

UVI, VIWMA, DPNR and EPA



presents...

Earth Day

2021





What's Happening with Solid Waste in the USVI?

WEDNESDAY, MAY 5TH 2021
12NOON - 1PM AST

REGISTER AT [HTTP://BIT.LY/SOLID-WASTE-USVI](http://bit.ly/solid-waste-usvi)

UVI, VIWMA, DPNR and EPA

presents...

Earth Day 2021

Tune in every Wednesday in May from
12 noon-1pm

5th **What's Happening with Solid Waste and Sustainable Materials Management in the USVI?**

<http://bit.ly/solid-waste-usvi>

12th **What Are We Wasting and What Can We Do About It?**

<http://bit.ly/waste-audit>

19th **What Are Other Islands Doing with Their Materials?**

<http://bit.ly/island-solid-waste-examples>

26th **What Should We Do Next to Manage Our Materials more Sustainably?**

<http://bit.ly/community-vision-solid-waste>



For more information visit: www.cgtc-usvi.com

Today's Agenda

- **What words come to mind when you think of Solid Waste?** – In your own words
- **Federal Overview:** United States Environmental Protection Agency
- **Regulatory Overview:** Virgin Islands Department of Planning and Natural Resources
- **Operational Overview:** Virgin Islands Waste Management Authority
- **System Overview:** University of the Virgin Islands Caribbean Green Technology Center

What words come to mind
when you think of **Solid
Waste** in the Virgin Islands?

Go to: www.menti.com
Code: **6991 3728**



DPNR
Regulatory,
Oversight,
Enforcement

VIWMA
Management,
Operations,
Enforcement

DPW
Emergency
Operations,
Infrastructure

US EPA
Oversight,
Technical Assistance



NGOs
Support,
Advocacy



Preserving Paradise
Sustainable Materials Management in the USVI
Kimiko Link, USEPA Region 2

EPA's Sustainable Materials Management Hierarchy



USVI Materials Management Issues

- Delayed program approval
- Only 2 existing disposal locations both subject to EPA/DOJ Orders and are near capacity with ongoing operational challenges.
- Limited waste diversion programs
- Historic underfunding
- No tipping fees/source of sustainable revenue to maintain and expand SMM operations



Sustainable Materials Management in the USVI-USEPA Efforts

- **Coordinate and Collaborate with and Provide Technical and Funding Assistance to VI Government Agencies- Primarily VIDPNR, VIWMA, VIHFA, VIODR, UVI**
- **Approve of VI's RCRA Subtitle D Municipal Solid Waste Landfill Permit Program**
- **Ensure federal landfill standard compliance at VI landfills**
- **Provide Technical Guidance For and Administer EPA's 10M Supplemental Grant to USVI-DPNR and WMA**
- **Maintain Sustainability Advisor on USVI To Assist With Disaster Recovery Coordination**
- **Fund and Assist With Development of VI 2019 Waste Characterization Study**
- **Fund and Guide Development of 2020 VI Commodities Market Analysis**
- **Assist With Coordination of HUD CDBG Disaster Recovery and Mitigation Funding for Solid Waste Activities- approx. 150 M**
- **Assist With Coordination of FEMA Public Assistance and Hazard Mitigation Funding for Solid Waste Activities**
- **Assist With Coordination of USDA, EDA and Other Funding Opportunities**
- **Coordinate and Convene International Islands Materials Management Collaboration Opportunities**
- **Revive ReCaribe**
- **Explore Intersectionality of Sectors and Symbiotic/Collaborative Opportunities**
- **Assist with Development of USVI Integrated Sustainable Materials Management Plan**

EPA SUSTAINABILITY PRIORITIES FOR USVI

Priorities

- Solid Waste
- Wastewater and Drinking Water
- Green Infrastructure – Storm Water Management
- Septic Systems
- Cisterns
- Medical Waste Handling
- Healthy Homes and Built Environment / Mold, Lead, Asbestos Remediation
- Brownfields Redevelopment
- Coral Reef Restoration
- Capacity Building

Local Agency Partners Include

- VI Department of Planning and Natural Resources (DPNR)
- VI Waste Management Authority (WMA)
- VI Department of Public Works (DPW)
- VI Department of Health (Public Hospitals)
- VI Water and Power Authority (WAPA)
- VI Office of Disaster Recovery
- VI Housing and Finance Authority (HFA)
- University of Virgin Islands (UVI)
- Office of Disaster Recovery (ODR)
- EPA's Caribbean Science Consortium Members (Academia and NGOs)

LEVERAGING FEDERAL FUNDING SOURCES FOR USVI



EPA Disaster Supplemental and Programmatic Funding

- **\$10M** - “hazardous waste financial assistance grants program and for other solid waste management activities” related to HIM
- **\$581,000** - EPA’s Superfund Program (TuTu Wellfields Repairs)
- **\$400,000** - EPA’s Leaking Underground Storage Tank Fund
- **~\$30M** - Clean Water Act (CWA) Construction Grants (wastewater and stormwater infrastructure)
- Brownfields Redevelopment Program

Other Federal Partners Include

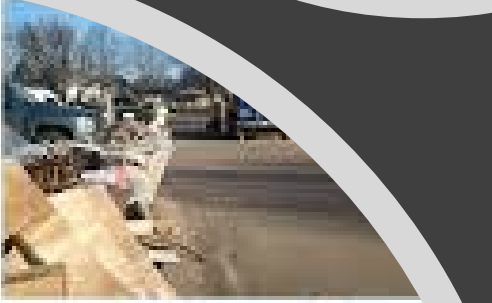
- FEMA Public Assistance (406) and Hazard Mitigation (404)
- USDA’s Rural Water and Waste Disposal Program Account for grants to repair drinking water systems and sewer and solid waste disposal systems impacted by HIM.
- EDA Programs (Grants and Loans)
- **\$1.8B** - HUD’s Community Development Fund (CDBG-DR to USVI HFA) for “disaster relief, long-term recovery, restoration of infrastructure and housing, economic revitalization, and mitigation in the most impacted and distressed areas”

