staff is needed so that staff can use the data to inform management and policy decisions and to communicate information effectively to the public. Best practices training for agency staff and the public on CZM issues. Required certification program for outside contractors on coastal hazards issues prior to licensing, standardizing, or updating training modules.
Decision-support tools	Y	Predictive models to map impacts of hazards and to inform improved policy and management
Communication and outreach	Y	Communication and outreach materials are needed to inform the public of the results of the CVI, other hazard research, how coastal hazards impact daily life in the territory, how hazards are changing the way DPNR does business, what actions can be taken to mitigate risk and increase community and individual resilience.
Other (specify)		

Enhancement Area Strategy Development:

1. Will the CMP develop one or more strategies for this enhancement area?

   Yes __X__
   No _____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

   The CZM program has decided that §309 funding can be most effectively used to address gaps in the regulatory and permitting processes for development in the coastal zone. Resolving these gaps will lead to increased administrative consistency, increased capacity to reduce impacts from coastal hazards, reduced impacts from hazards on human and natural communities, and set the foundation for CZM and DPNR to manage for hazards more effectively in a changing environment in the future.

Public Access

In-Depth Resource Characterization:

Purpose: To determine key problems and opportunities to improve the CMP's ability to increase and enhance public access opportunities to coastal areas.

1. What are the three most significant existing or emerging threats or stressors to creating or maintaining public access within your coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout the coastal zone or are specific areas most threatened? Stressors can be private development (including conversion of public facilities to private); non-water-dependent commercial or industrial uses of the waterfront; increased demand; erosion; sea level rise; natural disasters; national security; encroachment on public land; or other (please specify). When selecting significant stressors, also consider how climate change may exacerbate each stressor.

	Stressor/Threat	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Stressor 1	Private development	Throughout the coastal zone
Stressor 2	Increased demand	Throughout the coastal zone
Stressor 3	Lack of awareness of laws, regulations, and insufficiency of existing laws related to public access (both locals and off-islanders looking to purchase shoreline properties)	Throughout the coastal zone

2. Briefly explain why these are currently the most significant stressors or threats to public access within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

The USVI's shoreline and beaches are far more than tourist destinations. Territorial beaches are culturally important areas and have served as the USVI's de-facto park system - areas where Crucians, St. Thomians and St. Johnians have historically recreated. Shoreline areas have historically and customarily been used for camping, family gatherings (in many cases with generational ties to specific locations), recreating, and artisanal and subsistence fishing.

Private development (e.g., conversion of existing historic access sites, installation of physical barriers blocking historical access sites, loss of perpendicular access to the coast) and increased demand for access to coastal resources are jeopardizing the public's ability to access the shorelines and have been documented in several sources (as described in the Phase I Assessment) as primary threats to continued equitable public access in the USVI. CZM staff have described an increase in sales of coastal parcels to off-island buyers since the hurricane impacts in 2017, as well as an increase in coastal properties being used as short-term rentals which have resulted in an increase in the number of public access disputes and related incidents. In addition, key stakeholders identified the top two stressors above, as well as non-

water dependent commercial or industrial uses of the waterfront, as those most significant to creating and maintaining public access to USVI coastal resources.

3. Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Emerging Issue	Information Needed
Beach and beach access sustainability (climate impacts, SLR, erosion)	Information about where beaches and access points will be lost and where they are able to be maintained/sustained given predicted changes in conditions as sea level rises due to climate change; sea level rise predictions for public access areas and facilities; erosion data, maps, models for public access areas and facilities; information on adjacent development/ability of beaches to migrate inland and maintain sand supply
Opportunity to identify and secure public access through the shoreline land subdivision approval process.	Legal review of subdivision regulations and options for including or formalizing public access considerations.

In-Depth Management Characterization:

Purpose: To determine the effectiveness of management efforts to address identified problems related to the public access enhancement objective.

1. For each additional public access management category below that was not already discussed as part of the Phase I assessment, indicate if the approach is employed by the state or territory and if significant changes (positive or negative) have occurred at the territory level since the last assessment.

Significant Changes to Public Access Management

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Comprehensive access management planning	N	N/A	N
GIS mapping/database of access sites	Y	N/A	Y
Public access technical assistance, education, and outreach (including access point and interpretive signage, etc.)	Y	N/A	N
Other (please specify)			

2. For management categories with significant changes since the last assessment, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.
    a. Describe significant changes since the last assessment;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

    CZM mapped public access sites and has made an interactive map of sites available on the CZM website. The interactive map was an important, much-needed first step to increase awareness of public access opportunities throughout the territory. However, the accessibility of the map could be improved.

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the territory's management efforts in providing public access since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the territory's management efforts?

    There are few official studies or reports that illustrate the effectiveness of the territory's management efforts to provide public access. However, there are numerous press articles and informal reports of conflicts between property owners and members of the public seeking to exercise their right to the shoreline, which points to deficiencies in current regulatory frameworks and management efforts. From these sources, it is apparent that current development and a lack of understanding of existing laws is causing detrimental impacts to the cultural value that U.S. Virgin Islanders place on their beaches. CZM staff have also identified a gap in public understanding, particularly in those coming from off-island and seeking to purchase shoreline properties, regarding the historic and cultural uses of the shoreline and the intent of the Open Shoreline Act.

    The CZMA noted that important ecological, cultural, historic, and esthetic values in the coastal zone, which are essential to the well-being of all citizens, are being irretrievably damaged or lost. As such, the CZMA made it national policy "to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, **giving full consideration to ecological, cultural, historic, and esthetic values** as well as the needs for compatible economic development." The CZMA calls for CZM programs to provide assistance in the redevelopment of deteriorating urban waterfronts and ports, and **sensitive preservation and restoration of historic, cultural, and esthetic coastal features**. The CZMA required state and territorial programs to include a definition of the term "beach" and a planning process for the protection of, and access to, public beaches and other public coastal areas of environmental, recreational, historical, esthetic, ecological, or cultural value.

Indeed, one of the §309 enhancement objectives is "attaining increased opportunities for public access, **taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value**."

The legislature has noted the problems with public access too, and as referenced in the Phase I Assessment of Public Access, there have been two recent attempts to revise legislation (the Open Shorelines Act and the USVI Coastal Zone Management Act) to address the regulatory deficiencies that are one of the principal issues at the root of the public access challenges in the USVI. However, both attempts failed to proceed through the legislature due to serious legal flaws including property rights and potential liability issues, and no legal definition of "access."

There is a legal review from 2015 (Felix, 2015) that argues how the existing regulations that provide for public access are insufficient and have effectively tied CZM's hands. The author identifies that the Open Shorelines Act codifies the public's right to the shorelines but does not specify how that access will be secured or provided, nor does it include specific consequences or penalties for violating the law, thus complicating its enforcement. The right to public access is implied but not clearly stated. Part of the reason CZM was created is to ensure that the public has the continuous right to use and enjoy shorelines and to maximize public access to do so. Unfortunately, because of poorly written legislation, CZM is limited in its ability to require and enforce access, and therefore in its ability to fulfill its mandate. Felix (2015) outlines several strategies to remedy this issue and increase the public's ability to access the shorelines and CZM's ability to secure and enforce those rights including amending the current Open Shorelines Act with an explicit right to obtain and maintain reasonable shoreline access, clarify CZM's specific legislative authority to enforce the Open Shorelines Act, and establish specific penalties for violations including provisions for repeat offenders. Felix's review also suggests several land use mechanisms that could be employed to preserve the public's beach access rights and avoid conflicts with private property owners such as, the creation of beach parks, historical usage easements, exactions, and/or a government-managed leasing program.

Identification of Priorities:

1. Considering changes in public access and public access management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve the effectiveness of its management effort to better respond to the most significant public access stressors. *(Approximately 1-3 sentences per management priority.)*

   Management Priority 1: Reform public access policy and regulations – improve CZM's ability to designate and enforce equitable public access

   Description: Revise/enhance/amend the Open Shorelines Act and other regulatory language to clarify, augment implementation, and enforcement of policy. Specifically, develop statutory, regulatory, or internal permitting guidance to enhance public access and preserve cultural and

historic shoreline uses: 1) develop legally defensible statutory revisions to the Open Shorelines Act, and 2) revise CZM permit standard conditions to reflect the amended Open Shorelines Act.

Management Priority 2: Address climate change risks to public access due to sea level rise and beach erosion

Description: Evaluate and develop management strategies to protect and enhance coastal resource public access points. Strategies are needed to adapt access ways, parking and other amenities, and recreational shoreline space at risk. Addressing the impact of coastal hazards on public access is important as hazards are predicted to increase in frequency and intensity, and direct and indirect impacts (e.g., beach erosion, shoreline hardening obstructing access points or increasing erosion) will impact future public access. If the territory is moving toward meaningful reform of public access to the coastlines, this would be a good opportunity to include consideration climate change impacts and put policies in place to address them.

Management Priority 3: Plan for continued equitable public access to coastal areas

Description: There is a need to develop a coastal public access management plan/strategy that might include some or all the following components:

- A land acquisition strategy or program to secure, enhance, and maintain public access to and cultural and traditional uses of USVI beaches and shorelines.
- A comprehensive inventory of existing access points.
- A shoreline uses needs/opportunities assessment to collect information on who, what, where, and how many people are using the shoreline. This information could inform additional strategies and efforts to improve public access such as land acquisition, development of a mitigation bank, and communication materials.
- Updated statutory language.
- Information and tools (e.g., geospatial data, apps, brochures, etc.) to increase public awareness of access points including locations, access types, shoreline type, and amenities, as well as allowable uses of those areas (e.g., for camping, etc.).
- A long-term funding mechanism to support creation, improvement, and maintenance of public access, and strategies/incentives for land donations and easements.
- A public education outreach campaign on beach access and customary uses of the beaches for off-islanders and those considering purchasing shoreline properties.

2. Identify and briefly explain priority needs and information gaps the CMP has to help it address the management priorities identified above. The needs and gaps identified here do not need to be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Research	Y	Research and analysis of effective policies to secure equitable public access and enforce public access regulations; research and analysis of land use mechanisms to ensure public access; financing options and administrative processes to acquire, maintain, and improve public access; research on how climate change will impact public access to inform effective management and policy making; public access needs assessment; research into the drivers of the disproportionate loss of public access and barriers to access by socially vulnerable communities
Mapping/GIS	Y	Mapping coastal access points, naming, and enumerating them in a single document or source, and making it publicly available; mapping and modeling of how climate change impacts will impact public access to inform effective management and policy making
Data and information management	Y	Data on shoreline uses, needs, inventory of access sites
Training/Capacity building	Y	There is a need for training and capacity building to understand the challenges with the current regulatory situation with respect to public access, and if regulatory or policy improvements are made there will be a need for additional training; internal training is needed to address the processing of subdivisions in the coastal zone.
Decision-support tools		
Communication and outreach	Y	There is a need to improve the delivery of existing and new material concerning public access regulations, access points, and customary uses of the beaches to the public through websites, digital applications, social media, and traditional print media.
Policy Development	Y	Clarify, improve, and revise Open Shorelines Act and other regulations as needed to secure and enforce access; develop and/or enhance land use policies or mechanisms to ensure public access; include consideration of climate change impacts in relevant coastal access plans and regulations
Planning	Y	Development of a coastal public access management plan/strategy to create and ensure equitable access to the coastlines

Enhancement Area Strategy Development:

1. Will the CMP develop one or more strategies for this enhancement area?

   Yes _____
   No __X____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.
   The CZM program acknowledges that public access and addressing the challenges to creating and ensuring long-term enduring public access to the shoreline are a priority for the territory. A strategy to address public access is not being developed at this time under the §309 program because other program and funding opportunities exist that can be utilized to address some of the identified needs and management priorities (e.g., IIJA, CZM fund, Beach Access fund, etc.).

STRATEGY: Increase Community and Coastal Resource Resilience through Improved Permitting

I. Issue Area(s)

The proposed strategy or implementation activities will support the following high-priority enhancement areas *(check all that apply)*:

☐ Aquaculture
☐ Energy and Government Facility Siting
☒ Coastal Hazards
☐ Ocean/Great Lakes Resources
☐ Special Area Management Planning
☒ Cumulative and Secondary Impacts
☒ Wetlands
☐ Marine Debris
☐ Public Access

II. Strategy Description

A. The proposed strategy will lead to, or implement, the following types of program changes *(check all that apply):*

☐ A change to coastal zone boundaries;

☒ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;

☐ New or revised local coastal programs and implementing ordinances;

☐ New or revised coastal land acquisition, management, and restoration programs;

☐ New or revised special area management plans (SAMP) or plans for areas of particular concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,

☒ New or revised guidelines, procedures, and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government, and other agencies that will result in meaningful improvements in coastal resource management.

B. ***Strategy Goal:***

The goal of this strategy is to support improved and more consistent regulation and management of development within the USVI coastal zone by improving and expanding the permit application and permit review processes to require appropriate coastal setbacks, stormwater management, and BMPs that include consideration of climate change impacts in both Tier 1 and Tier 2 to minimize impacts from coastal hazards and enhance community and ecosystem resilience. The

CZM permit application and permit review guidelines will be reviewed and revised using the most current information on coastal hazard risks. To enhance understanding of the new requirements, new permit review guidance as well as educational and capacity development materials will be created for DPNR agency staff. To enhance compliance with the new requirements, educational materials including trainings to meet new certification requirements will be developed for applicants and contractors based on the updated permit application process, and education and outreach content on coastal hazards will be developed for the public.

