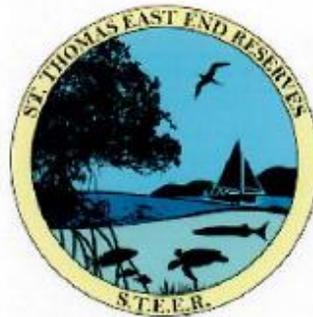


US Virgin Islands
Department of Planning and Natural Resources
Division of Coastal Zone Management

**Updating the St. Thomas East End Reserves (STEER) Management Plan to recover and improve coastal
resilience in the US Virgin Islands**

Proposal for the 2020-2022 Coastal Management Fellowship
Submitted to the NOAA Coastal Services Center



Submitted by:

A handwritten signature in blue ink, appearing to read "Hilary Lohmann", written over a horizontal line.

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1. Background and Introduction

The US Virgin Islands (USVI) has been an American territory since 1917. The main islands of St Thomas, St John and St Croix and several smaller islands and cays of the USVI are in the heart of the Caribbean, east of Puerto Rico and bordered to the west by the British Virgin Islands. The island of St. Thomas is volcanic in origin, with topography that is dominated by mountainous slopes. It lacks much of a coastal plain, and has an extremely irregular coastline with many embayments. Rainfall tends to collect as surface flow rather than subsurface flow due to thin, clay-like soils and relatively impermeable underlying rock, therefore runoff is a way of life.

On the southeast of St Thomas lies the St. Thomas East End Reserves (STEER). STEER is a marine protected area (MPA) composed of several smaller protected areas, namely Cas Cay / Mangrove Lagoon, St James, and Compass Point Marine Reserves and Wildlife Sanctuaries (MRWS). As part of a larger, territory-wide system of MPAs, STEER is designed to protect a complex and critical system of coastal resources and ecosystem services.

STEER encompasses 9.6 km² of significant coastal, marine and fisheries resources, including mangrove forests, salt ponds, lagoons, reefs and cays. STEER is thought to be one of the most valuable fish nursery areas remaining on St. Thomas. Many species of fish and shellfish, including important commercial and sport fisheries resources, spend a portion of their life protected in the shallow mangrove and seagrass beds while feeding and growing before populating other marine habitats in the area. These natural resource-rich areas were declared Areas of Particular Concern (APCs) in 1979, a NOAA Priority watershed in 2010, and a Virgin Islands Coral Reef Priority Area in 2018 and 2019. STEER had a Management Plan¹ developed in 2011 and a Watershed Management Plan² developed in 2013.

The largest remaining tract of mangroves on St Thomas is found within STEER. The mangroves provide the well-documented ecosystem services of fisheries nursery, water filtration, and coastal defense via wave attenuation. Virgin Islanders were reminded of the hazard mitigation benefits provided by these mangroves in 2017, when two category five hurricanes hit the islands. The mangroves in STEER protected the adjacent coastal infrastructure, communities and vessels berthed in its coastal waters. STEER mangroves protected St Thomas but were severely damaged in the process. Recovery is vital to the future services and benefits that STEER can provide, from storm protection to marine tourism and fisheries. A joint research project between the University of the Virgin Islands (UVI) and the US Geological Survey (USGS) focuses local and federal attention to mangrove recovery, which is unfortunately slow.

The ecological assets of STEER extend beyond the mangroves, however. The Reserves contain six offshore cays that are considered St. Thomas' most important assets due to their pristine state. There are salt ponds with local and migratory birds inhabiting them; coral reefs with important ecological and recreational value, and sea grasses that serve as a nursery and feeding grounds for commercially and recreationally valuable fishes.

¹ STEER Management Plan (2011)

https://horsleywitten.com/STEERwatersheds/pdf/managementPlans/STEERManagementPlan/STEER_Management_Plan_Final_low.pdf

² STEER Watershed Management Plan (2013)

https://data.nodc.noaa.gov/coris/library/NOAA/CRCP/project/20733/1305031_STEERWatershedPlanandapdsABC.pdf

Over the years, USVI resource agencies including the Department of Planning and Natural Resources (DPNR)'s Division of Coastal Zone Management (CZM), Division of Fish & Wildlife (DFW), Division of Environmental Protection (DEP), and the University of the Virgin Islands (UVI) have gathered a wealth of information related to the area's fish, turtle, bird, coral reefs, sea grasses, salt pond dynamics, mangroves and water quality. More recently, UVI's Center for Marine and Environmental Studies, NOAA, Gulf of Mexico Foundation and The Nature Conservancy (TNC) have also been active in research, restoration and management initiatives.