Disaster Relief Requests:
USVI = ~\$7.5 Billion

Disaster Debris Recovery T



Disaster Debris Planning Efforts



PLANNING FOR NATURAL DISASTER DEBRIS

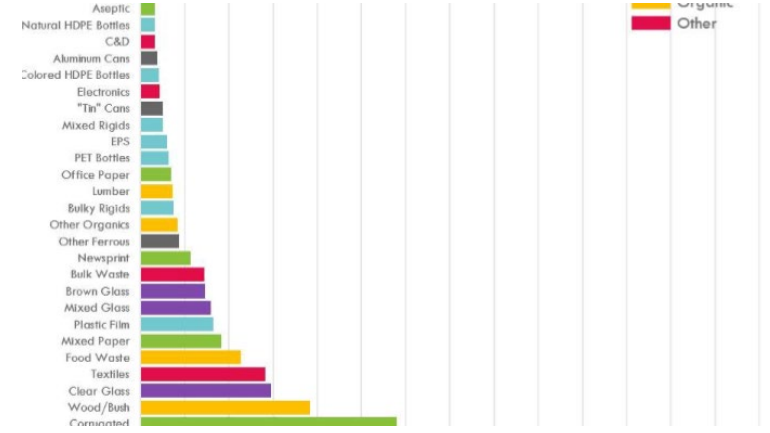


April 2019
EPA 600/R-19-001



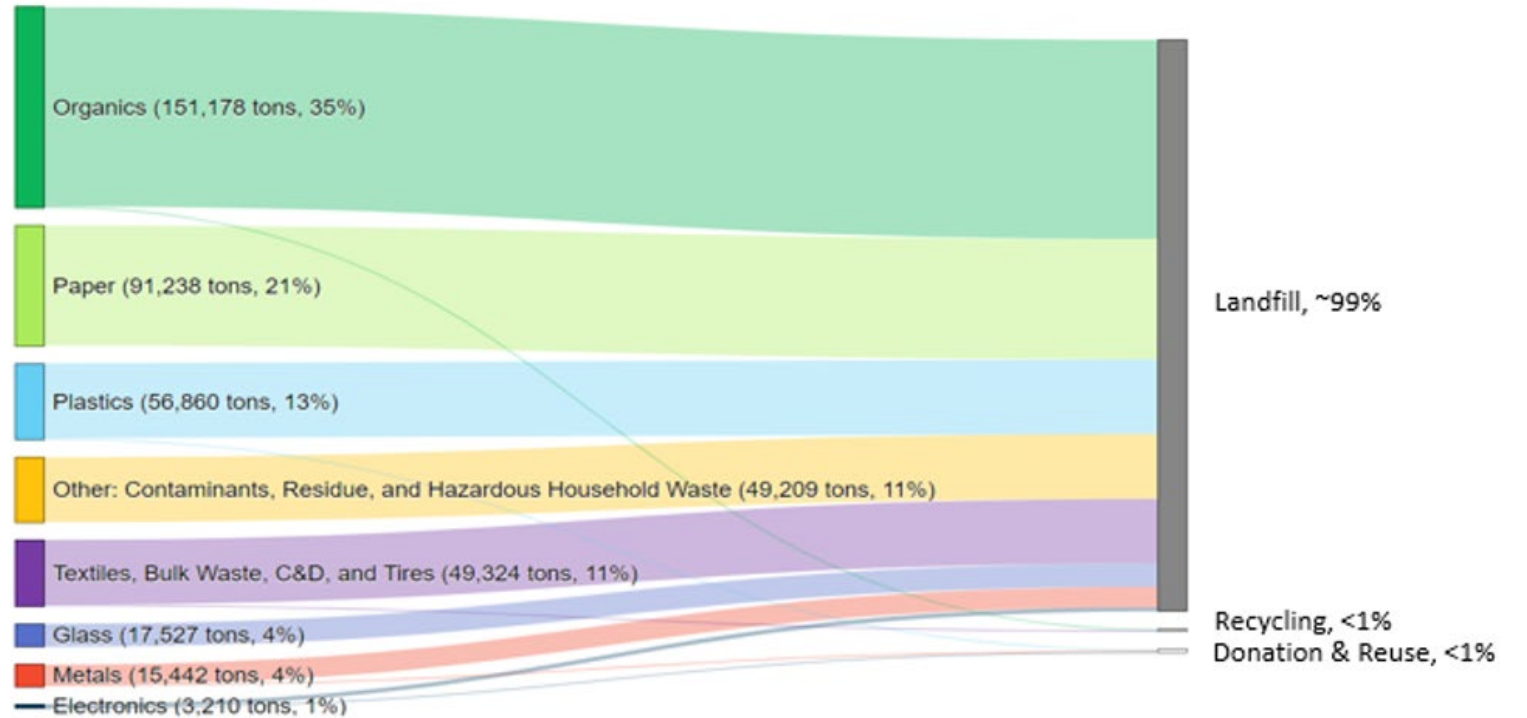
U.S. Virgin Islands 2019 Residential Waste Characterization

DRAFT



VI Waste Characterization Study 2019

USVI SMM Analysis

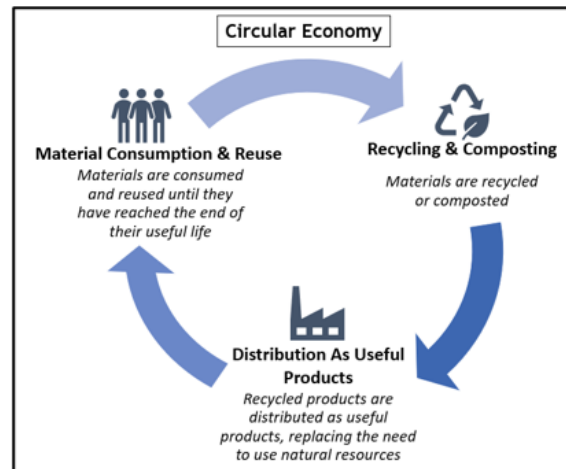
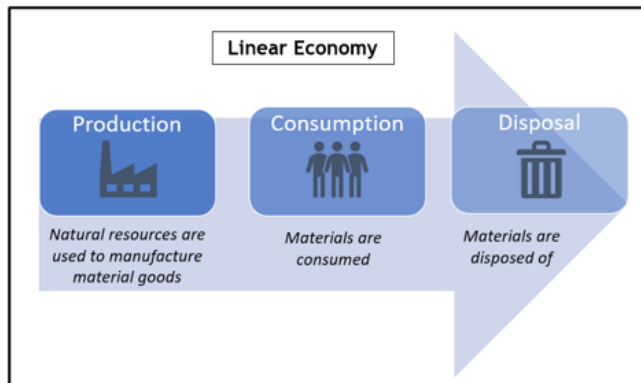


- **How can we capture these resources which are valuable commodities that can preserve resources, create green jobs, and help build resilience and sustainability?**