C. *Description*: *Describe the proposed strategy and how the strategy will lead to and/or implement the program changes selected above. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)*

This strategy will build upon new and ongoing research into territorial vulnerabilities to coastal hazards (e.g., CVI, HMRP, etc.), inter-agency relationships formed since the 2017 hurricanes, momentum gained by recent efforts to update and revise CZM policies and regulations, and opportunities provided by the cabinet-level support for such efforts by the current DPNR Commissioner. The USVI coastal hazards strategy will increase community and coastal resource resilience by helping the community understand and anticipate risks, reducing future impacts to the built and natural environments, accommodating/adapting to changes in coastal hazards considering the changing climate, and reducing the negative impacts from storms, flooding, and erosion. The strategy has two parts. The first part of the strategy will focus on improving and updating the permitting guidelines, procedures, policy documents, and instrument and its implementation.

(1) Update CZM permit review guidelines to expand permitting/site plan considerations to address coastal hazards:

- Revise the CZM permit application considerations and checklist to include the quantification and consideration of slopes, vegetation types, impervious surfaces, erosion and sediment controls, sea level rise, and other factors to reduce impacts from current and future hazards. Require that consideration of all these factors be incorporated into the site plans and site plan reviews.
- Revise permit setback requirements based on best available science and administrative feasibility.
- Review and clarify the requirements for impervious surfaces vs. open space coverage on lots within certain residential zones.
- Standardize all development permit applications within DPNR (specifically CZM, DEP, and Building Permits) so that earth change activities are managed consistently in both Tier 1 and Tier 2.
- Develop a coastal hazards worksheet to be incorporated into the CZM permit application to ensure consultants, contractors, and applicants are aware of and have considered hazard risks.
- Develop permit review guidelines for agency staff based on the revised CZM permit considerations.

This portion of the strategy will result in revised CZM permit guidelines, procedures, and policy documents formally adopted by DPNR and its partners and provide specific interpretations of enforceable CZM program policies for applicants and other local agencies that will result in meaningful improvements in coastal resource management such as reductions in erosion, sedimentation, and flooding.

The second part of the strategy will focus on providing education, training, and outreach to effectively implement the updated permit process.

(2) Training/Certification to effectively implement revised CZM permit process and address coastal hazards:

(a) Create Training Materials for:

- DPNR and territorial agency staff - develop materials, procedures, assessment tools, and create capacity development opportunities to increase staff capacity to consistently and effectively review CZM applications, conduct permit inspections, and identify and process violations.
- Applicants and their contractors - develop educational materials to assist applicants in completing their CZM applications. Develop training and certification materials on coastal hazards, climate change impacts, BMPs, and other topics for contractors (e.g., heavy-equipment operators, marine and general contractors, architects).
- Public - develop education and outreach materials on coastal hazards in general.

(b) Create a Professional Certification Requirement

(1) New/Updated Professional Certification: develop a training requirement in tandem with DLCA to require contractor and operator participation in DPNR training on the new policies and/or requirements and provide proof of certification to obtain and renew their licenses.

(2) Penalty Provisions:

- Review and revise the violation processes to issue the Notice of Violation (NOVA) and associated monetary penalty(ies) to the contractors in addition to the landowner/applicant.
- Work with DLCA to create a licensing penalty process (e.g., legislative process, an inter-agency agreement or MOU) that would require a contractor to repeat their DPNR certification, or participate in additional/supplemental training, as a penalty for receiving a NOVA (analogous to a certain type or number of driving infractions resulting in having to take a defensive driving course or similar remedial training).

This portion of the strategy will result in program change implementation in the form of outreach, education, and training on the updated policy guidance documents produced. This will include the development of related informational resources and/or presentations to assist staff and partners with implementation of the program changes, to assist applicants and their contractors in

planning for resiliency and managing risk from coastal hazards on their projects and educating members of the public.

Specific products to be developed under this strategy include:

- External and internal policy guidance on CZM permitting to increase resilience to, reduce, and mitigate coastal hazards by incorporating hazard assessment, vegetation management, land use BMPs, and appropriate setbacks.
- Educational resources and tools for applicants and contractors on the need for hazard assessment, and implementation of vegetation management, and land use best management practices to reduce and mitigate hazards in project designs.

III. Needs and Gaps Addressed

Identify what priority needs and gaps the strategy addresses, and explain why the proposed program change or implementation activities are the most appropriate means to address the priority needs and gaps. This discussion should reference the key findings of the assessment and explain how the strategy addresses those findings.

Coastal storms (including coastal flooding, wind damage, and storm surge), flooding (riverine and stormwater), and shoreline erosion were identified as high priorities in the §309 Assessment. These hazards have been identified as responsible for the most significant impacts to the USVI coastal zone and create the most risk for communities, critical built infrastructure, and critical natural infrastructure. Climate change is expected to increase the risk from these hazards and intensify their associated negative impacts. There is a need to incorporate new and enhanced approaches to avoid, minimize, and mitigate coastal and stormwater runoff, flooding, sedimentation, and erosion into the CZM regulatory framework including permitting and policy recommendations, such as clarifying or revising the maximum lot density and percentage of impervious surface vs. open space coverage for certain residential zones. The work outlined in this proposed strategy will build and strengthen CZM policy and management tools available to support implementation of these new approaches, thus protecting coastal resources and the communities that rely upon them.

The Coastal Hazards Assessment identified the need to improve the regulatory framework to address hazards. Such efforts could include developing CZM permit review guidance that incorporate coastal hazards; increasing permit review consistency; evaluating development setbacks; developing guidance on how best to address climate impacts, flooding, sea level rise, erosion; and developing a hazards checklist tool for permit applicants. It also identified training, capacity building, and communication and outreach as priority needs.

The need for improved erosion control and stormwater management to reduce flooding and downstream impacts to coastal resources including wetlands and coral ecosystems was identified in the Wetlands and Cumulative and Secondary Impacts enhancement area Assessments. Both area assessments identified the need to improve enforcement of CZM and land use laws and regulations to protect coastal resources from stressors such as incompatible development, and

stormwater, pollution, and sedimentation caused by upland flooding and erosion. Suggestions included development of CZM permit review guidance, training, and educational materials to increase agency staff awareness and capacity, and to enhance regulatory policies to incorporate climate change adaptation principles.

IV. Benefits to Coastal Management

Discuss the anticipated effect of the strategy, including the scope and value of the strategy, in advancing improvements in the CMP and coastal management, in general.

This strategy addresses a significant territorial need to enhance community and ecosystem resilience to coastal hazards in a time of rising seas, extreme rain events, and more powerful coastal storms. This strategy will result in revised and updated permitting procedures that incorporate the identification, quantification, and careful consideration of factors that influence risk associated with coastal storms, flooding, and erosion, which will reduce community vulnerability and downstream impacts to coastal habitats. Revisions and improvements to the coastal zone development permitting process will potentially improve 20 major and 200 minor CZM projects per year and result in reduced negative impacts to the coastal resources associated with or downstream of these projects. These revisions will also significantly reduce negative impacts from hazards associated with development in Tier 2, by improving development consideration, permitting, and associated outcomes for approximately 2000 projects annually. The accompanying educational and training materials produced will help stakeholders and the wider community to understand and plan for coastal hazards, to calculate risk, and to identify and implement best practices to reduce risk and impacts from storms, flooding, and erosion.

The proposed strategy will also provide administrative benefits by restructuring and unifying the permitting process and communicating cohesive coastal resource management goals to the community. The resulting standardized and consistent permitting process will result in increased transparency, predictability, and accountability for the public. This strategy dovetails with the other initiatives underway at DPNR, most notably the e-permitting system, which is scheduled to be rolled out in the spring of 2023.

V. Likelihood of Success

Discuss the likelihood of attaining the strategy goal and program change (if not part of the strategy goal) during the five-year assessment cycle or at a later date. Address the nature and degree of support for pursuing the strategy and the proposed program change, as well as the specific actions the state or territory will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

The back-to-back hurricanes that impacted the USVI in 2017 dramatically highlighted the need to improve community resilience to coastal hazards. DPNR and its partner territorial agencies recognize this need and as a result there are other efforts underway (as discussed elsewhere in this A&S) to address the risk from coastal hazards. These complementary efforts, the increased

awareness of coastal hazards and their impacts, and the commitment to addressing them has generated the relationships, momentum, and opportunity to achieve the strategy tasks/activities and put the necessary policies in place for successful implementation.

The Commissioner of DPNR has indicated support for the proposed strategy, including referencing some of the strategy's elements in remarks to the legislature. The support and engagement of the Commissioner's office will ensure that the relevant DPNR Divisions are engaged in the development and implementation of the strategy, thereby increasing the likelihood of its success.

There have been recent legislative efforts to revise the CZM regulations, and the CZM Commission has made some modifications to policies. CZM and its Commission are ready to move forward with additional updates to better address coastal hazards and their impacts to the USVI.

CZM and its partner Divisions within DPNR have established relationships that will be leveraged to implement the portions of the strategy that require development of deliverables. CZM Permitting staff will take the lead on coordinating implementation of the strategy work plan. CZM anticipates hiring a contractor to complete the technical work and to develop the various elements identified in the strategy (e.g., conduct research, draft language for policy and guidance materials, develop technical and educational materials). As part of the research phase of the strategy CZM will leverage its relationship as part of the Coastal States Organization to identify, review, and adapt, if appropriate, similar efforts in progress or practice in other states or territories (e.g., state certification programs). Hiring a contractor to execute the technical work will allow them to focus solely on developing the necessary deliverables to implement the strategy and program change. Internally, the Divisions have experienced personnel that will provide input to the contractor to ensure that the products are relevant, realistic, and implementable.

The scope of the strategy is within CZM's own authority and realm of influence and will not require significant buy-in from numerous additional government agencies to develop or implement. Also, there are existing educational and training materials that can be updated rather than requiring the development of entirely new educational content for the purposes of this strategy.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps that will lead toward or achieve a program change or implement a previously achieved program change.

Strategy Goal: Reduce negative impacts from coastal hazards and increase community resilience through improved permitting

Total Years: 3

Total Budget: $240,000

Year 1 - 2

Description of activities: Activities during years one and two will focus on the review and revision of CZM permit considerations and permit review guidelines to address coastal hazards. Activities will include the following:

- Hire a consultant to lead the technical work

- Establish an ad-hoc DPNR permitting advisory group to collaborate with and advise the consultant

- Review and revise permit application considerations
    - Conduct a needs assessment to identify which permit application elements need revision
    - Identify the process for legal adoption of revised permit considerations
    - Review existing information (e.g., CVI, HMRP, Environmental Handbook, etc.) and conduct a gap analysis for information needed to revise permit applications
    - Develop the data and information for the legally defensible rationale and specific permit requirements to address application considerations affecting hazard risk
    - Evaluate and develop best practices and guidance for hazards and considerations to be included in permit applications:
        - Stormwater management and control
        - Erosion and sediment controls
        - Slopes
        - Coastal flooding/storm surge
        - Setbacks
    - Review the maximum percentage of impervious surface coverage for lots within certain residential zones and develop language to clarify requirements
    - Document the rationale for the hazard factors and considerations that will be addressed in the permitting and site planning processes
    - Develop a coastal hazards awareness tool for permit applicants

- Standardize DPNR development permit applications
    - Identify the permitting processes that need to be standardized
    - Identify the process for legal adoption of the revised permits
    - Communicate the permit revisions and justification within DPNR
    - Develop agency guidance on revised permit application guidelines
    - Prepare for adoption and implementation of standardized permit review guidelines

Major Milestone(s):

- Draft policy, statutory, regulatory, and agency guidance language for revised CZM permit guidelines, procedures, and policy documents.
- Draft updated setback policy and guidance.
- Clear lot density and coverage requirements for certain residential zones.

- Updated and consistent erosion, sediment, and stormwater management requirements and BMPs for Tier 1 and Tier 2 sites and for areas in steep slopes.
- Draft policy, BMPs, and guidelines to reduce and mitigate impacts from coastal flooding.
- Coastal hazards awareness tool for applicants.
- Permit review guidance for DPNR staff.

Budget: $160,000

Year 3

Description of activities: Activities in year three will focus on providing education, training, and outreach to effectively implement the updated permit process. Activities will include:

- Develop educational, training, and certification materials to support effective implementation of revised permit conditions and address coastal hazards
    - Develop educational materials for DPNR and agency staff
    - Increase agency capacity to implement new permit guidelines by identifying capacity needs and creating development opportunities
    - Develop educational materials for applicants and contractors
    - Develop materials to support applicants
    - Develop training and certification materials for contractors
    - Develop educational materials for the public
    - Develop roll-out and distribution strategies for the new educational and training materials
- Create a professional certification requirement for contractors working on CZM development projects
    - Develop a new or updated professional certification in collaboration with DLCA
    - Create an ad-hoc project advisory group to advise on the creation of the certification requirement and program
    - Assess needs by reviewing current requirements and identifying new requirements
    - Develop a training program with a proposed implementation schedule
    - Formalize changes in the certification program with DLCA
    - Identify requirements for adoption and implementation of the professional certification requirement
    - Review existing, revise, and/or develop new penalty provisions as needed to accompany the updates professional certification and licensure requirements
    - Develop a roll-out strategy for the new licensure requirements

Major Milestone(s):

- Summary of identified training and capacity needs for DPNR permitting staff.
- Educational material on addressing coastal hazards and the updated CZM permitting process for multiple audiences.
- Draft professional certification program for CZM development contractors.
- Draft updated violation and penalty provisions.