Human impacts on the area are substantial. There are six hotels /resorts/condominium associations and nine marinas and boat yards along the Marine Reserves boundary. These developments include reverse osmosis plants, a waste water treatment plant, fueling facilities, back-up generators, and public access points to the water. A large housing community, rock mining quarry and a horse racetrack are located just north of the Mangrove Lagoon. The municipal landfill for both St. John and St. Thomas borders the western end of STEER.

STEER's value and vulnerability have been exposed. The ecosystems and their services are vulnerable to slow natural recovery from the storms, and more. Watershed activities like the landfill, racetrack and rock mining quarry have documented nutrient and heavy metal impacts³ on water quality that drains into STEER waters. Land development has altered the natural ghat hydrology and, along with increased flooding brought on by climate change, disrupts the pace and place of water drainage².

While STEER resources are facing a particularly large onslaught of stressors at the moment, there is also an exceptional window of opportunity to address these issues. There is a swell of activity surrounding natural habitats as coastal defense infrastructure^{4,5}. Mangrove management and restoration are highlighted in conversations about climate change, hazard mitigation, and resilience⁶. *The Coastal Management Fellowship scope of work is to update the STEER Management Plan, to ensure that this historically prioritized area continues to function.* The STEER Advisory Group, composed of managers and researchers, prioritizes the additional technical capacity provided by the Coastal Management Fellow to ensure that STEER management is incorporating local and international research; lessons learned; and opportunities for partnerships and funding, to preserve the area's ecosystem services. Updating the STEER Management Plan is a management priority for DPNR-CZM.

The host agency for the NOAA Coastal Management Fellowship in the U.S. Virgin Islands is the division of Coastal Zone Management within the Department of Planning and Natural Resources. The successful applicant will be located in the St. Thomas office.

The Virgin Islands Coastal Zone Management Act was passed by the USVI Legislature in 1978 as a mechanism to regulate development and manage territorial coastal resources. The Virgin Islands Coastal Zone Management Program (VICZMP) is working on a number of new initiatives in an effort to lessen

³ Pait, Anthony S., et al. "An assessment of chemical contaminants in sediments from the St. Thomas East End Reserves, St. Thomas, USVI." *Environmental monitoring and assessment* 186.8 (2014): 4793-4806.

⁴ Guannel, Greg, et al. "Integrated modeling framework to quantify the coastal protection services supplied by vegetation." *Journal of Geophysical Research: Oceans* 120.1 (2015): 324-345.

⁵ USACE. "Engineering with nature: Strategic plan 2018-2023: expanding implementation."

⁶ Menéndez, Pelayo, et al. "Assessing the effects of using high-quality data and high-resolution models in valuing flood protection services of mangroves." *PloS one* 14.8 (2019): e0220941.

the negative impacts on our coastal zone and its resources, with the stated goal of using a watershed approach to guide all developments and protection efforts⁷.

2. Goals and Objectives

The goal of the Coastal Management Fellow is to produce an updated St Thomas East End Reserves' 5-year Management Plan through a transparent, inclusive and fully informed process in order to provide managers (DPNR-CZM) and partners (STEER Advisory Group) with a prioritized set of actions that protect the ecosystem services of STEER for the social and ecological communities of St Thomas.

The objectives are:

- Assess progress toward STEER management goal: *to restore and maintain a functional coastal ecosystem that promotes sustainable recreational opportunities and compatible commercial uses with community engagement through effective management*, by completing the evaluation rubric provided in the previous STEER management plan¹;
- Engage with stakeholders on progress, challenges and opportunities to meet management goals through a number of forums and mediums (meetings, social media, public events);
- Manage stakeholder involvement, including data sharing, analysis, and interpretation;
- Analyze, interpret and incorporate new information on water quality and climate change;
- Design a water quality monitoring program for STEER to determine specific pathways of heavy pollutant flows, building upon recent identification of hot spots⁸;
- Evaluate and adjust goals and activities to reflect current and future priorities; and
- Identify novel opportunities to access federal resilience and post-hurricane funding for STEER management needs.

The outcomes are:

- An updated STEER Management Plan;
- Inclusion of a water quality monitoring program in the updated STEER Management Plan;
- Preservation of CZM's commitment to and history of stakeholder consultation and public review in management and planning activities;
- Managers and partners are prepared to leverage post-hurricane and other funding resources for coastal resilience in STEER.

⁷ <https://dpr.vi.gov/czm/director-of-viczmp/>

⁸ Clower, P. Owen. "An investigation into temporal and spatial trends of contaminants in Mangrove Lagoon, St. Thomas East End Reserves (STEER), U.S. Virgin Islands." *Master of Science in Marine and Environmental Science thesis*, University of the Virgin Islands (2019).