MATERIALS MANAGEMENT APPROACH	ALIGNED POLICY/PROGRAM APPROACH	MATERIAL STREAMS ADDRESSED	LAND REQUIREMENTS	HEAVY EQUIPMENT REQUIREMENTS	RESILIENCE REQUIREMENTS	JOBS CREATED	CAPITAL COSTS	OPERATING/ MAINTENANCE COSTS	EFFECTS ON IMPORT COSTS	EFFECTS ON EXPORT COSTS
Organics and Paper Composting	Organics landfill ban	Organic materials (yard waste, clean wood, food) and paper	Relatively flat land spanning 2 acres to 13 acres	<ul style="list-style-type: none"> • Garbage/dump trucks to collect organic materials • Brush chipper or a tub grinder to break up waste (e.g., disaster debris) • Magnet and screens • Water source • Front-end loader, bulldozer, compost turner; or composting vessel; or perforated pipe 	Compost areas should be located at least one foot above seasonal high-water table and 100 feet away from residences and businesses or fencing build around it to protect composting vessels from flying debris	70 jobs (e.g., skilled equipment operators for windrow turners, front-end loaders, and grinders)	Ranges from \$300,000 to \$600,000	Ranges from \$50,000 to \$225,000 annually	USVI farms spend \$93,000 of fertilizer annually; assuming at least a share of this is imported, domestic composting could offset this cost	Exporting organics for landfilling could cost \$16.8 million annually

USVI SMM Analysis

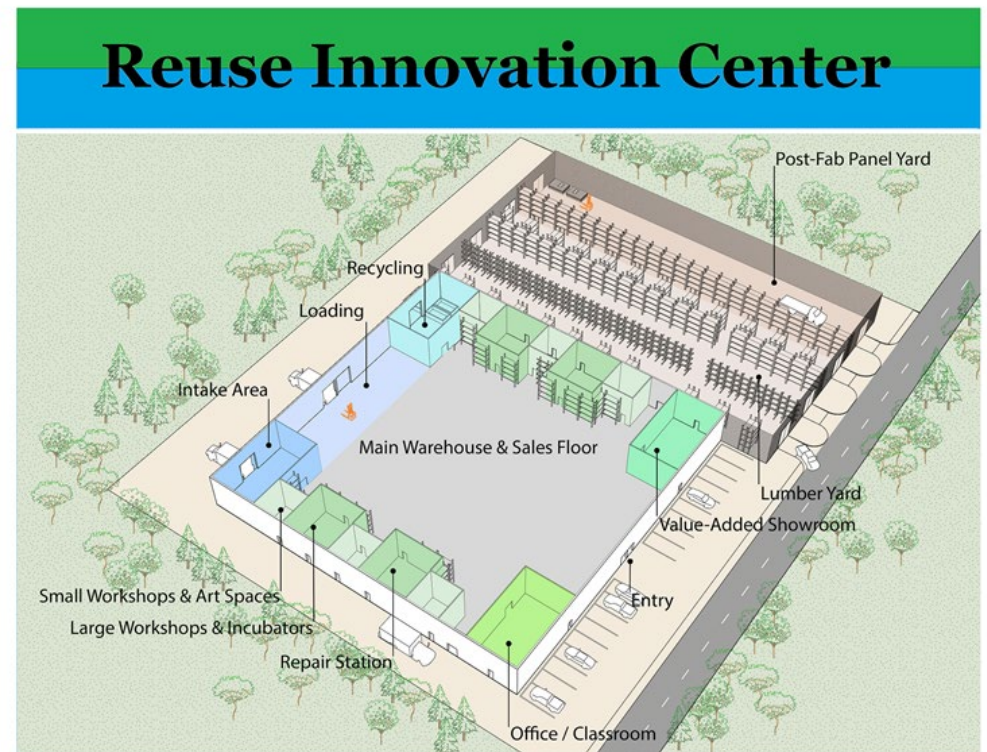
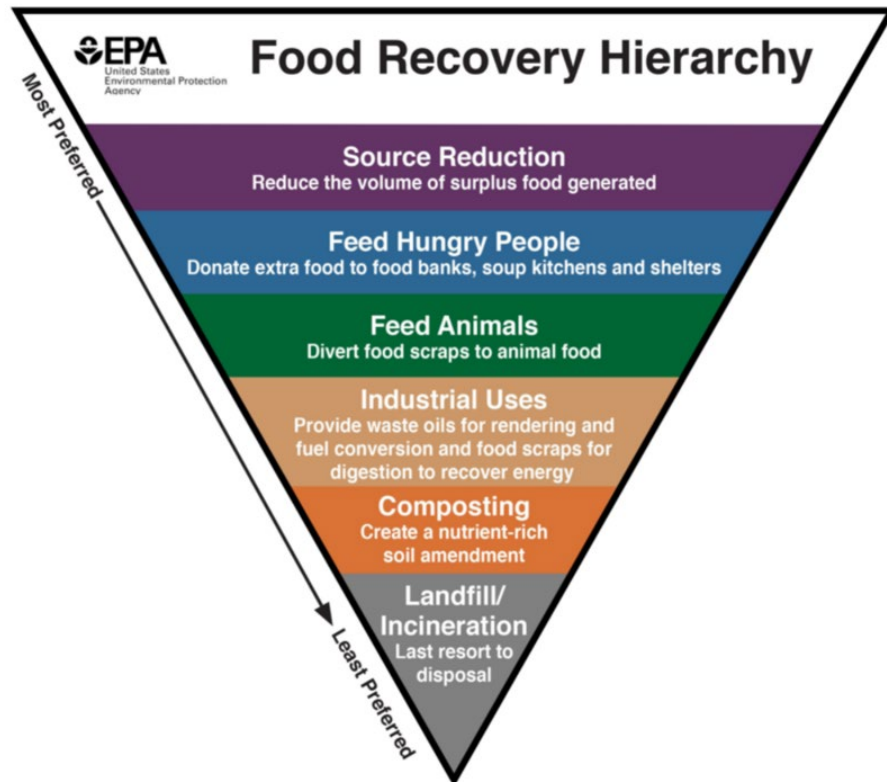
USVI SMM Analysis



MATERIAL CONSUMPTION AND REUSE

- Analyze waste diversion opportunities including source reduction and existing and potential markets for reuse, resale, repair, repurposing and recycling in the Virgin Islands and Puerto Rico
- Explores the opportunities for more sustainable market approaches to materials management including cradle to cradle, closed loop, collaborative, lifecycle assessment, circular economy approaches within the Virgin Islands and within the pan Caribbean basin.
- Results of the research shall be used to address human health and environmental concerns in the VI, to help create green jobs and develop a sustainable economy, and to inform an Integrated Sustainable Materials Management Plan for the Territory.