Budget: $80,000

VII. Fiscal and Technical Needs

A. Fiscal Needs: If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the CMP has made, if any, to secure additional state funds from the legislature and/or from other sources to support this strategy.

CZM anticipates that §309 funding will be sufficient to complete the proposed strategy. CZM will explore opportunities such partnerships with UVI, VITEMA, or other agencies, or other potential funding sources (e.g., Coral Management program, other CZM funding streams) to contribute to the successful completion of this strategy. If additional support and/or funds were secured, the strategy could potentially be completed in less time.

B. Technical Needs: If the state does not possess the technical knowledge, skills, or equipment to carry out all or part of the proposed strategy, identify these needs. Provide a brief description of what efforts the CMP has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).

The technical and human capacities to implement this strategy do not currently exist within the USVI CZM program. CZM will be seeking to hire a professional consultant(s) with the necessary background in coastal zone permitting, land use planning, policy development, and/or watershed management/engineering experience to conduct the research and development tasks associated with this strategy. CZM is currently exploring the possibility of engaging legal or coastal zone fellows for specific strategy sub-tasks (e.g., development of policy and guidance for slopes, setbacks, etc.) to complement the work of the hired consultant. CZM will also seek support from OCM and CSO to identify other coastal programs with similar issues (setbacks, slopes) or programs (certification requirements) as resources, and/or to facilitate information sharing meetings or workshops.

VIII. Projects of Special Merit (Optional)

If desired, briefly state what projects of special merit the CMP may wish to pursue to augment this strategy. (Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above.) The information in this section will not be used to evaluate or rank projects of special merit and is simply meant to give CMPs the option to provide additional information if they choose. Project descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not provide detailed project descriptions that would be needed for the funding competition.

- Identify and incorporate additional layers for the USVI e-permit system and incorporate the same layers into the USVI GIS public property viewer (e.g., coastal flood exposure mapper, sea level rise viewer, etc.)
- Creation of a tool to support DPNR and DLCA in tracking compliance with the training and licensing requirement
- Creation of a tool to track notices of violation (e.g., CNMI public GIS-based violation app)

IX. 3-Year Budget Summary by Strategy

Strategy Title	Anticipated Funding Source (§309 or Other)	Year 1 Funding	Year 2 Funding	Year 3 Funding	Total Funding
Increase Community and Coastal Resource Resilience through Improved Permitting	CZM §309 Funds	$80,000	$80,000	$80,000	$240,000
TOTAL		**$80,000**	**$80,000**	**$80,000**	**$240,000**

The USVI CZM program will use its anticipated §309 formula allocation for each of the three years as described in the strategy work plan. CZM will explore opportunities such partnerships or other potential funding sources to contribute to the successful completion of this strategy. If additional support and/or funds were secured, the strategy could potentially be completed in less time.

STAKEHOLDER ENGAGEMENT AND PUBLIC COMMENT

Stakeholder Engagement

The USVI CZM program solicited input for the §309 Enhancement Program Assessment from its network of project partners and subject matter experts that frequently work with the program. These entities represent territorial and federal government agencies, non-governmental organizations, academia, and the private sector. CZM reached out to the following agencies/organizations for input:

- V.I. Department of Public Works
- V.I. Department of Sports, Parks, and Recreation
- V.I. DPNR, Division of Coastal Zone Management
- V.I. DPNR, CZM St. Croix East End Marine Park
- V.I. DPNR, Division of Fish and Wildlife
- V.I. Energy Office
- V.I. Water and Power Authority
- V.I. Commission on Aquaculture and Mariculture
- NOAA
- USDA Natural Resource Conservation Service
- BioImpact, Inc.
- Environmental Support Services, LLC.
- Geographic Consulting
- Horsley Witten Group, Inc.
- Island Designs
- Tysam Tech
- Watershed Consulting
- University of the Virgin Islands

Stakeholders provided feedback on what they felt are the high priority enhancement areas, the relative significance of threats or impacts to them, and the greatest opportunities for CZM to strengthen and enhance them more effectively. This ensured that the priorities and needs proposed in the assessment and strategy reflect more than just the opinions of CZM staff. A summary of stakeholder feedback received is provided in Appendix I.

Public Comment

The National CZMA places a strong emphasis on public participation and encourages the participation, coordination, and cooperation with and among appropriate local, state, federal, and regional groups to help achieve the goals of the CZMA. In keeping with the intent of the CZMA, the A&S is a public document. During the timeframe concurrent with NOAA review of the draft A&S, the USVI CZM program initiated the 30-day public comment period by posting a digital copy of the draft A&S on its public website and by providing hard copies of the draft document in CZM offices and libraries. The public was provided the opportunity to review the draft document and submit comments to CZM. A summary of public feedback on the draft A&S is provided in Appendix II.

REFERENCES

Business Research and Economic Advisors. (2012). *Economic Contribution of Cruise Tourism to the Destination Economies - A Survey-based Analysis of the Impacts of Passeger, Crew, and Cruise Line Spending.*

Clements, J., Feliciano, V., Almodovar-Caraballo, B., & Colgan, C. (2016). *Describing the Ocean Economies of the U.S. Virgin Islands and Puerto Rico.* Charleston, SC: NOAA Office of Coastal Management.

Conservation Data Center. (2010). *Wetlands of the U.S. Virgin Islands.* USVI: Division of Environmental Protection, Department of Planning and Natural Resources.

Coral Bay Community Council. (2017). *Vegetation for Erosion Control - A Manual for Residents.* Coral Bay Community Council.

Coral Reef Conservation Program. (2018). *Coral Reef Conservation Program Strategic Plan.* Silver Spring, MD: National Oceanic and Atmospheric Administration.

Coral Reef Conservation Program. (2020). *Coral reef condition: A status report for the U.S. Virgin Islands 2020.* National Oceanic and Atmospheric Administration.

Diaz, E., Cerezo, C., Amador, M., Dragoni, A., Pages, F., Rodriguez, M., . . . Rolli, C. (2021). *Strategic Implementation Plan for Catalyzing a Blue Economy for the US Caribbean.* Tetra Tech.

Division of Building Permits. (2020). *Floodplain Management in the U.S. Virgin Islands Quick Guide.* V.I. Department of Planning and Natural Resources.

Division of Coastal Zone Management. (2020). *Climate Change Preparedness Self Assessment.* V.I. Department of Planning and Natural Resources.

Dobson, J., Johnson, I., Rhodes, K., Lussier, B., & Byler, K. (2020). *U.S. Virgin Islands Coastal Resilience Assessment.* Asheville, NC: UNC Asheville National Environmental Modeling and Analysis Center.

Edwards, K., Blondeau, J., Grove, L., Groves, S., Hile, S., Johnson, M., . . . Williams, B. (2021). *National Coral Reef Monitoring Program, Biological Monitoring Summary - U.S. Virgin Islands and Puerto Rico: 2019.* National Oceanic and Atmospheric Administration. doi:10.25923/fdp6-qv15

Ennis, R., Kadison, E., Heidmann, S., Brandt, M., Henderson, L., & Smith, T. (2019). The United States Virgin Islands Territorial Coral Reef Monitoring Program: 2019 Annual Report. 295.

Ennis, R., Kadison, E., Heidmann, S., Brandt, M., Henderson, L., & Smith, T. (DRAFT). *The United States Virgin Islands Territorial Coral Reef Monitoring Program: 2021 Annual Report DRAFT.*

Environmental Support Services. (2010). *Framework for Management of Wetlands in the U.S. Virgin Islands.* Division of Environmental Planning, Department of Planning and Natural Resources.

Felix, A. (2015). "Take Back the Beach!" An Analysis of the Need for Enforcement of Beach Access Rights for U.S. VIrgin Islanders. *Florida A&M University Law Review, 10*(2), 29.

Gould, W., Diaz, E., Alvarez-Berrios, N., Aponte-Gonzalez, F., Archibald, W., Bowden, J., . . . Torres-Gonzalez, S. (2018). 2018: U.S. Caribbean. In D. Reidmiller, C. Avery, D. Easterling, K. Kunkel, K. Lewis, T. Maycock, & B. Stewart (Eds.), *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* (pp. 809-871). Washington, DC: U.S. Global Change Research Program. doi:10.7930/NCA4.2018.CH20

Guannel, G., Beck, N., Bove, G., Buchanan, J., & Hamlin, T. (2022a). *Shoreline Characterization and Coastal Vulnerability Index for the U.S. Virgin Islands.* University of the Virgin Islands Caribbean Green Technology Center.

Guannel, G., Lohman, H., & Dwyer, J. (2022b). *The Public Health Implications of Social Vulnerability in the U.S. Virgin Islands.* Boulder, CO: Natural Hazards Center, University of Colorado Boulder.

Henderson, L., Blondeau, J., Taylor, M., Nemeth, R., & Smith, T. (resubmitting). Terrestrial and Silt-Clay Sediment Flux Affect Stony Coral Health in the Nearshore U.S. Virgin Islands. *PLoS ONE*.

Kadison, E., Brandt, M., Nemeth, R., Martens, J., Blondeau, J., & Smith, T. (2017). Abundance of commercially important reef fish indicates different levels of over-exploitation across shelves of the U.S. Virgin Islands. *PLoS ONE*.

(2018). *Keeping Our Coastlines Clean A U.S. Virgin Islands Marine Debris Curriculum.*

Keller, J., Grimes, K. W., Reeve, A., & Platenburg, R. (2017). Mangroves buffer marine protected area from impacts of Bovoni landfill, St. Thomas, United States Virgin Islands. *Wetlands Ecology and Management, 25*(1), 536-582.

Kitchell, A., Kuchar, B., & Viquieria Rios, R. (2021). *Unpaved Road Standards for Caribbean and Pacific Islands.* NOAA Restoration Center and Coral Reef Conservation Program.

Meiling, S., Henderson, L., Townsend, J., & Brandt, M. (2020). *Coral Disease Outbreak Response Plan for the United States Virgin Islands.* St. Thomas, USVI: University of the Virgin Islands.

National Fish and Wildlife Foundation. (2017). *Coral Watershed Assessment Tool: Decision support for prioritizing threats and restoration actions.* National Fish and Wildlife Foundation.

NOAA Coral Reef Conservation Program. (2014). *Stormwater Management in Pacific and Caribbean Islands: A Practitioner's Guide to Implementing LID.* National Oceanic and Atmospheric Administration.

NOAA Fisheries. (2016). *2016 Report to Congress on the Status of U.S. Fisheries.* National Oceanic and Atmospheric Administration.

NOAA Marine Debris Program. (2021). *U.S. Virgin Islands Marine Debris Emergency Response Guide: Comprehensive Guidance Document.* National Oceanic and Atmospheric Administration.

NOAA Office for Coastal Management. (2018). *Final Evaluation Findings: U.S. Virgin Islands Coastal Management Program.* National Oceanic and Atmospheric Administration.

Olinger, L., Heidmann, S., Durdall, A., Howe, C., Ramseyer, T., Thomas, S., . . . Brandt, M. (2017). Altered juvenile fish communities associated with invasive Halophila stipulacea seagrass habitats in the U.S. Virgin Islands. *PloS ONE, 12*.

Penn, A. (2022, March 30). Two Big STX Port Projects to be Finished This Year, Port Authority Head Tells Senators. *St. Thomas Source*. Retrieved from https://stthomassource.com/content/2022/03/30/two-big-stx-port-projects-to-be-finished-this-year-port-authority-head-tells-senators/

Ramos-Scharron, C., & Figueroa-Sanchez, Y. (2017). Plot-, farm-, and watershed-scale effects of coffee cultivation in runoff and sediment production in western Puerto Rico. *Journal of Environmental Management, 202*, 126-136.

Ramos-Scharron, C., & MacDonald, L. (2007). Measurement and prediction of natural and anthropogenic sediment sources, St. John, U.S. Virgin Islands. *Catena, 71*, 250-266.

Ramos-Scharron, C., Amador-Gutierrez, J., & Hernandez-Delgado, E. (2012). An interdisciplinary erosion mitigation approach for coral reef protection-a case study from the Eastern Caribbean. *Marine Ecosystems*, 127-160.

Rogers, C., & Ramos-Scharron, C. (2022). Assessing Effects of Sediment Delivery to Coral Reefs: A Caribbean Watershed Perspective. *Frontiers in Marine Science*.

Rothenberger, J., & Henderson, L. (Eds.). (2019). United States Virgin Islands' Coral Reef Management Priorities: 2020-2025. *V.I. Department of Planning and Natural Resources Division of Coastal Zone Management*.

Smith, T., Nemeth, R., Blondeau, J., Calnan, J., Kadison, E., & Herzlieb, S. (2008). Assessing Coral Reef Health Across Onshore to Offshore Stress Gradients in the U.S. Virgin Islands. *Marine Pollution Bulletin, 56*, 9.

The U.S. Coral Reef Task Force. (2016). *U.S. Coral Reef Task Force Handbook on Coral Reef Impacts: Avoidance, Minimization, Compensatory Mitigation, and Restoration.* Washington, D.C.

Tuttle, L., & Donahue, M. (2022). Effects of Sediment Exposure on Corals: A Systematic Review of Experimental Studies. *Environmental Evidence*, 33.

