

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Climate Change: Natural Resources and Environmental Management Program

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	35%			
123	Management and Sustainability of Forest Resources	35%			
134	Outdoor Recreation	20%			
136	Conservation of Biological Diversity	10%			
	Total	100%			

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	2.8	0.0	0.0	0.0
Actual Paid Professional	2.8	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
80000	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
63519	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Continue participation with the development and implementation of environmental management master plans for Magens Bay, Estate Adventure Trail, and Great Pond Park recreation areas and a Magens Bay watershed advisory committee. Habitat protection and restoration plans/procedures will also be used to restore and/or protect other critical habitats, areas of particular concern in the territory, and areas designated as part of the VI Territorial Park initiative established by the Legislature of the VI in 2004.
- Develop resource conservation education outreach materials to engage the islands' growing immigrant populations and disseminate materials and information utilizing an innovative approach that incorporates and builds upon indigenous knowledge and practices.
- Develop websites, educational materials, workshops, presentations and demonstrations (informal learning sites) that relay information regarding native plants, ecosystems and habitats; naturalized, exotic, endangered and threatened plant species; urban forestry and other resource conservation issues.
- Utilize the media to promote Natural Resources programs through various methods, including, but not limited to, radio and television PSAs, television video spots, E-education, local talk shows (radio & TV), and presentations.
- Identify and/or develop technical materials related to resource conservation; pollution control practices; and native, medicinal, naturalized, exotic, endangered and threatened plant species for use by researchers, policymakers and regulatory personnel.
- Provide technical assistance on a variety of topics, including but not limited to, plant identification, selection and maintenance; native, naturalized, exotic, endangered and threatened plant species; natural products development, environmental assessment; ecotourism development and other resource conservation issues to government agencies, community groups, various areas of the private sector, students and the general public.
- Play a lead role in facilitating the interaction of community groups and leaders to address natural resource conservation and management issues, as well as pollution control and prevention.
- Conduct ecotours for local schools and groups (mostly on St. Croix) to stimulate interest in careers in science, ecotourism or environmental management and to provide students and others with a general introduction to VI natural and cultural resources.

2. Brief description of the target audience

- Policymakers and regulatory personnel, community groups, teachers and students, business community, non-governmental organizations, and the general public.
- Those charged with managing public recreation areas including the Magens Bay Authority, VI Territorial Park Advisory Committee, St. Croix East End Marine Park Committee, and Great Pond Park.
- Local environmental associations and Rotary Clubs that engage in activities to conserve and manage the VI environment.
- Immigrant populations whose practices (land clearing techniques, littering, etc.) negatively impact

VI natural resources. Efforts will be made to identify contacts.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	300	500	120	600

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Education/Classes in natural resources management, VI forest ecosystems

Year	Actual
2013	10

Output #2

Output Measure

- Workshops -VI forests, medical plants, environmental landscaping, watershed awareness, VI cultural and natural history, ecotourism, in-door air quality

Year	Actual
2013	7

Output #3

Output Measure

- One on One consultation with residents, government employees, students

Year	Actual
2013	160

Output #4

Output Measure

- Tours of VI natural areas for students and community groups

Year	Actual
2013	5

Output #5

Output Measure

- E-education - NREM websites updated

Year	Actual
2013	1

Output #6

Output Measure

- Publications, articles, posters related to natural resources and environmental management