USVI SMM Analysis



Bermuda Island Waste Facilities



GREEN MARKET
SANTA CRUZ, TRINIDAD, W.I.

SWMCOL
THE TRINIDAD AND TOBAGO SOLID WASTE MANAGEMENT COMPANY LIMITED.

Instant Incentive To **RECYCLE**

Energy in Ag and Organic Residuals

Jean Bonhotal
Cornell Waste Management Institute
<http://wami.ces.cornell.edu>



We Recycle | Green VI

we-recycle/

HOME THEMES OUR WORK IWANT TO... ABOUT US

We Recycle

The WE RECYCLE Programme is a collaboration between the Government of the Virgin Islands and Green VI to create the best recycling system for the BVI to protect the environment, our people, create jobs, provide materials for local entrepreneurs to make products and demonstrate best management practices with waste REDUCTION being a key focus.

Kona Staffed Reuse Transfer Station
\$30,000 Construction Cost

2020 Commodities Market Analysis Speaker Series

John Wackman, Founder, HV Repair Café now active in more than 40 communities in 12 counties in the Hudson Valley, Catskills and Capital region. Co-author of Repair Revolution

Cynthia Andela, New York Founder, Owner and President of Andela Glass with clients throughout the Caribbean.

Patrick Villemin, St. Marten, Solid Waste Director

Alan Hunt, Bermuda, Former Wider Caribbean Solid Waste Association/ReCaribe Executive Director

Clarkston Trott, Bermuda Solid Waste Manager

John Harder, Hawaii, Zero Waste Kauai Co-Founder and President, Waste Diversion Analyst-Kauai County, Maui County Solid Waste Director, US Commonwealth of the Northern Mariana Islands Solid Waste Director.

Timonie Hood, USEPA Region 9 Zero Waste Zero Waste and Green Buildings Coordinator with projects in the Pacific Islands

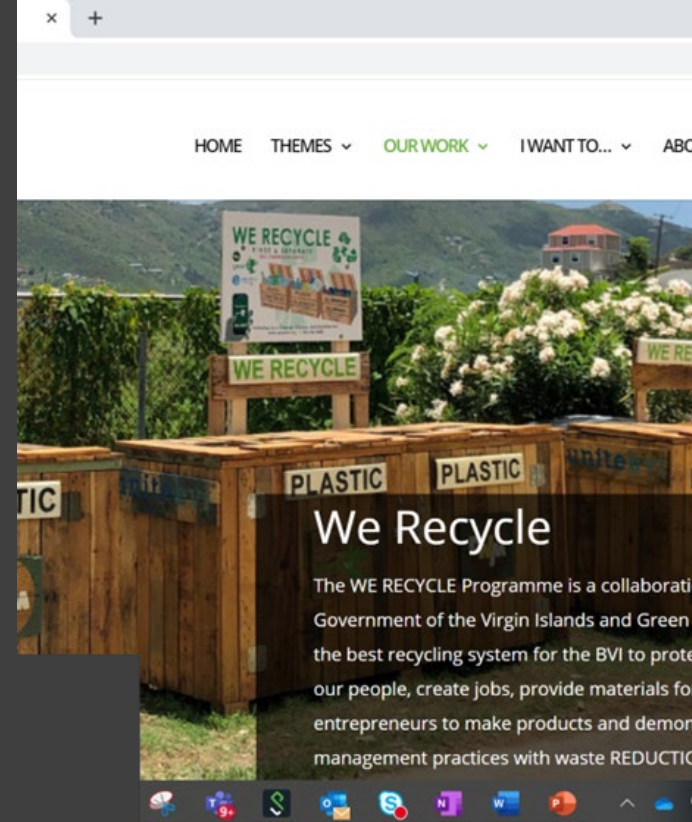
Charlotte McDevitt, British Virgin Islands, Green VI

Edison Garraway, Trinidad and Tobago, Former Solid Waste Manager

Jean Bonhotal, Director, Cornell Waste Management Institute with Projects On Engineering Applications of Compost in British Virgin Islands, Haiti, India and more

Norm Ruttan, President, IWasteNotSystems, Canada

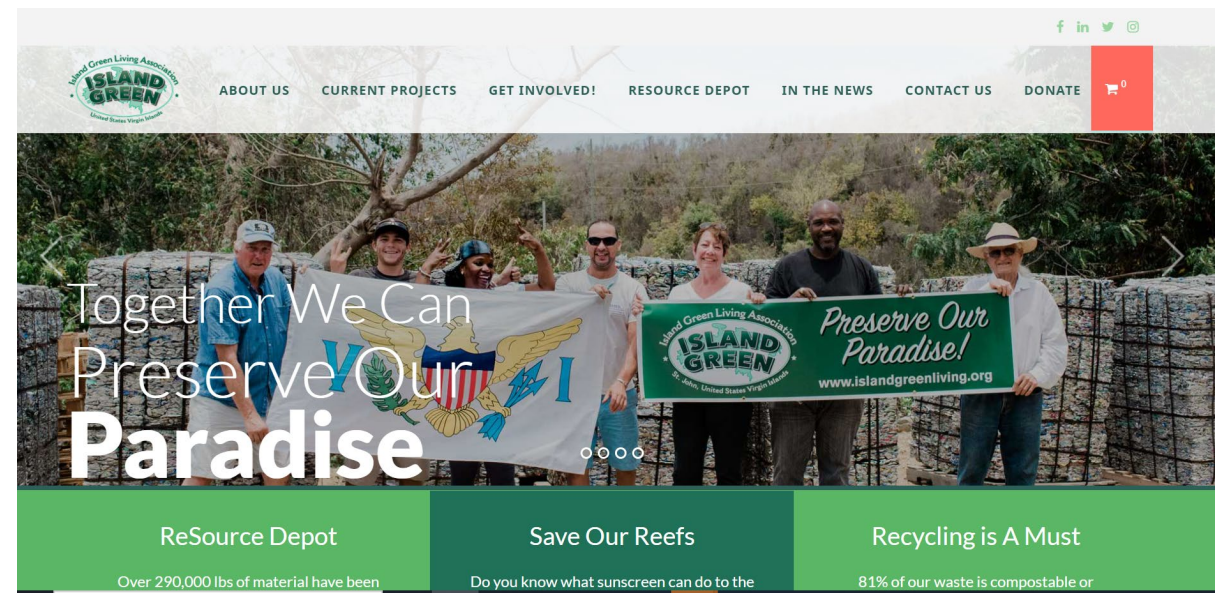
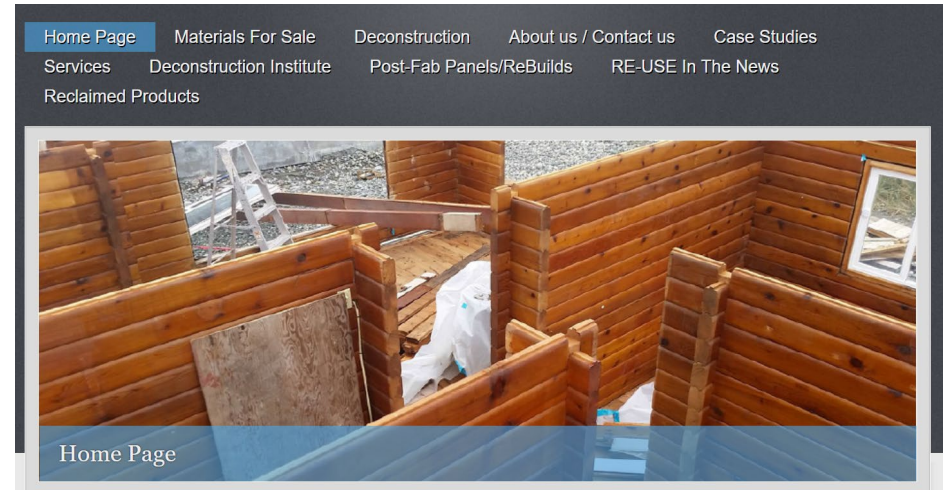
Maryellen Etienne, Reuse International