U.S. Army Corps of Engineers. (2022). *South Atlantic Coastal Study (SACS) U.S. Virgin Islands Appendix.*

U.S. Census Bureau. (2020). *2020 Island Areas Censuses: U.S. Virgin Islands.* Retrieved from https://www.census.gov/programs-surveys/decennial-census/decade/2020/planning-management/release/2020-island-areas-data-products.html

U.S. Department of Agriculture. (2020). *2017 Census of Agriculture Virgin Islands of the United States (2018) Territory and Island Data Volume 1.* U.S. Department of Agriculture.

University of the Virgin Islands. (2021). *United States Virgin Islands Marine Debris Action Plan 2021-2026.* University of the Virgin Islands.

USVI Hurricane Recovery and Resilience Task Force. (2018). *USVI Hurricane Recovery and Resilience Task Force Draft Report.*

USVI Office of Disaster Recovery. (2019). *2019 Territorial Hazard Mitigation Plan.*

USVI Office of the Governor/Office of Disaster Recovery. (2019). *USVI Hurricanes Irma and Maria Recovery Progress Report.* Government of the United States Virgin Islands.

van Beukering, P., Brander, L., van Zanten, B., Verbrugge, E., & Lems, K. (2011). *The Economic Value of the Coral Reef Ecosystems of the United States Virgin Islands.* IVM Institute for Environmental Studies.

Virgin Islands Housing Finance Authority. (2019). *United States Virgin Islands Disaster Recovery Action Plan.*

Virgin Islands Water and Power Authority. (2020). *Virgin Islands Water and Power Authority Strategic Transformation Plan - Reliable, clean, and affordable energy for the U.S.V.I.* VI Water and Power Authority.

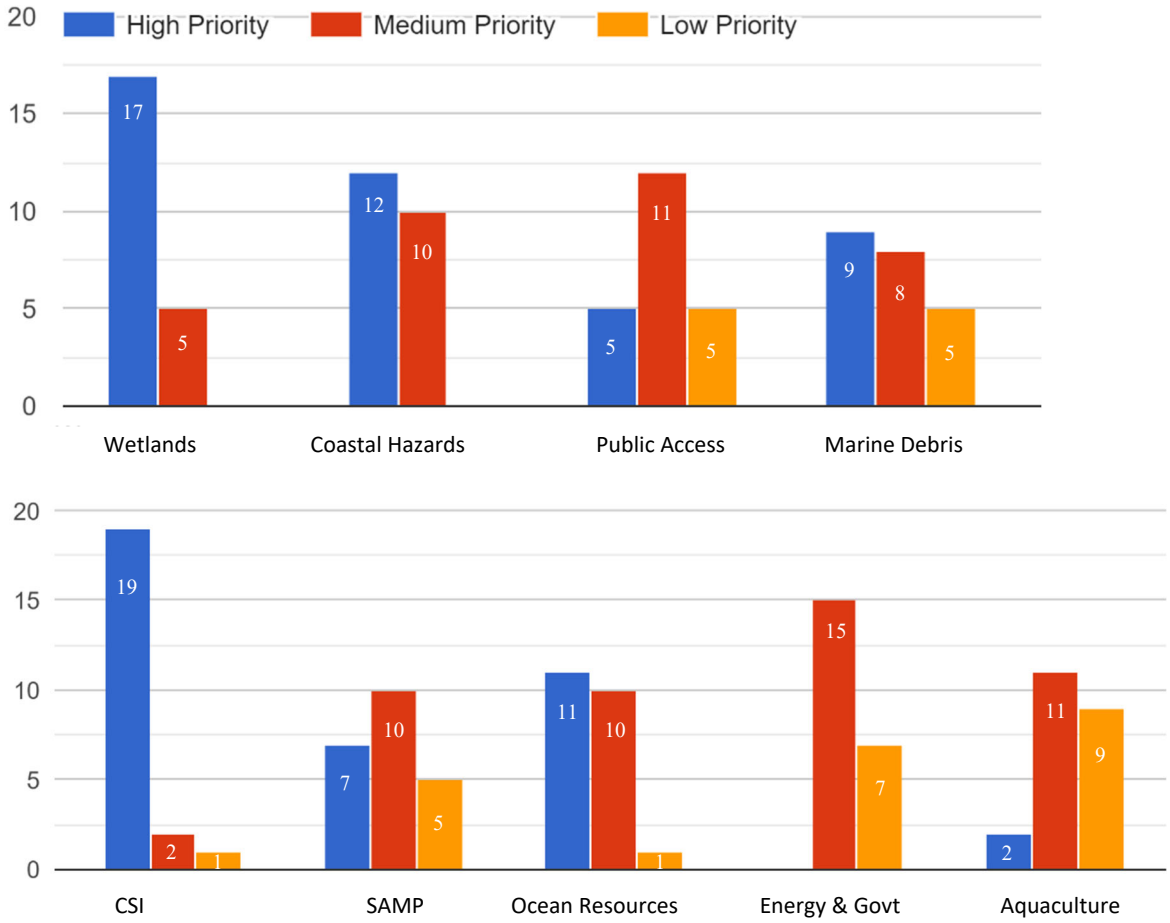
APPENDIX I – SUMMARY OF KEY STAKEHOLDER QUESTIONNAIRE

Key stakeholder feedback was solicited via questionnaire at the beginning of the Phase I Assessment. The CZM core team identified and engaged twenty-four key stakeholders representing subject matter experts and project partners from a range of organizations including federal and territorial government, non-governmental, academia, and private/commercial industry. Twenty-two (22) responses were received. The questionnaire was designed to obtain input on the relative priorities of the nine CZM enhancement areas, the relative significance of threats or impacts to them, and to identify priority management needs and opportunities for CZM to effectively address them.

The questions presented to the key stakeholders and their responses are summarized below. Numbers included within the bars on the various charts indicate the number of responses received for that category.

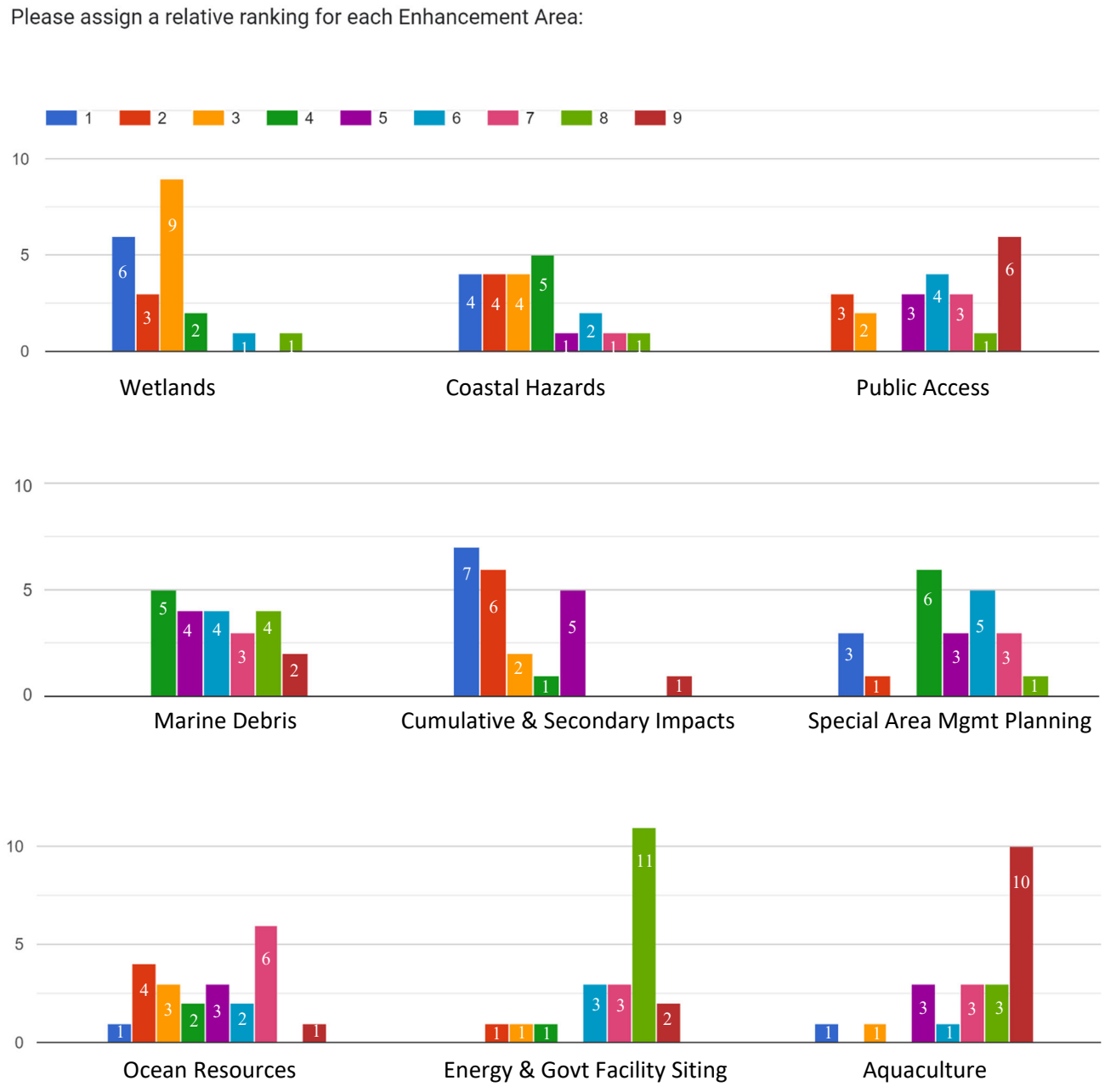
The first two questions presented to stakeholders included all nine CZM enhancement areas, and asked for input on their relative prioritization:

Please give a High, Medium or Low Priority to each of the following Enhancement Areas:



The top three enhancement areas given a priority rank of “high” were Cumulative and Secondary Impacts (19 respondents ranked it high priority), Wetlands (17 respondents ranked it high priority), and Coastal Hazards (12 respondents ranked it high priority). Ocean Resources was ranked fourth in priority with 11 votes.

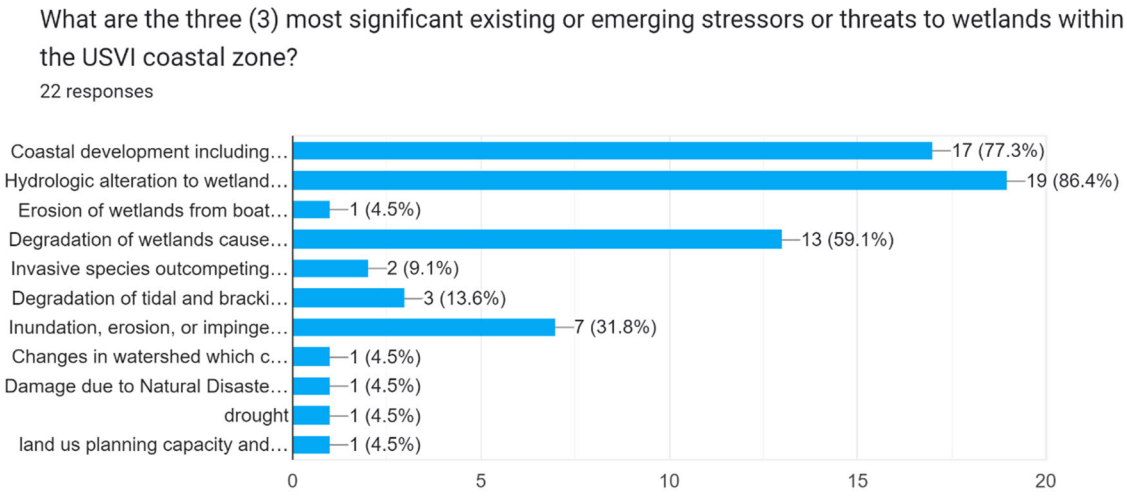
Respondents were then asked to rank the nine enhancement areas from #1 to #9, where #1 is the highest priority enhancement area and #9 is the lowest priority enhancement area. Each number/rank could only be used once.



The top three enhancement areas ranked as most important (were Cumulative and Secondary Impacts (seven votes), Wetlands (six votes), and Coastal Hazards (four votes). Respondents ranked Special Area Management Planning as the fourth most important enhancement area with three votes.