3. Milestones and Outcomes

Below is a table that outlines the Fellowship’s milestones and a timeline for completion.

Fellowship month	Milestone completed	Milestone description
3	Literature review and partner meetings	Review old Management Plan, historical documents, new research and related projects; integrate with STEER Advisory Group, partners and stakeholders
6	First stakeholder meeting on STEER Management Plan update: Planning	Host public meeting to introduce STEER Management Plan update: discuss progress toward previous STEER goals and recent research, identify roles for partners in management plan update process
10	First draft of STEER water quality monitoring program	Review first draft of water quality program design with STEER Advisory Group
14	First draft of STEER Management Plan update	Submit first draft of updated STEER management plan to supervisors at CZM and STEER Advisory Group; identify challenges and gaps that must be addressed to finish the project
16	Second stakeholder meeting on STEER Management Plan update: First draft review	Host public meeting to review first draft of STEER Management Plan update; identify questions and concerns from stakeholders that must be incorporated in final draft
20	Second draft of STEER Management Plan update	Incorporate feedback from supervisors, Advisory Group, partners and stakeholders into Management Plan update
21	Third stakeholder meeting: Second draft review	Host public meeting to review second draft of STEER Management Plan update
24	Final draft of updated STEER Management Plan	Deliver updated 5-year STEER Management Plan to CZM

4. Project Description

The Coastal Fellow will update the 5-year Management Plan for STEER, fulfilling a top priority for DPNR and the STEER Advisory Group, and providing a roadmap for management activities like water quality monitoring and climate adaptation for coastal resilience in St Thomas.

There are several aspects to updating the management plan. The Fellow will lead and coordinate all efforts, ensuring stakeholder engagement and input throughout the process. The Fellow will conduct the following activities:

- review of the previous Management Plan and other relevant documents (some listed in this document);
- coordinate and lead meetings with a variety of stakeholders, including the STEER Advisory Group;

- assess progress made toward goals in previous STEER Management Plan;
- identify successes and challenges in STEER management, and highlight how to adapt for more effective next steps;
- incorporate recent research on water quality, watershed impacts, and climate change into management plan goals and activities;
- create a new management plan section for water quality monitoring;
- create a new management plan section for climate change adaptation and resilience;
- increase local awareness of and engagement in the management updating process by developing posts about STEER benefits and threats, that will be shared through CZM's social media account before public meetings;
- increase local understanding and valuation of STEER's ecosystem services for coastal resilience at public events around the territory; and
- investigate opportunities to access technical and fiscal resources for disaster recovery and resilience, to achieve STEER management goals.

The Fellow is responsible for incorporating new information into the STEER management plan. Since the last management plan update in 2014, several scientific studies and other forms of investigation and research have been conducted in and around STEER. Information on water quality, watershed impacts, human uses and mangrove recovery in STEER must be reviewed with stakeholders and worked into the management plan. The Fellow will create a water quality monitoring program designed for STEER needs and consistent with VI capacity. The Fellow will include specific threats and indicators of climate change vulnerabilities and adaptive capacity for STEER resources.

The Fellow will organize and lead at least three (3) public meetings for STEER stakeholders to learn about and contribute to the Management Plan update process. The Fellow will develop and post relevant information on CZM's social media account at least two (2) times before each public meeting to increase local awareness and meeting attendance. The Fellow will also promote the coastal resilience benefits of STEER resources at public events around the territory, such as CZM's Science Saturday's, and annual events like Reef Fest, UVI Research Day, and the Agricultural Festival.

Hurricanes Irma and Maria struck the USVI in 2017, and since then the islands have been visited by tropical storms and low-grade hurricanes annually. From government to civic and commercial groups, across sectors and interests, climate change and hazardous storms and flooding have been at the forefront of conversation in the Virgin Islands. In addition, the importance of climate adaptation and hazard defense has been brought to the forefront of federal attention and funding. The Fellow will help DPNR-CZM to leverage this collective swell of attention and resources that can meaningfully affect progress toward STEER's management goals.

5. Fellow Mentoring

The Fellow Mentor is the Coastal Resilience Coordinator for the division of Coastal Zone Management of the Department of Planning and Natural Resources, Hilary Lohmann. The Resilience Coordinator will work closely with the Coastal Fellow on the development of a work plan, provide guidance throughout the process of updating the management plan including resources acquisition and stakeholder engagement, and keep the Fellow on track for timely project deliverables. Hilary will ensure that the Fellow's activities support the Fellowship goals and also the professional development goals of the Fellow. As a recent alumnus of the Coral Management Fellowship Program, Hilary is in a unique position

to guide and support the Coastal Fellow in acclimating to the CZM work environment and succeeding in their 2 year program.