EPA R2 SMM Grant Award- Island Green Living/Build Reuse

IGL plans to partner with a Master Trainer from the Build Reuse Association, formerly known as the Building Materials Reuse Association, to train local leaders with the following goals:

- Forge an alliance of leaders with solid C&D SMM skills to inform policies and practices in the USVI. These leaders can be deployed when there is a disaster that results in damage to structures to ensure materials are both salvaged and redistributed.
- Develop skills and practices that become the daily practice of SMM for every kind of C&D material.
- Decrease the volume of C&D materials going to the landfill and more resources to be used for conomic and environmental gain.





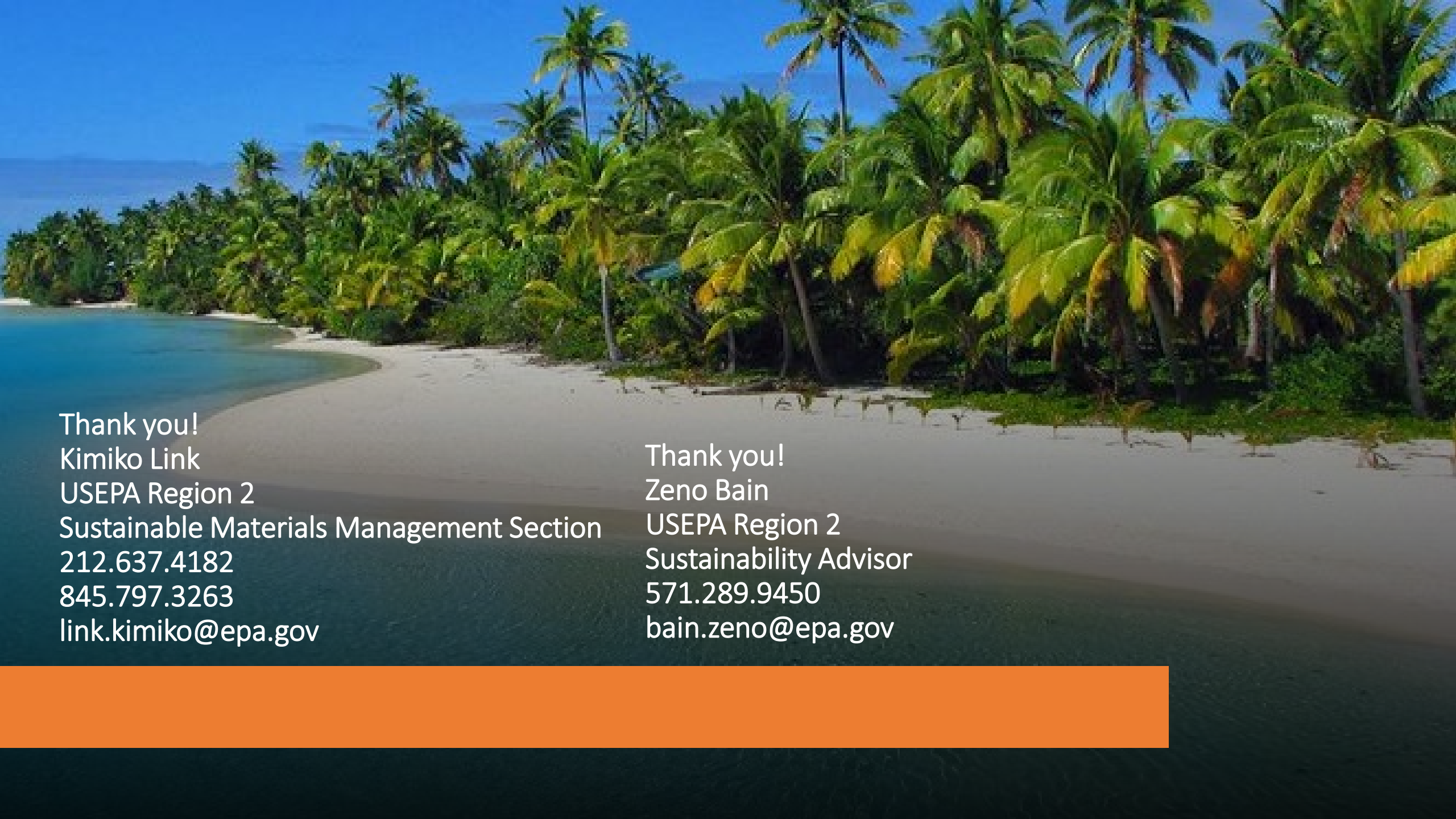
WORKSHOP REPORT

Experts Meeting on Environmentally Sound Technologies for Waste Management in Caribbean SIDS