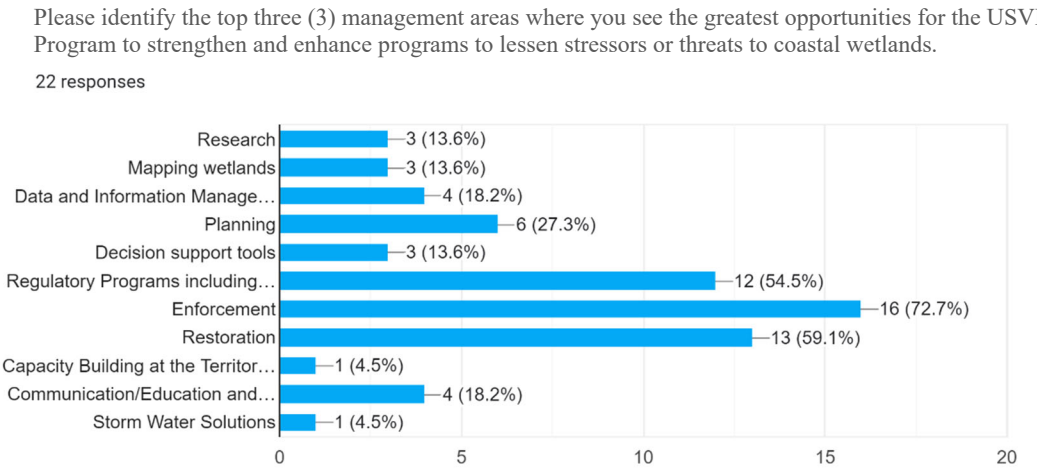
Key stakeholders were also asked a series of questions relating to each of the nine enhancement areas to provide input on the stressors and threats within the USVI coastal zone and on management needs and opportunities. The questions posed to the stakeholders and summaries of their responses are listed below by enhancement area:

WETLANDS



The three most significant existing or emerging stressors or threats to wetlands identified by the key stakeholders were:

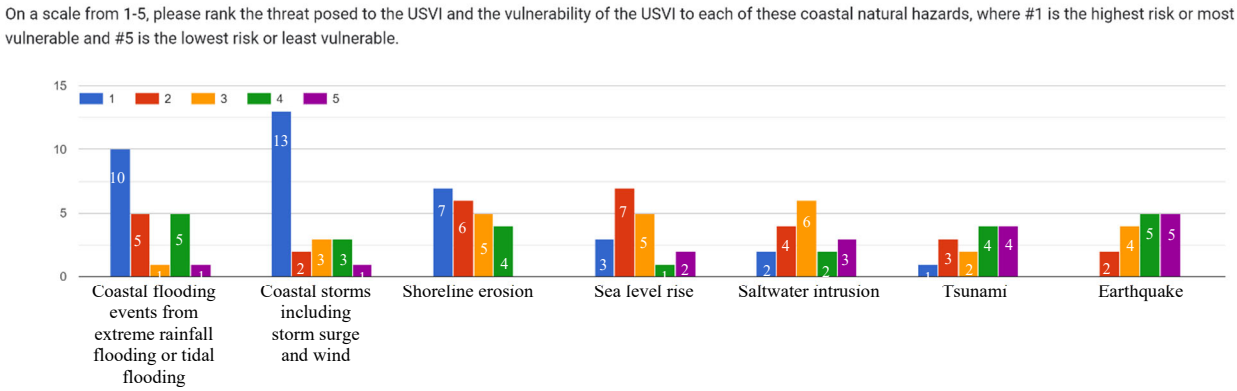
1. Hydrologic alteration to wetlands (significant changes in the magnitude, duration, timing, frequency, or rate of change of natural stream flows or salinity levels)
2. Coastal development including filling or excavating wetlands for coastal structures
3. Degradation of wetlands caused by pollution



The top three management needs and opportunities to lessen threats to wetlands identified by the key stakeholders were:

1. Enforcement
2. Restoration
3. Regulatory programs including policies, ordinances, etc.

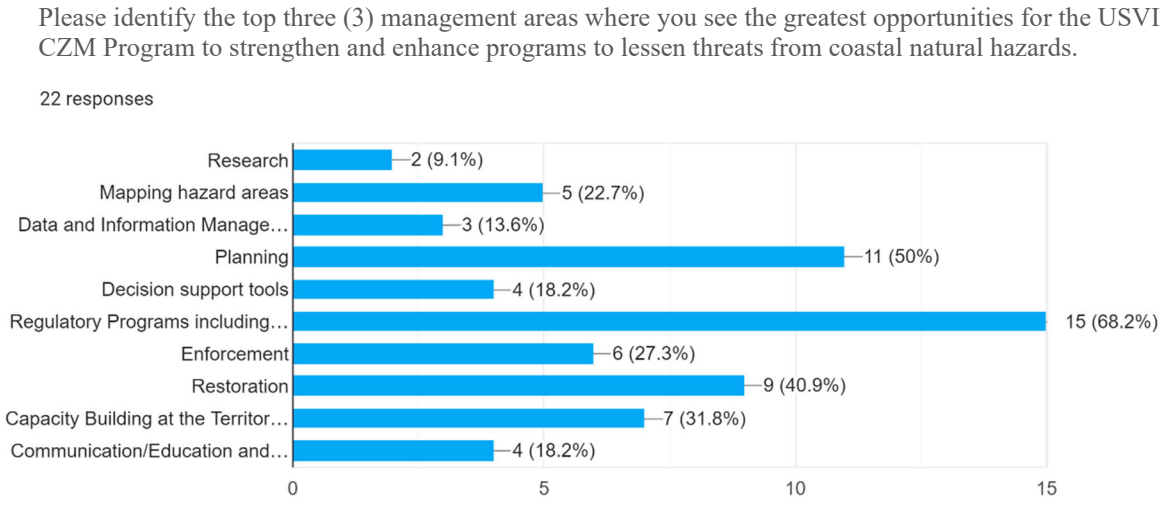
COASTAL HAZARDS



The three coastal natural hazards identified as presenting the greatest risk to the USVI were 1) coastal storms, 2) coastal flooding events, and 3) shoreline erosion.

Key stakeholders identified the following six additional natural coastal hazard threats, but they were not ranked:

- Loss of protective reef structures offshore
- Degradation of public land
- Loss of natural barriers, such as coral reefs and mangroves
- Terrestrial runoff from development in second tier
- Coastal development creates vulnerability and alters processes
- Damage to natural shoreline buffers like mangrove, seagrass, and coral reefs

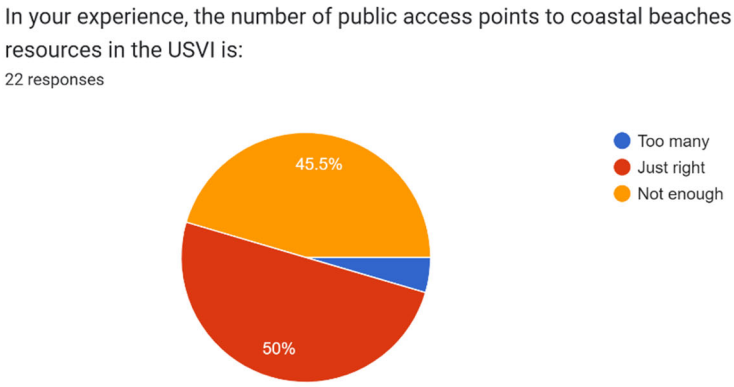


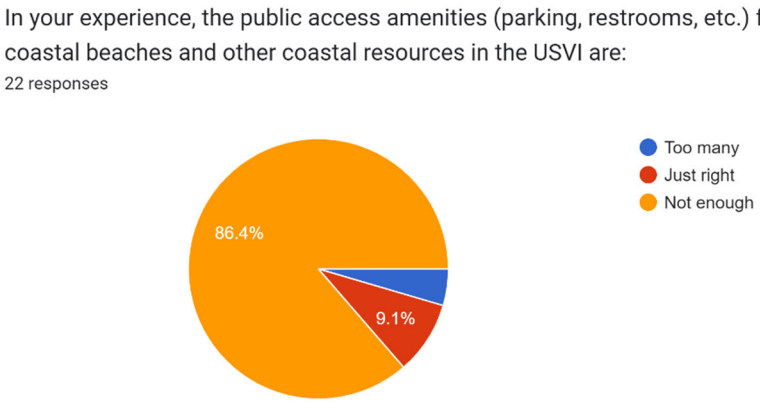
The top three management needs and opportunities to lessen threats from coastal hazards identified by the key stakeholders were:

1. Regulatory programs including policies, ordinances, etc.
2. Planning
3. Restoration

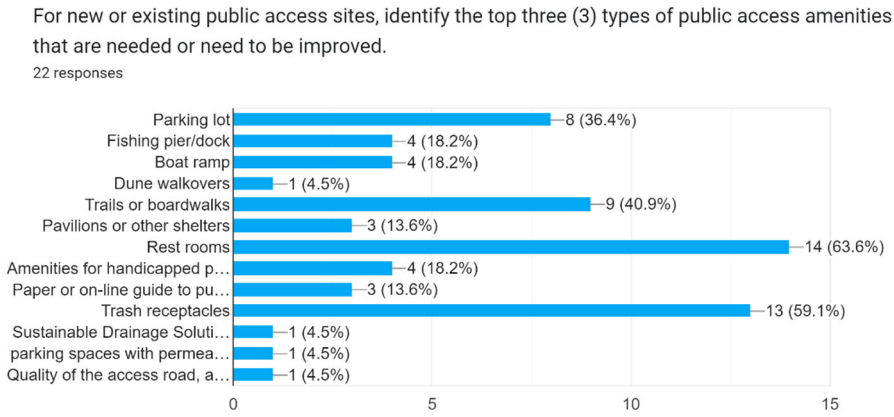
PUBLIC ACCESS

Key stakeholders were asked for their feedback on the number and quality of public access points to coastal resources in the USVI. Stakeholders were also asked how public access amenities could be improved.



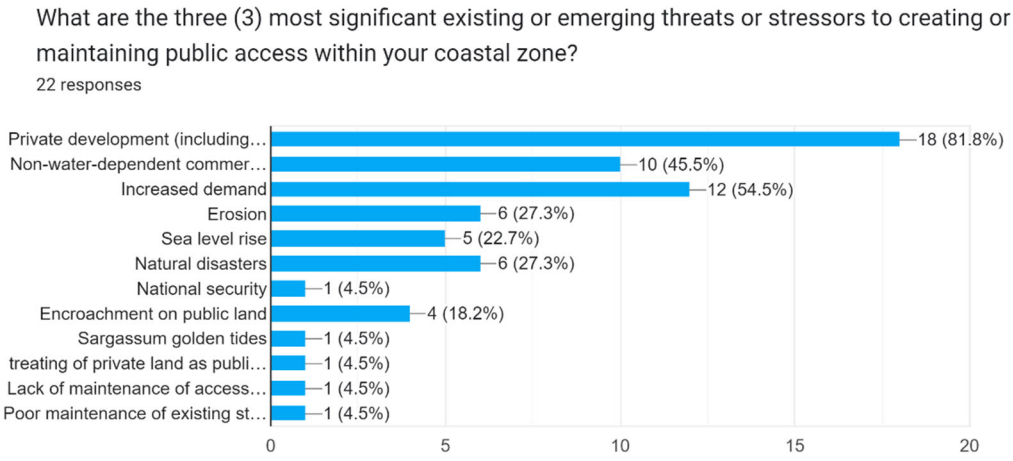


The respondents were approximately evenly split as to whether there was a need for more public access points, however most of them agreed that amenities at existing public access sites were inadequate. Respondents also provided input on what types of amenities are needed to improve public access sites.



Stakeholders indicated that trash receptacles, rest rooms, and trails or boardwalks are the amenities that would most improve public access to USVI coastal resources.

Key stakeholders were also asked about the threats or stressors to creating and maintaining public access in the USVI.

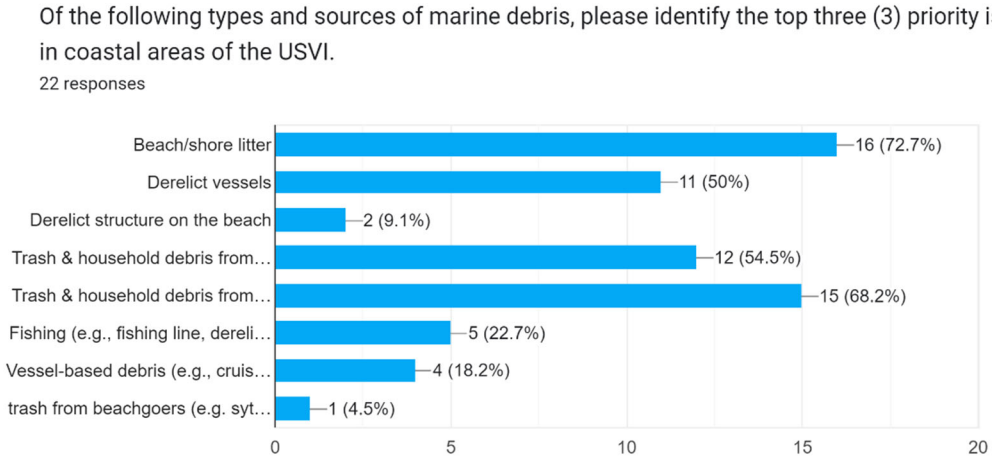


Stakeholders indicated that the three most significant threats or stressors to maintaining public access are:

1. Private development (including conversion of public facilities to private)
2. Increased demand
3. Non-water-dependent commercial or industrial uses of the waterfront

MARINE DEBRIS

Key stakeholders were asked to identify the top types and sources of marine debris impacting coastal resources in the USVI.



