Ridge to Reef and Beyond: The Challenges and Opportunities of Hazard Mitigation in the U.S. Virgin Islands

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The Ridge to Reef Approach

• A holistic approach that addresses flooding and water management (quantity and quality) from the highest land elevations to the coastal reef beds

• Includes coordination of multiple federal and Territorial funding sources and programs
Opportunities and Challenges: The Factors

- **Political Framework** – Simplicity of Decision Making
- **Funding Amount** – Available – Is the Total Pot Enough to Make a Difference?
- **Fiscal Limitations** – Do the Grant Recipients Have Resources?
- **Geography and Topography** – What Works?
- **Human Resources** – Numbers and Expertise
- **Cultural and Social Issues** – What Solutions Are Palatable?
Background related to the event

Two Category 5 Hurricanes in two weeks – Irma and Maria
Before and after the storms...
Summary of Hurricane Impacts

- Damaged more than 90% of above-ground power lines and knocked down more than half of all wood poles.

- Damaged more than 23,000 Virgin Island households — about 54% of all homes — with more than 13% with severe damage, and about 85% of all residential structures had some storm-related impacts.

- The US Virgin Islands only two major hospitals both sustained severe storm damage and other clinics and critical healthcare facilities throughout the Territory were Badly Damaged.

- Crippled roads and transportation facilities throughout the Territory. Airports on St. Croix and St. Thomas closed for two weeks.
HMGP Funding Availability – 12-month lock-in

- Hurricane IRMA DR-4335 = $32,951,711
- Hurricane Maria DR-4340 = $428,927,038
- Total HMGP Funding = $461,878,749
Governmental Challenges and Advantages of Implementing Hazard Mitigation in the USVI

There is only one level of government and no municipal, county or local governments.

- Governor sets priorities
- Agencies and non-profit organizations develop projects in coordination with VITEMA and with WOB technical assistance

FEMA and VITEMA are working extremely closely to meet Territorial mitigation goals and to ensure eligible and technically feasible mitigation projects are funded expeditiously.

Cash Flow is a significant issue, even with 100 percent federal funding for the HMGP.
Implementing Hazard Mitigation

Notice of Intent (NOI) Process - $800 million in conceptual projects submitted – almost double what is available.

Roads, power, housing, government buildings, communications, flood reduction were determined to be priorities by the Governor.

The list of eligible projects moving forward for development is one of the most diverse that the seasoned FEMA staff had seen.
As of 18 month post-disaster point, more than 50% of the available HMGP funding is either awarded, submitted to FEMA for review, or in development with anticipated submission within the next 90 days.
Early projects funded and implemented – low hanging fruit with a large impact.

<table>
<thead>
<tr>
<th>Advance Assistance to VITEMA and DPNR for project development</th>
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<tbody>
<tr>
<td>$7.3M for building code development and enforcement</td>
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<tr>
<td>Geodetic Survey Marker and System Update</td>
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<td>$4.7M for Comprehensive HM Plan for Territory</td>
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Unique Flooding Issues in the USVI

No rivers – Ghuts (from Danish) are drainageways which run from top of steep slopes to ocean. Not well maintained.

Flooding from Ghuts Washed away roads and infrastructure

Non-permitted construction affecting natural drainageways
Flooding with the storms
Typical road issues to Mitigate
Slope and Drainage Issues
Wind retrofit and related projects

- Developing residential housing retrofit based on unmet needs from the STEP program
- Public Housing owned by VIHA and VIHFA
- Government Building wind retrofit
  - VITEMA EOC
  - VIPD HQ
VITEMA EOC Retrofit
Fire Station Retrofit and Reconstruction
Hurricane Safe Rooms

- Government Buildings
  - EOCs
  - Fire and Police
- Community Safe Rooms
- Residential Safe Rooms
- Hotels
How to address Climate Changes that will impact the US Virgin Islands (USVI)

Temperatures are rising. Rainfall patterns are, and will continue to be, highly variable. The Territory will get drier by the end of the century.

Seas are rising, and they will submerge—intermittently at first, but eventually permanently—economically and culturally important coastal areas such as beaches, buildings, critical infrastructure, and roads.

Hurricanes and swells will become more powerful—not necessarily more frequent—causing more wind damage, longer and more intense rainstorms, greater inundation, and more severe coastal erosion.
Innovative Projects to Address Climate Change

• Coral and Mangrove restoration

• University of the Virgin Islands Living Shoreline Database

• TNC Reef Mapping

• Comprehensive Hazard Mitigation Plan to integrate Climate Change Issues
The waiver of the local match requirements for HMGP has been extremely beneficial in expediting project development and implementation.

Costs are substantially higher in the USVI due to its relative isolation. We are using a 1.5 multiplier for costing of projects and for the BCA calculations.

The topography of the USVI provides challenges for building and for the placement of infrastructure.

Flooding is challenging given the steep slopes and lack of space for drainage improvements.

Having one level of government has streamlined the prioritization, application development, and approval process for HMGP grants in the USVI.