16-19th December 2003, Rex Papillon Resort, St. Kitts and Nevis



ReCaribe



Thank you!
Kimiko Link
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Sustainable Materials Management Section
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Thank you!
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USEPA Region 2
Sustainability Advisor
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US VIRGIN ISLANDS SOLID & HAZARDOUS WASTE PROGRAM

DPNR-DEP

Austin Callwood
Director

Environmental Protection Division
austin.callwood@dprn.vi.gov
340-774-3320

VI DPNR-DEP

✘ Department of Planning & Natural Resources

- + Provide regulatory environmental oversight to protect human health, environment, and culture

✘ Division of Environmental Protection

- + Regulate Solid and Hazardous Waste Programs
- + Oversee Solid Waste and Sustainable Materials Management (SMM) Programs
- + Responsible for Environmental Monitoring, Compliance and Enforcement

SOLID & HAZARDOUS WASTE PROGRAM

- ✘ 2019 - Delegated authority to operate RCRA Subtitle D Permitting Program
- ✘ 2020 - Received \$10 Million Supplemental Disaster Relief Grant
 - + Bipartisan Congressional Disaster Relief Act
- ✘ Enforce and regulate solid waste management under VI Rules and Regulations Title 19 Chapter 56 Section 1560
- ✘ Conduct compliance inspections at all solid waste disposal sites
 - + Landfills
 - + Temporary Debris Management Areas (TDMA)
 - + Transfer stations
 - + Satellite collection sites (bins)
 - + Convenience centers
 - + Future materials management facilities

\$10M STATE & TRIBAL ASSISTANCE GRANT (STAG)

- × \$4M DPNR:
 - + Hire competent staff (4-technical positions)
 - + Administer and implement workplan
 - + Develop sustainable materials management program
 - + Develop RCRA Subtitle D Permitting Program
 - × New Landfill Permit
 - × Existing/expansion Landfill Permit
 - × Closure of Landfill Permit

 - + Update solid waste regulations and develop SMM & hazardous waste regulations

 - + Support VIWMA development of an Integrated Sustainable Materials Management Plan
 - × Waste diversion programs
 - * Scrap metal
 - * Construction and Demolition
 - * Waste tires
 - * Green Waste

- × \$6M VIWMA – Develop and Implement Sustainable Materials Management Plan

VIRGIN ISLANDS WASTE MANAGEMENT AUTHORITY

Municipal Solid Waste & Wastewater Management

St. Croix | St. Thomas | St. John | Water Island



USVI, VIWMA, DPNR, and EPA Earth Day Webinar

Presented by:

**Alex J. Bruney, P.E.; Senior Staff Engineer
Virgin Islands Waste Management Authority**

**May 5, 2021
St. Thomas, U.S.V.I.**

VIWMA HISTORY



The Virgin Islands Waste Management (VIWMA) was created in January of 2004 as an autonomous non-profit instrumentality of the Government of the Virgin Islands with control over all aspects of waste management, including solid waste, wastewater, residential septic systems.

The new Authority would address the accumulative harmful effects of improper disposal of solid waste, antiquated infrastructure, and the discharge of untreated or partially treated wastewater in the surrounding sea waters.

VIWMA GOALS

- The main goal of the Authority is to advance modern and responsive waste management tactics, designed to bring the Virgin Islands into compliance with local and federal guidelines to protect public health and preserve the environment of the U.S. Virgin Islands.
- VIWMA's Vision is to be the most efficient, effective, and fiscally responsible waste management agency in the Caribbean.
- Core Values: Safety | Regulatory Compliance | Teamwork | Customer Service | Fiscally Responsible



WASTEWATER INFRASTRUCTURE



VIWMA provides wastewater services, including the collection, transportation, treatment, and disposal to approximately 60 percent of the Virgin Islands population. Wastewater is any water contaminated by human use. This liquid may or may not contain solids originating from homes and businesses. If untreated or discharge into the environment, such waste will create a nuisance and serious health hazard for the public.

WASTEWATER INFRASTRUCTURE



- **St. Croix District:**
 - 102 miles of sewer lines
 - Fifteen (15) wastewater facilities
 - Three (3) major pump stations
 - Twelve (12) small pump stations
 - One (1) wastewater treatment plant.

- **St. Thomas & St. John District:**
 - 300 miles of sewer lines
 - Fifteen (15) pump stations
 - Eleven (11) pump stations (St. Thomas)
 - Four (4) pump stations (St. John)
 - Seven (7) wastewater treatment plants
 - Five (5) wastewater treatment (St. Thomas)
 - Two (2) wastewater treatment plants (St. John)



SOLID WASTE INFRASTRUCTURE



- **St. Thomas & St. John District:**
 - Fifty-one (51) bin sites (35 on STT & 16 on STJ)
 - One (1) Convenience Center
 - One (1) Scale House
 - One (1) Gas-energy Building
- **St. Croix District:**
 - Three (3) major bin sites
 - One (1) convenience center
 - One (1) scale house
 - One (1) transfer station



CURRENT SITUATION



- Bovoni Landfill (STT) collects 300 tons daily (including STJ waste).
- 1 Transfer Station – Susannaberg Transfer Station (STJ)
- Anguilla Landfill (STX) collects 200 tons daily.

Collection efforts are completed by in-house VIWMA staff and contracted waste haulers. Capacity and conditions are constantly changing as VIWMA implements waste diversion methods to reduce the volume of waste deposited at the landfill. The more waste diversion the more the landfill lifespan is extended.

PROBLEMATIC MATERIALS



Waste tires, electronic waste, and used oil are all concerning issues within the territory due to a lack of proper disposal by residents.

Although there is a household hazardous waste program in place, where E-waste and used oil are accepted at the landfill, illegal dumping is rampant.

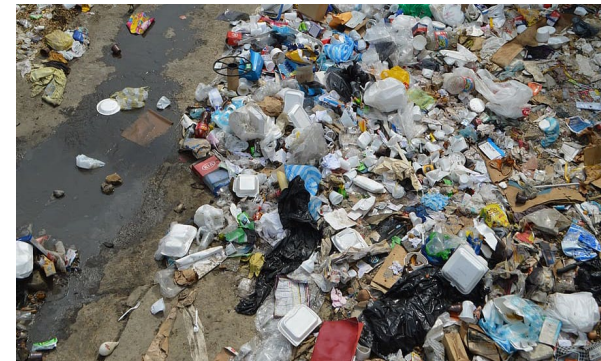
Not being able to allocate stateside partnerships to accept recyclable waste also poses a challenge to the Authority.