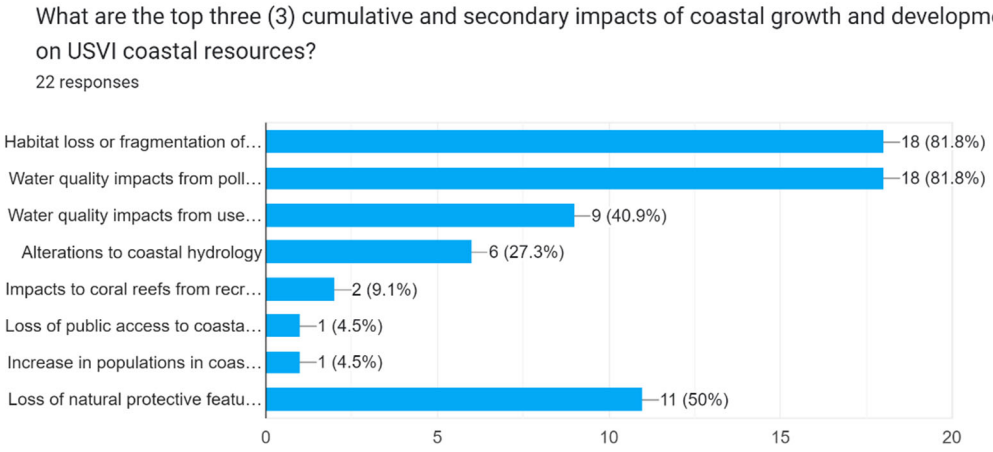
Stakeholders indicated that the top three types and sources of marine debris that pose the biggest threat to resources are all from the land-based sources:

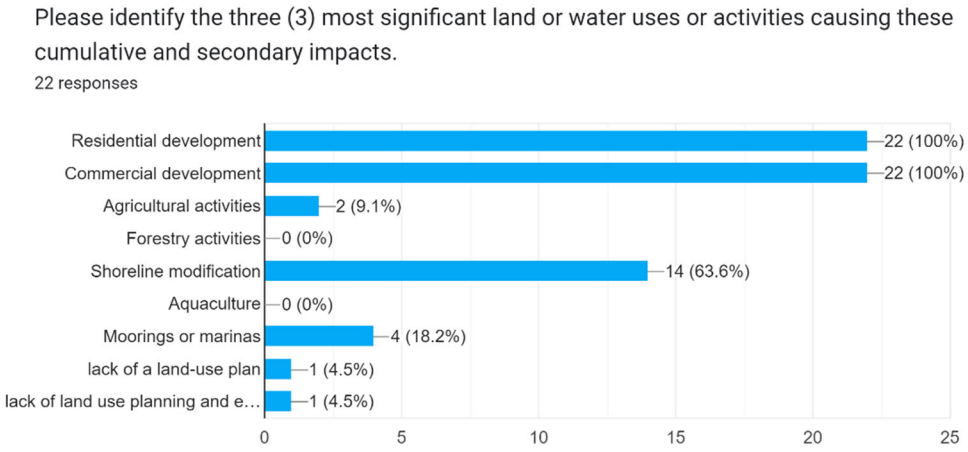
1. Beach and shore litter
2. Trash and household debris from storm drains and runoff
3. Trash and household debris from dumping (count of 12)

The fourth priority source of marine debris identified by the stakeholders that is problematic in the USVI coastal zone is derelict vessels (count of 11).

CUMULATIVE AND SECONDARY IMPACTS

Key stakeholders were asked to identify the top cumulative and secondary impacts associated with coastal development as well as the top land or water uses and activities that cause these impacts.





Stakeholders indicated that the top three impacts of coastal growth and development on territorial coastal resources are:

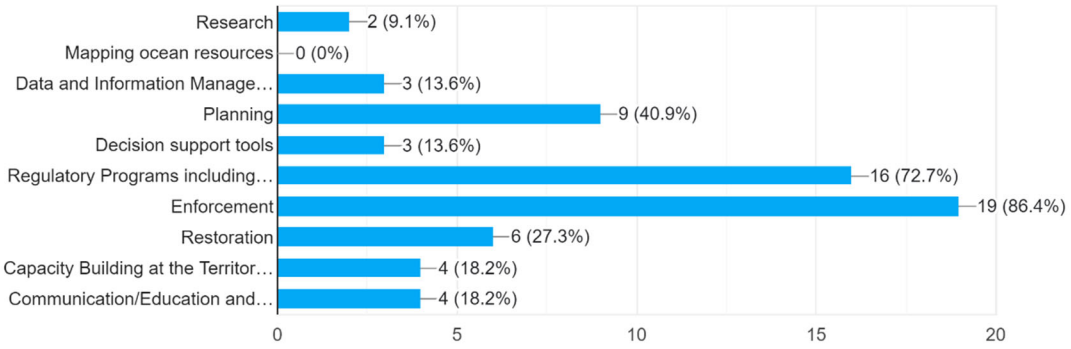
1a. Habitat loss or fragmentation of habitat from development
1b. Water quality impacts from polluted or sediment-laden runoff resulting in habitat degradation or loss (e.g., corals, wetlands, etc.)
3. Water quality impacts from use of septic systems

Stakeholders also indicated that the most significant source of these cumulative and secondary impacts are associated with land development.

1a. Residential development
1b. Commercial development
3. Shoreline modification

Please identify the top three (3) management areas where you see the greatest opportunities for the USVI CZM Program to strengthen and enhance programs to improve management of cumulative and secondary impacts.

22 responses



Stakeholders indicated that the top management areas where there were opportunities for CZM to strengthen efforts to improve the management of cumulative and secondary impacts were:

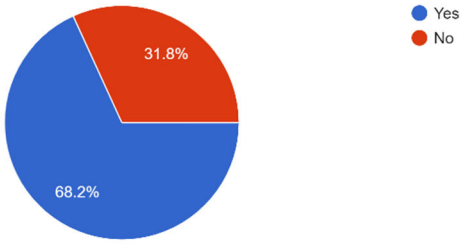
1. Enforcement
2. Regulatory programs including policies, ordinances, etc.
3. Planning

SPECIAL AREA MANAGEMENT PLANNING

Key stakeholders were asked to provide input on whether there are specific geographies within the territory that need additional management effort to improve resource protection or to reduce conflicts.

Are there any specific geographic areas in the USVI coastal zone that need additional planning, policy development, and/or management to improve resource protection or reduce use conflicts?

22 responses

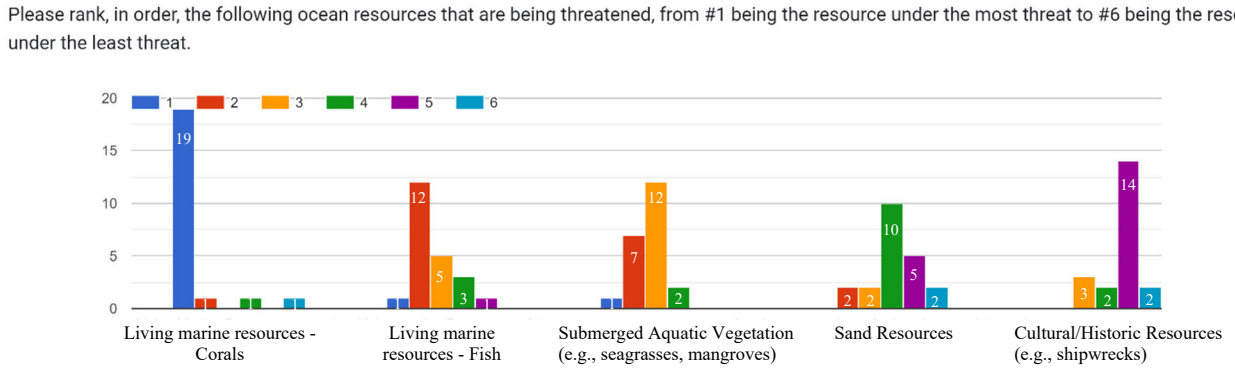


A number of geographic areas were listed as needing additional planning, policy, or management efforts including:

- Cays
- Offshore environment (coastal salt ponds, wetlands, remaining forest, coastal waters)
- Specific areas around each of the main islands
- Undeveloped lands were identified as needing a special plan to limit future development impacts
- Coastal setbacks

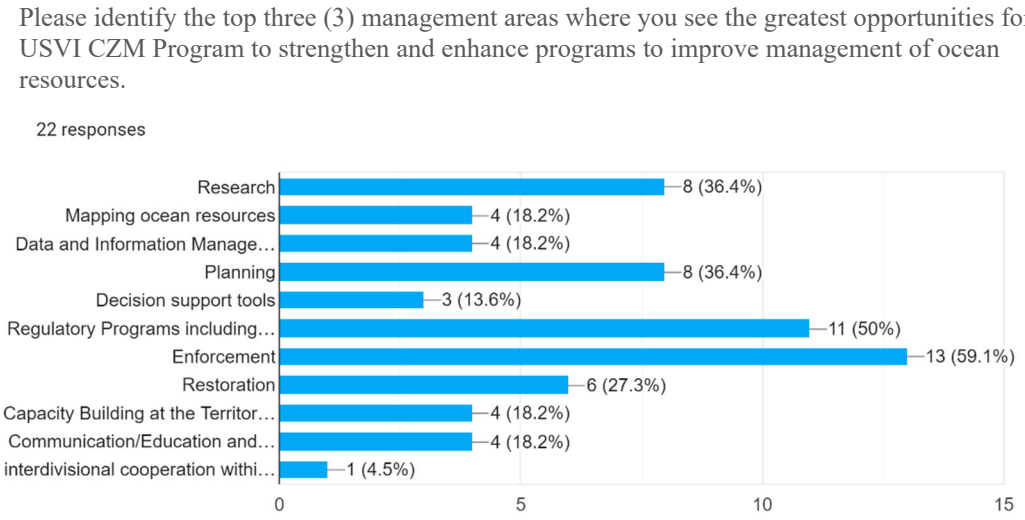
OCEAN RESOURCES

Key stakeholders were asked to identify which living and non-living ocean resources are most threatened and which management areas present the most opportunity for CZM to improve management of ocean resources.



Stakeholders indicated that living coral resources were most threatened, but also indicated (but did not rank) several other ocean resources that are threatened, including:

- Coastal pre-historic sites
- Water clarity
- Spatial resources, i.e., use of the bottom or shoreline
- Pelagic resources
- Invertebrates such as urchins, crabs, conch



Key stakeholders identified the following top management areas with the greatest opportunity for CZM to improve management of ocean resources:

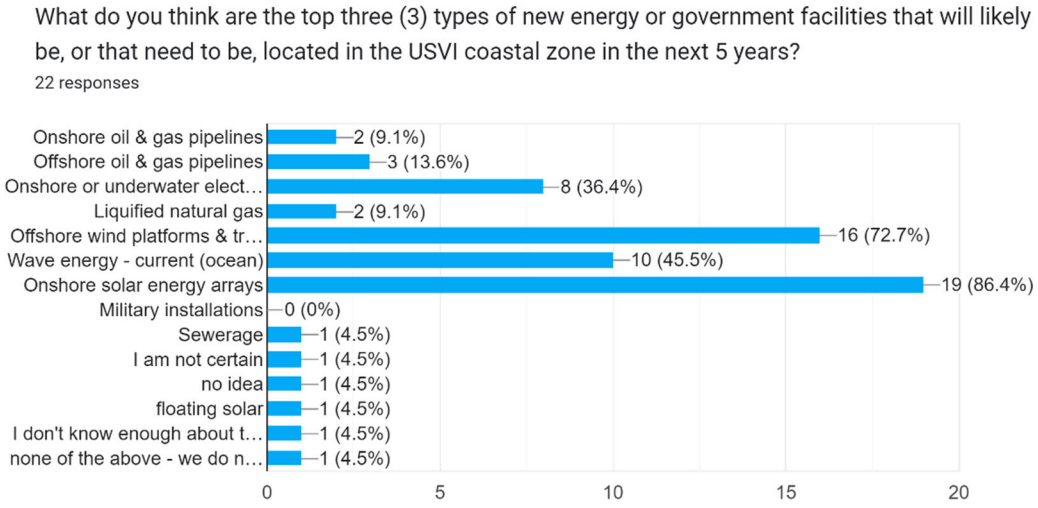
1. Enforcement
2. Regulatory programs including policies, ordinances, etc.

3a. Planning

3b. Research

ENERGY AND GOVERNMENT FACILITY SITING

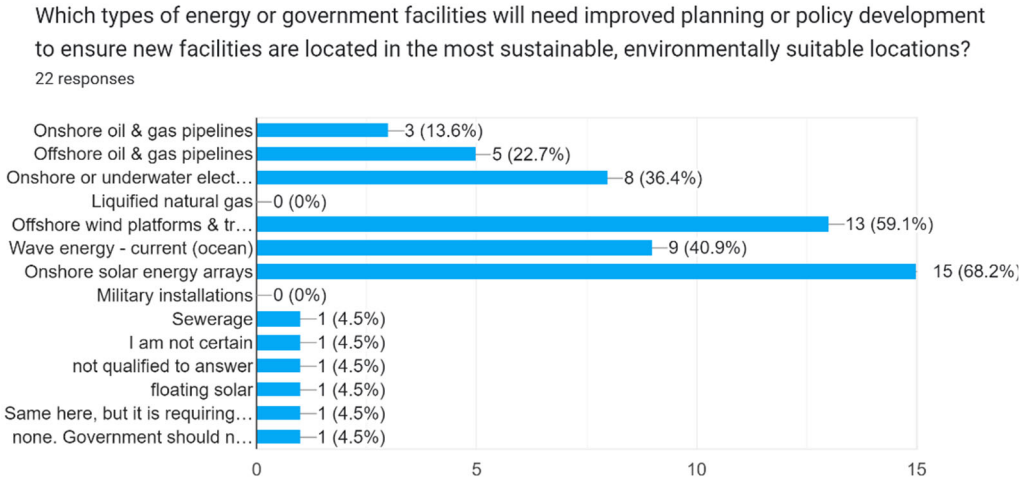
Key stakeholders were asked for feedback on energy and government facilities that might be sited in the coastal zone through the following questions:



Stakeholders indicated that the three new energy or government facilities that will be located in the coastal zone in the next five years would be:

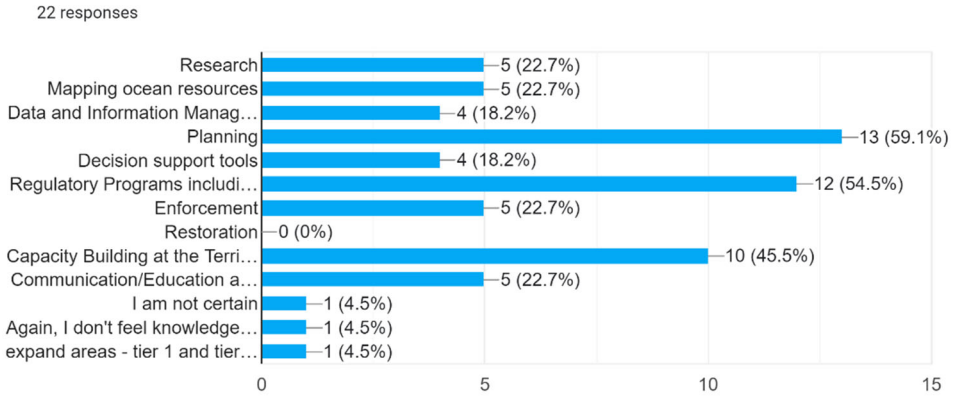
1. Onshore solar arrays
2. Offshore wind platforms and transmission lines
3. Wave energy – current (ocean) installations

They also had the option to indicate other potential facilities, and provided such feedback as, “sewerage,” “floating solar,” or “we don’t need any of this, especially a linkage to Puerto Rico which is being discussed.”