The USVI Coastal Fellow will be welcomed by a variety of professionals and exposed to different agencies throughout their work. These include managers and researchers from local government, federal government, academia and more. Individuals who will guide and support the Coastal Fellow include the Director of CZM, Marlon Hibbert, who will ensure the integration of the Fellow into wider DPNR networks and activities. Both the Chair (Leslie Henderson) and Lead Researcher (Dr. Kristin Grimes) of the STEER Advisory Group will provide resources, historical context, and technical guidance throughout the Fellowship. The Fellow will participate in staff meetings and will be provided opportunities to participate in site visits, intra- and inter-agency meetings, and other relevant activities in the territory.

There are several other projects that DPNR and partners are working on, that the Fellow will have the opportunity to support. For example, a long-term mangrove recovery study with UVI and USGS is expanding to more sites around the Virgin Islands. The CZM GIS manager is collecting data and developing layers for watershed characterization. The Coastal Resilience Coordinator is developing policy adaptations for a resilient VI coastline. The Coral Reef Initiative Coordinator and NOAA Fisheries Liaison are studying nursery functions of VI mangroves. The NOAA Coral Reef Management Fellow will be working on ecosystem restoration in St Croix. The CZM Outreach and Education coordinator runs several projects focused on marine debris and the development of locally-relevant environmental education and outreach tools.

6. Project Partners

Below is a list of agencies and institutions with projects occurring in STEER and/or its watersheds. Many of them are stakeholders that the Coastal Fellow will engage with throughout the process of updating the STEER Management Plan, from gathering resources to technical advice and draft reviews.

Project Partner	Relevant Projects/Programs
STEER Advisory Group	Responsible for implementing STEER management plan
University of the Virgin Islands (UVI)	Researchers' topics include water quality, fisheries nurseries, watershed hydrology and carbon sequestration
DPNR division of Environmental Protection (DEP)	Responsible for territorial water quality monitoring, from upper watersheds to coastal and offshore sites
DPNR division of Fish and Wildlife (DFW)	Responsible for territorial living resources, from fish stocks to fishery nurseries and other critical habitats
Virgin Islands Coral Reef Advisory Group (VICRAG)	Responsible for guiding coral reef research and management priorities
NOAA Fisheries	Responsible for informing, guiding and funding projects in the territory that support local fish stocks, including through habitat restoration
BioImpact, Inc.	Local contractor for environmental impact assessments and advocate for best environmental practices in STEER and its watersheds

Virgin Islands Experimental Program to Stimulate Competitive Research (VI-EPSCoR)	Research and citizen science branch at UVI with a new 6-year focus on Resilience
Local stewards: Water Bay Homeowners Association & Friends of Christmas Cove	Property owners and managers in the area contribute to citizen science and outreach related to boater best practices in STEER

7. Cost Share Description

The division of Coastal Zone Management will provide office space and supplies that are required for the STEER management plan update, including a desktop computer, ArcGIS mapping software, and Microsoft Office. The Fellow will be granted a DPNR work email address and have access to the resources of the local government. As host agency, CZM will provide meeting spaces for stakeholder engagement activities, historical data and documents related to STEER and its watersheds, and networking support to ensure the Fellow has timely access to a variety of stakeholders and partners. DPNR-CZM will provide \$15,000 in nonfederal fellowship matching funds.

8. Strategic Focus Areas

The USVI Coastal Management Fellow’s goals and activities support and align with the Fellowship’s Strategic Focus Areas. More specific descriptions are below.

Healthy Coastal Ecosystems: “Support coastal and ocean resource managers through *cooperative funding, data, information, tools, training, technical assistance, analysis, and exchange of best practices* to strengthen ecosystem policies, build capacity, and *implement prioritized management efforts.*”

By updating the management plan for STEER, the Coastal Management Fellow will be implementing a DPNR management priority for the entire territory. The Fellow will support managers by gathering, synthesizing, and incorporating new information into the plan; designing a new water quality monitoring plan; outlining and guiding next management steps; and identifying funding opportunities to fulfill STEER management efforts for coastal resilience.

Resilient Coastal Communities: “Build capacity to pursue strategies such as *hazard preparedness, mitigation, and post-hazard redevelopment planning* by providing an *integrated suite of data, information, training, technical assistance, cooperative funding, and policy tools* to coastal communities.”

The updated STEER Management Plan produced by the Fellow fulfills a federally recommended strategy for hazard preparedness and mitigation for flooding in the Virgin Islands. The Coastal Fellow will contribute to the Virgin Islands’ recovery from hurricanes Irma and Maria in 2017, and build resilience for future storm conditions. STEER is a historical natural buffer, which needs to be better managed to function as a defense in more frequent and intense future storms.