PROBLEMATIC MATERIALS

Despite the ban on plastic bags to include disposable, plastic drinking straws and to allow the sale of reusable drinking straws, non-biodegradable single-use plastic bottles and containers continue to add to the landfill's capacity.

Due to COVID, many of the plastic reduction initiatives were suspended, hampering plastic diversion.



INHERITED CHALLENGES



Historical management of waste territory-wide, in terms of waste separation, has continued to be a deterrence. The most difficult challenge with managing the territory's waste is changing the mindset of citizens on source separation, collection, and disposal of municipal solid waste.

Waste diversion programs are beneficial to the community; however, it is accompanied by a financial expense and VIWMA currently does not charge solid waste fees to residents of the territory.

UPCOMING INITIATIVES



Through the CDBG-DR the Authority is receiving \$9 million in grants to construct 5 convenient centers territory-wide (2-STT, 2-STX, 1-STJ).

Long-term, the Authority will develop a composting program for organic and biowaste materials. This high quality biproduct will assist with agriculture development throughout the territory and reduce the amount of organic substances at the landfill.

The territory has received a \$10 million grant from the EPA to implement a waste diversion program. The goal is to create a waste diversion program focusing on scrap metal, used tires, C&D, and green waste.

CONCLUSION

In conclusion, the VIWMA is continuing its preserving paradise efforts, through waste diversion, best practices, and new initiatives.

We are working and partnering with local and federal agencies towards achieving these goals along with educating the public on best practices and the path forward to a cleaner, sustainable, and healthier environment for all.



THANK YOU!

A tropical beach scene with a large palm tree leaning over the water, a clear blue sky with white clouds, and a white sandy beach. The text is overlaid on the water and sand.

Virgin Islands Waste Management Authority
Preserving Paradise

UVI Caribbean Green Technology Center

The mission of the Caribbean Green Technology Center of the University of the Virgin Islands is to **develop, promote** and help **implement** the use of innovative **green technologies** to improve the **social development** of the U.S. Virgin Islands and the **well-being** of all the Territory's **communities**.



CGTC Pillars



Disaster Risk Reduction. We depend on infrastructure systems to provide critical services. CGTC is working to increase the resilience of infrastructure systems to ensure that we receive the services we need in times of major disruptions.



Energy encompasses electricity, transportation, heating and cooking. The CGTC focuses on making energy accessible and affordable to Virgin Islander at all times.



Water and Food Security. While water is abundant, useable water is scarce. CGTC is dedicated to promoting sustainable water management in support of household needs and food production to increase resilience.



Sustainable Materials Management is the systemic approach to using and reusing material more productively over their entire life cycle. CGTC is dedicated to developing the circular economy in the Virgin Islands.

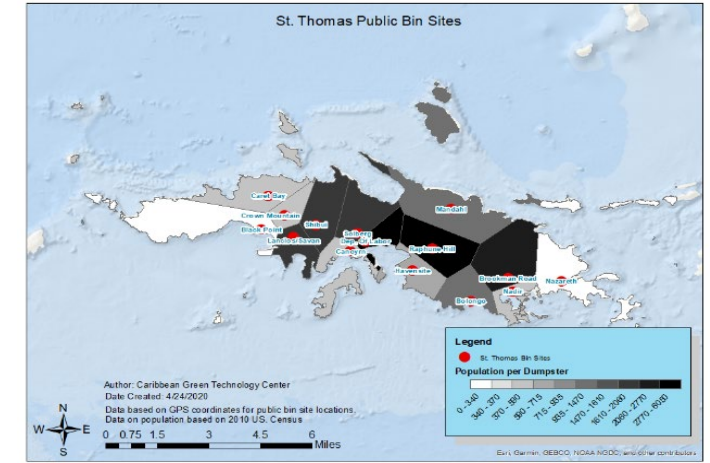
UVI CGTC Collaboration with Government Agencies



Waste Characterization



Student Involvement and
Community Outreach



Data Collection, Research
and USVI Plan Development
& Assistance



VIRGIN ISLANDS OFFICE OF DISASTER RECOVERY



Waste management is an essential service in the aftermath of a disaster and is critical to recovery.



- The update to the Hazard Mitigation Plan does a deep dive into how the system works
- The HMRP includes the system operations and infrastructure of solid waste management as a vital service for disaster recovery and resilience.
- The HMRP will identify opportunities, strategies and recommendations to increase resilience.
- The recommendations in the HMRP increase the USVI's eligibility for funding opportunities.

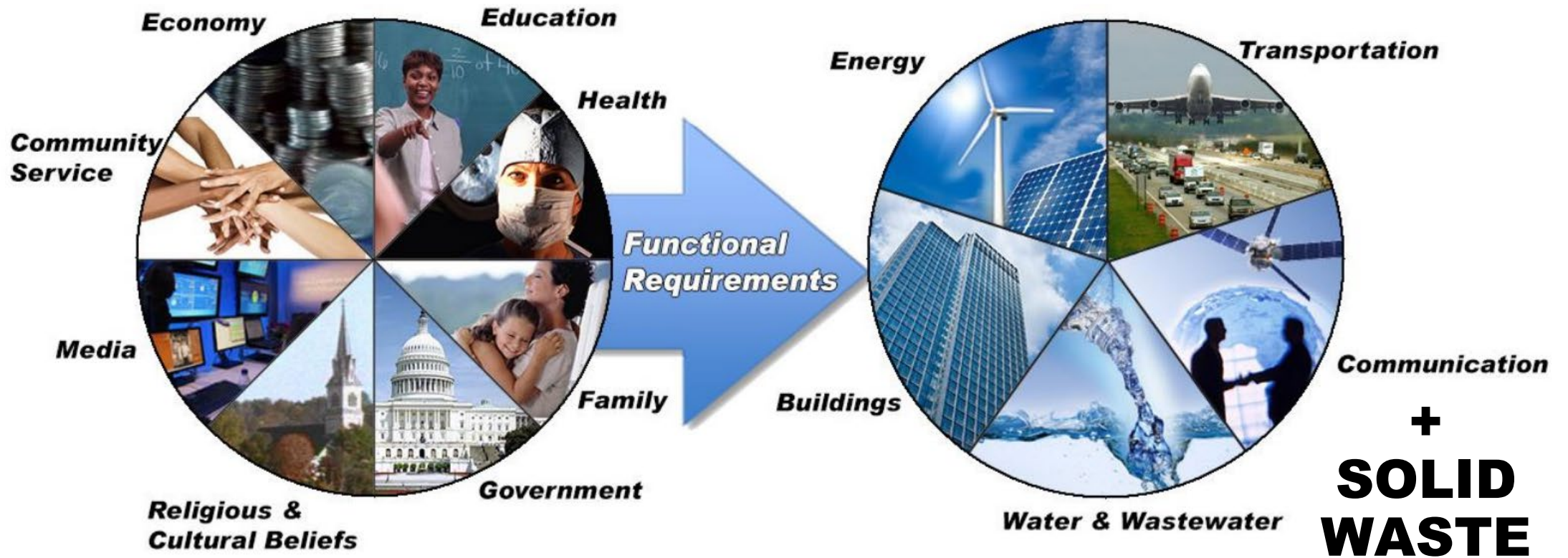
Image: Piles of debris litter St. Thomas in the U.S. Virgin Islands following Hurricanes Irma and Maria in 2017. (Bonnie Jo Mount/The Washington Post) https://www.washingtonpost.com/national/mountains-of-trash-left-behind-by-hurricanes-inflame-debate-in-us-virgin-islands/2018/02/22/30763f0e-1008-11e8-9065-e55346f6de81_story.html