Stakeholders identified 1) onshore solar energy arrays, 2) offshore wind platforms and transmission lines, and 3) wave energy – ocean current facilities as the top three facility types that will need improved planning or policy development to ensure siting is sustainable. Onshore or underwater electric transmission lines was identified as a close fourth.

Please identify the top three (3) management areas where you see the greatest opportunities for the USVI CZM Program to strengthen and enhance programs to improve management of energy & government facility siting.

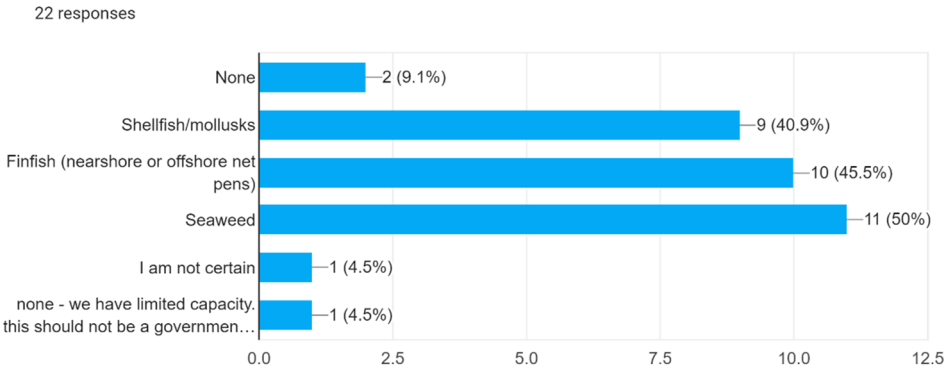


Stakeholders identified 1) planning, 2) regulatory programs including policies, ordinances, etc., and 3) capacity building at the territorial or municipal level as the greatest opportunities for CZM to improve management of energy and government facility siting.

AQUACULTURE

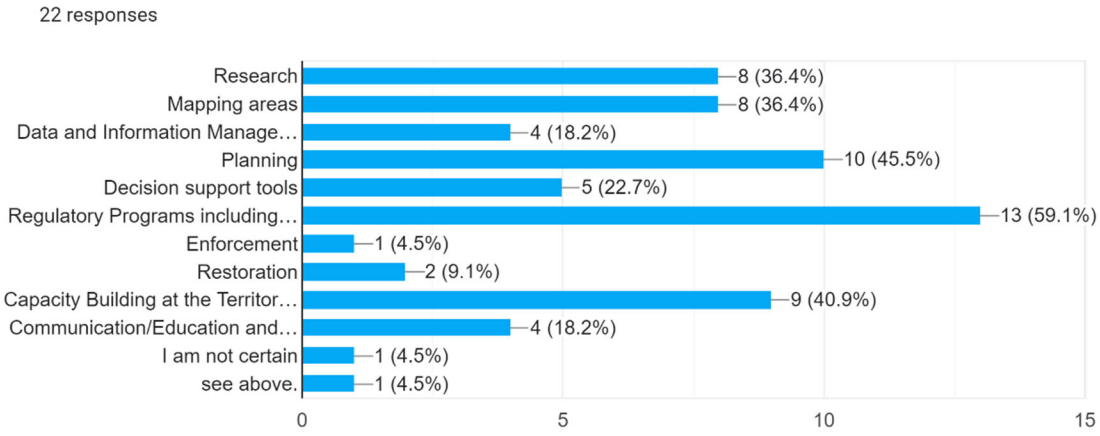
Key stakeholders were asked for feedback on aquaculture and mariculture operations that might be sited in the coastal zone through the following questions.

What types of Aquaculture operations (the cultivating of freshwater and/or saltwater populations under controlled conditions) do you think will be most likely applying for permits in the USVI in the next five years?



Stakeholders identified the cultivating of 1) seaweed, 2) finfish (in nearshore or offshore net pens), and 3) shellfish/mollusks as the operations most likely to be applying for permits in the USVI.

Please identify the top three (3) management areas where you see the greatest opportunities for the USVI CZM Program to strengthen and enhance programs to improve management of aquaculture/mariculture to ensure they are located and operated in the most sustainable manner.



Key stakeholders identified the following top management areas with the greatest opportunity for CZM to strengthen and enhance management of aquaculture/mariculture, so they are sited and operated in the most sustainable manner:

1. Regulatory programs including policies, ordinances, etc.
2. Planning
3. Capacity building at the at the territorial or municipal level

APPENDIX II – SUMMARY OF PUBLIC COMMENTS AND RESPONSES TO PUBLIC COMMENTS ON THE 2023-2025 USVI DRAFT §309 ASSESSMENT AND STRATEGY

CZM received ten sets of public comments on the USVI 2023-2025 Draft 309 Assessment and Strategy during the public comment period held from October 28, 2022, through November 26, 2022. Per NOAA Guidance, a summary of the public comments is provided below. CZM's responses to those comments are also included.

COMMENTOR: Cara Jo Hinton
DATE: 11/22/2022
COMMENT:
Page 28, lines 732 – 742, we offer the following:
All the waterfront belongs to the people. Current VI law already incorporates lateral access, which provides water access to all the shoreline in the USVI. The public's unobstructed right of transit to the shoreline is seaward of the shoreline. In addition, it is unlawful for any person to obstruct the public access along the shoreline with debris or vegetation, natural or human induced or enhanced, which inhibits the ability of the public to access the shoreline. Mandating land access via easements across private property to the entire shoreline would raise multiple concerns. The plan to provide that new shoreline developments provide access to the water is addressed below.
1. The Fifth Amendment Takings Clause provides that private property cannot be taken for public use without just compensation. Governments cannot force a private property owner to grant access across their private property. Simply put, the government cannot use a person's private property without providing compensation, either by purchasing it outright, or through eminent domain. Such compensation must be for the fair market value of the property, and for the adverse impact on the fair market value of the balance of the property.
2. Feasibility: The suggestion in the Plan is that all owners of waterfront property might have to create public access to the shoreline--be it beach, rocks, or cliff. This is not feasible without addressing parking areas for shoreline access points, without considering some determination of which portions of the shoreline are actually accessible. That alone is a monumental task. Access for the disabled would be required if this is a Territorial initiative, with designated points of access for disabled citizens; otherwise, every point of access would need to be ADA compliant. At the privately-held shoreline, there might be no access for emergency vehicles, to help people who are injured
3. Maintenance: Who would maintain these access points is of great concern. Constant clearing, grading and general maintenance would be an undue hardship to place on property owners,
4. Violation of the right to quiet enjoyment: Most privately held waterfront parcels are half acre lots, and most setbacks are 15-20 feet, so providing public access would often find strangers traversing in close proximity to the actual homes, and even transiting driveways and entrance roads which are in the setback. This should be a requisite of commercial development properties and major CZM permitted sub-division developments only, where there can be designated public parking and places for taxis to turn around when they drop their off passengers. A property owner finds an unfamiliar citizen on their rocky or cliffside property at 4 am (or any time for that matter) claiming they are allowed access to the

shoreline, could result in a tragic situation. In the VI, protective ordinances and laws have been put in place for reasonable hours of access and enjoyment, and to safeguard residents from intruders.
5. Liability: This would uniformly affect insurance for landowners on the shoreline. Who carries the liability coverage if somebody is injured on that land? Who is responsible when there is an injury on the path? If an injury occurs on the property or the trail access, or if there is trespassing onto a property just off the trail, due to new access, who pays the penalty? What happens to insurance costs now that Territorial mandated easements exist on private property? ADA compliance would certainly be required, further muddying the insurance/liability issues.
6. Financial and economic: If a person cannot build on shoreline property without providing public access, these property values will plummet, local residents holding land will lose their equity and might not be able to sell or develop it, and the tax base for the USVI will be dramatically reduced. It is hard to understand how [*comment as submitted ends incompletely*]

USVI CZM RESPONSE:
CZM has and continues to acknowledge that the provision and maintenance of public access is a complex issue. The key stakeholder feedback, and Phase I and II Assessments for Public Access identified needs for additional and improved access to the shoreline as well as challenges to providing that access. However, CZM has never advocated for taking private property and has counseled against past draft legislation that would have. Finally, as stated on page 83 of the document, CZM is not proposing changes to the current law, nor have they chosen to develop a strategy for this enhancement area.

COMMENTOR: Nicole Mynhier
DATE: 11/22/2022
COMMENT:
Page 28, lines 732-742
Mandating land access via easements across private property to the entire shoreline would raise multiple concerns. Of these, my own main concerns are to those surrounding the implications of this section as it would pertain to violation of the right to quiet enjoyment and liability to landowners.

Regarding right to quiet enjoyment, most privately held waterfront parcels are half acre lots, and most setbacks are 15-20 feet, so providing public access would often find strangers traversing in close proximity to the actual homes, and even transiting driveways and entrance roads which are in the setback. This should be a requisite of commercial development properties and major CZM permitted sub-division developments only, where there can be designated public parking and places for taxis to turn around when they drop their off passengers. A property owner finds an unfamiliar citizen on their rocky or cliffside property at 4 am (or any time for that matter) claiming they are allowed access to the shoreline, could result in a tragic situation. In the VI, protective ordinances and laws have been put in place for reasonable hours of access and enjoyment, and to safeguard residents from intruders.

Regarding liability, this would uniformly affect insurance for landowners on the shoreline. Who carries the liability coverage if somebody is injured on that land? Who is responsible when there is an injury

on the path? If an injury occurs on the property or the trail access, or if there is trespassing onto a property just off the trail, due to new access, who pays the penalty? What happens to insurance costs now that Territorial mandated easements exist on private property? ADA compliance would certainly be required, further muddying the insurance/liability issues. Thank you.

USVI CZM RESPONSE:
CZM has and continues to acknowledge that the provision and maintenance of public access is a complex issue. The key stakeholder feedback, and Phase I and II Assessments for Public Access identified needs for additional and improved access to the shoreline as well as challenges to providing that access. However, CZM has never advocated for taking private property and has counseled against past draft legislation that would have. Finally, as stated on page 83 of the document, CZM is not proposing changes to the current law, nor have they chosen to develop a strategy for this enhancement area.

COMMENTOR: John Galgay
DATE: 11/22/2022
COMMENT:
Page 27, lines 707-710
These statements are extremely broad and unsupported. A "conflict" is not defined, and the number of these insinuated events is not documented and no trend identified with supporting data. Impactful policy decisions must be based on agreed terms and applicable data.

USVI CZM RESPONSE:
There is a lack of documentation on public access conflicts. Information provided in the key stakeholder feedback, and used to inform the development of the A&S is both quantitative and qualitative.
CZM has and continues to acknowledge that the provision and maintenance of public access is a complex issue. The key stakeholder feedback, and Phase I and II Assessments for Public Access identified needs for additional and improved access to the shoreline as well as challenges to providing that access. Finally, as stated on page 83 of the document, CZM is not proposing changes to the current law, nor have they chosen to develop a strategy for this enhancement area.