Preliminary Insights from HMRP on Solid Waste Based on Stakeholder Interviews

- During a hazard event solid waste infrastructure can be compromised but a main challenge is managing and disposing of excess debris generated by the event
- VIWMA has difficulty planning for these events because solid waste is often not prioritized across USVI agencies resulting in underfunding, understaffing, and difficulty managing assets due to dependency on contractors
- Solid waste under normal conditions is a challenging issue worldwide, but it is even harder for isolated small islands which are unable to capitalize on economies of scale. The need for redundancy on each island and expensive transportation complicates matters.
- It is difficult for VIWMA to generate revenue because waste disposal has been a free service historically. However, it is incredibly expensive to maintain and manage especially if adhering to environmental regulations.
- Among grassroots efforts there is an inherent lack of coherence, and many projects are not sustainable over time because of dependence on volunteers and temporary funding sources. The public may also find it hard to get reliable information on these efforts. Additionally, projects are often too small for the enormity of the issue.

Island System Resilience

Systems are complex, inter-connected and inter-dependent.
If one **fails**, the effects can cascade to other sectors.



An illustration showing several hands of different skin tones reaching towards the center, each holding a piece of a puzzle. The puzzle pieces are in various colors including yellow, blue, pink, and orange. The hands are arranged in a circular pattern, suggesting collaboration and teamwork.

Islands Systems Resilience Thinking

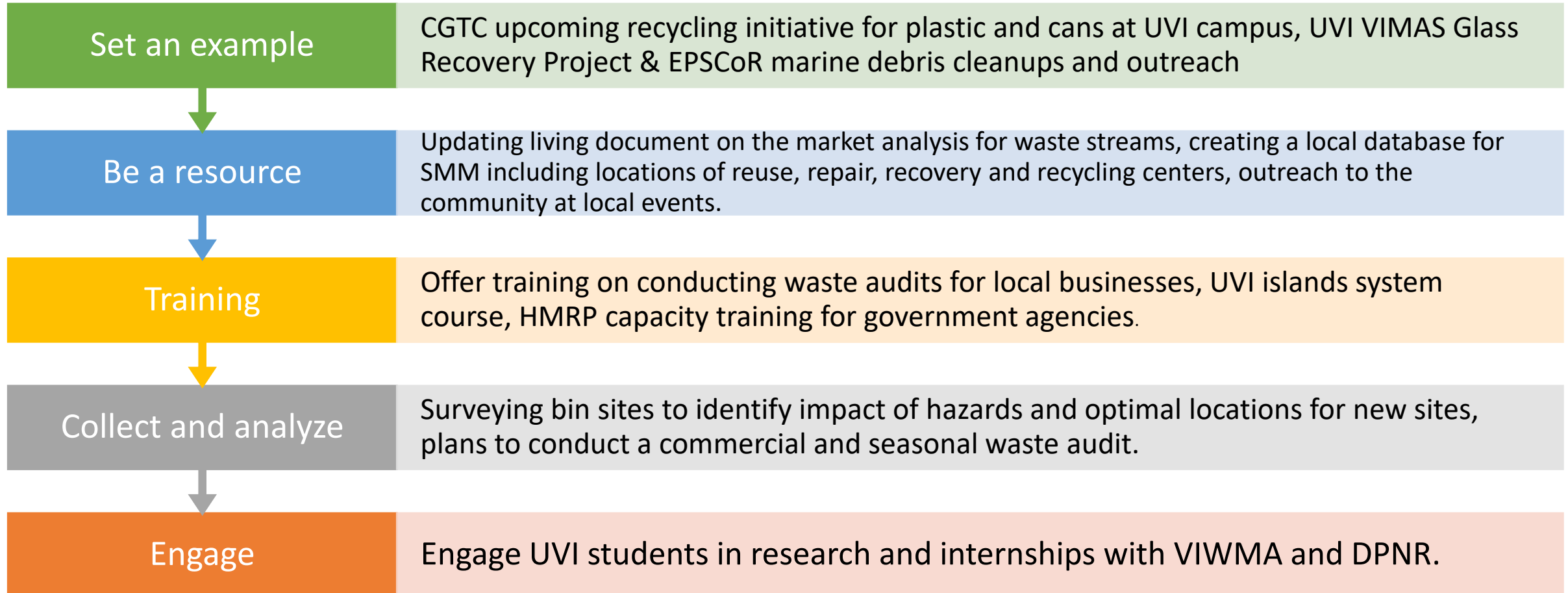
Traditionally, most agencies have been encouraged to work in silos.

Collaboration and cooperation is necessary as technology changes our environment, external pressures shock and surprise us, and systems become more **complex**.

UVI is creating a certificate to train the next generation of VI system operators to understand system resilience engineering.

**Island Systems
Resilience Courses
Coming soon to UVI
in Spring 2022**

UVI's & CGTC's plans for a continued role in the future of Sustainable Materials Management



Thank You!



Ariel Stolz

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Caribbean Green Technology Center

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Linkedin: <https://www.linkedin.com/in/ariel-stolz/>





Main Takeaways

- Solid Waste is a challenge
 - VIWMA and DPNR are working diligently to develop solutions
 - Community participation is necessary because you are part of the system too
- 

Thank you
Q&A