COMMENTOR: Linda Darnell
DATE: 11/22/2022
COMMENT:
Page 28, lines 732 – 742, we offer the following:
All the waterfront belongs to the people. Current VI law already incorporates lateral access, which provides water access to all the shoreline in the USVI. The public's unobstructed right of transit to the shoreline is seaward of the shoreline. In addition, it is unlawful for any person to obstruct the public access along the shoreline with debris or vegetation, natural or human induced or enhanced, which

inhibits the ability of the public to access the shoreline. Mandating land access via easements across private property to the entire shoreline would raise multiple concerns. The plan to provide that new shoreline developments provide access to the water is addressed below.
1. The Fifth Amendment Takings Clause provides that private property cannot be taken for public use without just compensation. Governments cannot force a private property owner to grant access across their private property. Such compensation must be for the fair market value of the property, and for the adverse impact on the fair market value of the balance of the property.
2. Feasibility: The suggestion in the Plan is that all owners of waterfront property might have to create public access to the shoreline--be it beach, rocks, or cliff. This is not feasible without enormous expense.
3. Maintenance: Who would maintain these access points is of great concern. Constant clearing, grading and general maintenance would be an undue hardship to place on property owners,
4. Violation of the right to quiet enjoyment: Most privately held waterfront parcels are half acre lots, and most setbacks are 15-20 feet, so providing public access would often find strangers traversing in close proximity to the actual homes, and even transiting driveways and entrance roads which are in the setback. This should be a requisite of commercial development properties and major CZM permitted sub-division developments only, where there can be designated public parking and places for taxis to turn around when they drop their off passengers. A property owner finds an unfamiliar citizen on their property at 4 am claiming they are allowed access to the shoreline, could result in a tragic situation. In the VI, protective ordinances and laws have been put in place for reasonable hours of access and enjoyment, and to safeguard residents from intruders.
5. Liability: This would uniformly affect insurance for landowners on the shoreline. Who carries the liability coverage if somebody is injured on that land? Who is responsible when there is an injury on or off the path? What happens to insurance costs with mandated easements on private property?
6. Financial and economic: If a person cannot build on shoreline property without providing public access, these property values will plummet, local residents holding land will lose their equity and might not be able to sell or develop it, and the tax base for the USVI will be dramatically reduced. It could affect title policies.
7. Quality of life: Who is called when the homeowner's right to quiet enjoyment is constantly violated by people being loud on their way to the beach past a bedroom window. How safe and secure can we feel with public access adjacent to our homes at all times of day or night?
Please EXCLUDE homeowner land, and don't tie to building permits.

Page 72, lines 2039 – 2049, we offer:
That DPNR remain cognizant that some homesites have terrain that requires extensive infrastructure (i.e., driveways) before beginning the home design; and that drainage and runoff mitigation can achieve the same results as the proposed addition of the square footage of hardscape to the square footage of the home when calculating the allowed size of "improvements".

USVI CZM RESPONSE:
CZM has and continues to acknowledge that the provision and maintenance of public access is a complex issue. The key stakeholder feedback, and Phase I and II Assessments for Public Access identified needs for additional and improved access to the shoreline as well as challenges to providing that access. However, CZM has never advocated for taking private property and has counseled against

past draft legislation that would have. Finally, as stated on page 83 of the document, CZM is not proposing changes to the current law, nor have they chosen to develop a strategy for this enhancement area.
With respect to the R1 and R2 lot improvement requirements, CZM is proposing to clarify the intent of the existing legislation in order to avoid and minimize negative impacts associated with development such as erosion and flooding. Some of these negative impacts can be mitigated, however not all homeowners can afford to implement drainage and runoff practices that would fully mitigate the impacts from significant percentages of impervious cover on a site.

COMMENTOR: Juliet San Martin
DATE: 11/23/2022
COMMENT:
Page 28, lines 732-742
Public taking of the rights of property ownership.
There is nothing in the entire document that speaks to training / information for locals on how to treat coastal areas / access. for example, trash, loud music and, sadly, violence, mostly alcohol/drug fueled. Locals have no idea how to behave, other than do anything they want to do. With our large illegal population from less developed countries (DR, Haiti, for example), we continue to struggle with illegal fishing techniques and general trashing of the environment. Any public education is aimed only at those form off island, who are usually US citizens and do actually have equal rights. Training them, then have them observe locals violating the rules of behavior is counter productive, and unfair,
[*comment as submitted appears to end incompletely*]

USVI CZM RESPONSE:
While this comment does not directly relate to issues in the document, it is particularly offensive. The USVI is comprised of people from many cultures, and we have long-term, short-term, and seasonal residents as well as visitors. The local population is comprised of a melting pot of people from all over the world, including the U.S. mainland. Many residents “from off island” also assimilate and refer to themselves as local. CZM works to protect our coastal and marine resources, their services and benefits, and access to them for everyone. All residents are considered members of the public, and all are included in the target audience for CZM education and outreach efforts. It is important to reiterate that some Virgin Islanders have generational ties to historical cultures and practices involving our coasts, which should be respected. CZM welcomes constructive input and solutions for informing its continuously evolving outreach efforts.

COMMENTOR: Michael Milne
DATE: 11/23/2022
COMMENT:
Page 28, lines 732-742

Private land should not be taken by the government for public use. If the government wants to create access to the shoreline then they should do so on public lands and provide the infrastructure to do so properly, as do all governments with shorelines within the US.

USVI CZM RESPONSE:
CZM has and continues to acknowledge that the provision and maintenance of public access is a complex issue. The Phase I and II Assessments for Public Access identified needs for additional and improved access to the shoreline as well as challenges to providing that access. However, CZM has never advocated for taking private property and has counseled against past draft legislation that would have. Finally, as stated on page 83 of the document, CZM is not proposing changes to the current law, nor have they chosen to develop a strategy for this enhancement area.

COMMENTOR: David Silverman
DATE: 11/23/2022
COMMENT:
RE: Enhancement area prioritization
The commenter doesn't agree with the resulting prioritized EAs, or with the methodology used to prioritize them. The commenter has issues with the composition of the key stakeholder group and how the EAs and their prioritization relate to the goals of the VICZMP. The commenter provided their own methodology and resulting priority EAs:
The commenter suggests:

- Making coastal hazards a medium priority - the commenter believes coastal hazards are already being addressed through Hazard Mitigation Grants.
- Elevate priority of CSI to high, do a Phase II Assessment and create a Strategy.
- Elevate priority of SAMPs to high, do a Phase II Assessment and create a Strategy.

RE: Updating the CZMA
The commenter suggests several revisions to the CZMA to provide better protections in light of the current state and conditions of the territory:

- Change the CZM decision process for major vs minor - currently monetary-based (project cost), change to impact-based (see next bullet).
- Adopt a watershed impact approach to determining CZM permits, which would utilize a 'watershed impact scoring system' to more objectively define the impact of a proposed project to determine if it would be subject to the major or minor permit process.
- Eliminate the 2-tier boundaries to manage impacts on a watershed scale; adoption and uniform application of the watershed impact scoring system would functionally eliminate these boundaries.

RE: other CZM issues
The commenter is concerned with a lack of compliance with the CZMA and a perceived lack of uniform enforcement of the CZM rules and regs. Commenter noted that they believe this is due to: staff

shortages, inadequate consequences for violations, senior DPNR staff personal interpretation or misinterpretation and application of the CZM regulations (which regs need to be followed vs what the law requires), perception that DPNR enforcement is not uniform (some developers receive preferential treatment), and incomplete or total lack of regulation of certain activities. The commenter would like to see the emerging issue of "floating businesses/structures" defined and regulated by CZM (close existing loopholes and ambiguities around these types of structures). The commenter would like to see a strategy developed for management of sargassum.

USVI CZM RESPONSE:
The A&S is a CZM self-assessment. The process to develop the A&S followed the published NOAA Guidance. The input provided by CZM's key stakeholders represented just one source of information that CZM used to inform its decisions on enhancement area prioritization. CZM reiterates that the prioritization is RELATIVE – if an enhancement area was not elevated to a high priority that does not mean that it is not an important issue area or that work is not being done to address that enhancement area by CZM or it's partners through other means. Some elements of the coastal hazards enhancement area are being addressed through the Hazard Mitigation Grants, but there are additional hazard related needs that are well-suited to be addressed through the 309 program. Coastal hazards include erosion, runoff, and flooding which pose particular risks for the USVI and its coastal systems. CZM determined that ranking coastal hazards a high priority and developing a strategy to address them under the 309 program will directly and indirectly provide positive outcomes for several enhancement areas, not just coastal hazards, including cumulative and secondary impacts, wetlands, and ocean resources as noted on pages 13, 41, and 54 of the document respectively. The commenter's concerns specific to Special Area Management Planning will be addressed as part of current and ongoing planning initiatives such as the CLWUP and watershed planning efforts. Additionally, it should be noted that the 309 program is not intended to support all coastal zone management needs, it is intended to be applied to support efforts that address the highest priority needs that will lead to program changes.

With respect to review of major and minor permits, CZM considers both the cost and impact of a project. If both cost and impact were factors to categorize a residential permit as minor or major, then a significant portion of residential projects across the territory would have more impact per area of land than most major projects, thereby requiring a major permit application. This would require a change to the legislation and could also be interpreted as an infringement upon property owner rights to develop their property. CZM always considers major and minor permit applications on a watershed scale, cumulatively evaluating drainage patterns, slopes, impervious surface coverage, etc. to determine the overall impacts of each project. CZM also reviews applications through a coastal resilience lens, considering how the changing climate will impact a project at build and into the future.

CZM is aware of the challenges noted by the commenter and believes that the proposed strategy has elements that will address many of them. CZM is concerned by the assertion of preferential treatment; this statement is not backed up by empirical data. Interpretation of the law occurs throughout society, and CZM has always attempted to follow the law. Emergent issues, including floating businesses, are being investigated and as stated on page 69, a sargassum blueprint is currently under development.

COMMENTOR: Suzanne Mabe
DATE: 11/25/2022
COMMENT:
p. 28 1. Illegal Taking---VI Government is trying to implement measures that by their own admission in this document failed to be passed through legislation. Instead, the government, by administrative measures, i.e., the permitting process is trying to force property owners to give up a portion of their land in order to get their building permit. This is against the law, specifically the Fifth Amendment Takings Clause. It is illegal for a government to take private individuals land without following the legal process of taking it by eminent domain and giving to the property owner a payment equal to fair market value. That compensation will have to take into account the loss of value of the remaining parcel. This appears to be an effort by the government to hold property owners hostage and force them to comply with this illegal action if they have any intent of ever building.
2. Feasibility: The suggestion in the Plan is that all owners of waterfront property might have to create public access to the shoreline--be it beach, rocks, or cliff. This plan is without consideration of the law as stated above nor has thought been given to implementation. There is no discussion of how or where the public will park on our small estate roads, who will maintain these paths to the water, whose liability is it if one of the public falls or are swept out to sea from one of St Thomas incredibly steep north side shorelines (which in fact has happened). This requires owners who would not themselves go to water's edge because it is hazardous to provide public access.
3. Further to law, every warranty deed recorded has a clause guaranteeing the owners right to private enjoyment. This plan would put the public traversing through what is in effect someone's front yard. Where does this end? Shouldn't some private yards be declared botanical gardens now open to the public. What if there is a stone wall or cistern from the 1700's on your property. These are very much part of the island culture which is purportedly what this is all about. It is not.
4. Solution--the VI has funds. It is a matter of where our executive and legislative branches chose to spend them. Money could be far better spent on identifying lands that are truly appropriate as public park and camping areas or land to be preserved and to purchase those properties. As stated, there needs to be an overall plan for recreational resources

Page 72, lines 2039-2049
We do not need to change the portion of the lot that can have improvements. What DPNR needs to do is first enforce the set backs established by the government and if more restrictive, the deed restrictions and to stop builders from stripping every piece of vegetation from a lot vs. just the needed building envelope. There should be serious fines for this action. When we have heavy rains as we did this November and most Novembers the run off goes into the waters killing our corals.

USVI CZM RESPONSE:
CZM has and continues to acknowledge that the provision and maintenance of public access is a complex issue. The key stakeholder feedback, and Phase I and II Assessments for Public Access identified needs for additional and improved access to the shoreline as well as challenges to providing that access. However, CZM has never advocated for taking private property and has counseled against past draft legislation that would have. Finally, as stated on page 83 of the document, CZM is not proposing changes to the current law, nor have they chosen to develop a strategy for this enhancement area.

With respect to the R1 and R2 lot improvement requirements, CZM is proposing to clarify the intent of the existing legislation in order to avoid and minimize the negative impacts associated with development such as erosion and flooding, as mentioned by the commenter.

COMMENTORS: Lorine Williams and Amy Land-de-Wilde
DATE: 11/25/2022, and 11/26/2022, respectively
COMMENT:
The following comments were submitted by the above two commenters on the stated dates with the exact same verbiage below.
Page 28, lines 732-742
Granting public access to the beach is a hallmark of VI culture but it can't be retroactively granted to already existing properties, especially residential properties. It's just not practical. There often is just not enough space or square footage to provide access for the public, never mind the other considerations that our membership has mentioned, such as parking, topography, safety, noise, liability. Any such requirement would place an undue hardship on a property owner, would spoil their quiet enjoyment, infringe on that property owner's basic rights and would probably constitute a "taking".

For NEW subdivisions or land planning, public access, adequate parking, security should definitely be a major consideration. Please edit the language to exclude existing residential properties in providing public beach access. Thank you for your consideration and deliberation.

USVI CZM RESPONSE:
These comments are not relevant. The section being commented upon references draft legislation that was not passed. Nowhere in the document has CZM suggested retroactively granting public access on existing properties. CZM has and continues to acknowledge that the provision and maintenance of public access is a complex issue. The key stakeholder feedback, and Phase I and II Assessments for Public Access identified needs for additional and improved access to the shoreline as well as challenges to providing that access. However, CZM has never advocated for taking private property and has counseled against past draft legislation that would have. Finally, as stated on page 83 of the document, CZM is not proposing changes to the current law, nor have they chosen to develop a strategy for this enhancement area.