Year	Actual
2013	5

Output #7

Output Measure

- Demonstration site relating to native plants, environmental management

Year	Actual
2013	4

Output #8

Output Measure

- PSA's

Year	Actual
2013	0

Output #9

Output Measure

- Fairs

Year	Actual
2013	3

Output #10

Output Measure

- TV/Media

Year	Actual
2013	143

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	The recommended BMP's in environmental management master plans will be adopted by one natural resource manager annually. Successful plans will be used as prototypes for other critical habitats, parks and areas designated as part of the VI Territorial Park.
2	After attending non-formal education programs, the number of people who adopt recommended landscaping practices, incorporate native plants into their landscapes, protect and/or enhance soil resources for agriculture, construction, and landscaping will increase by 30%
3	As a result of direct and indirect contacts the number of adults and students who adopt practices that protect native plants and their habitats because of their increased understanding of the human effects on native ecosystems will increase by 200
4	Increase the number of stakeholders (government personnel, developers, community groups and students) who became more aware of the connections between terrestrial and marine communities, how watersheds function, and the importance of watershed protection by 500.
5	Based upon watershed research, the number of projects within targeted watersheds which protect water quality will increase by one, annually.
6	The number of Virgin Islands youth who increase their awareness of VI natural and cultural resources, and careers in environmental management and ecotourism will increase annually by 300

Outcome #1

1. Outcome Measures

The recommended BMP's in environmental management master plans will be adopted by one natural resource manager annually. Successful plans will be used as prototypes for other critical habitats, parks and areas designated as part of the VI Territorial Park.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Magens Bay Authority and other local government agencies, Forest Stewardship Advisory Committee (U.S. Dept. of Forestry), St. Croix Environmental Assoc. and the Nature Conservancy (NGOs), or private landowners with conservation areas who manage natural areas but are limited in their management resources. Hotel managers and developers are also responsible for implementing sound environmental management practices to protect their properties and critical natural resource habitats.

What has been done

CES helped partners (Magens Bay Authority, VI Department of Agriculture, St. Thomas Humane Society, Rotary Clubs, My Brothers' Table) develop natural resource management plans related to landscaping with native plants and preserving native plant communities. CES provided requested information to CZM permit applicants about landscape management plans, and contributed to several Forest Stewardship Program management plans that landowners (3+ acres) are required to follow to receive program benefits.

Results

CZM major permit applicants included recommendations by CES in landscape plans. As a VI Dept. of Agriculture Forest Stewardship Program member, CES approved a master plan (i.e. native forest conservation) included in the purchase agreement of a large St. Croix conservation property through the Forest Legacy Program. Landowners enrolled in the Forest Stewardship Program followed master plans approved by CES. CES provided technical assistance to Rotary Clubs and My Brothers' Table (apprentice program for "youth at risk") related to restoring and establishing native plant communities in parks and school campuses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
134	Outdoor Recreation
136	Conservation of Biological Diversity

Outcome #2

1. Outcome Measures

After attending non-formal education programs, the number of people who adopt recommended landscaping practices, incorporate native plants into their landscapes, protect and/or enhance soil resources for agriculture, construction, and landscaping will increase by 30%

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	55

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Developers, engineers, architects, environmental groups, resource managers, businesses and property owners requested technical information to protect landscapes and the environment, comply with the VI government permitting requirements for earth-change operations and construction or to develop urban landscape plans.

What has been done

Through phone/office consultations, publications, site visits, volunteer training, web outreach, and e-education, CES provided clients with information about native plants in various ways including: conservation, environmental landscaping, plant identification, plant uses, forest conservation, plant selection for urban forests and erosion control. CES increased collaboration with professionals involved with developing plans and outreach programs to introduce native plants into urban and park landscapes.

Results

DPNR personnel (CZM, DFW, and Permits) referred permit applicants to CES for assistance with identifying and preserving native plant communities on construction sites, as a result, applicants selected native trees for projects. CES convinced several individual landowners to preserve or cultivate native plants. The VI Environmental Associations and Rotary Clubs utilized CES

strategies for protecting and planting native plants on public properties. Landscape architects and businesses were assisted with developing lists of suitable native plants for landscaping public planting projects including the landscape restoration of Charlotte Amalie.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
136	Conservation of Biological Diversity

Outcome #3

1. Outcome Measures

As a result of direct and indirect contacts the number of adults and students who adopt practices that protect native plants and their habitats because of their increased understanding of the human effects on native ecosystems will increase by 200

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many educators, resource managers, students, environmental groups, developers, environmental professionals, architects, engineers and the general public want to increase their understanding of V.I. native plants/natural ecosystems and the effects of human alterations to natural ecosystems.

What has been done

CES delivered information to students, landowners and advisory committees about how humans impact native plant habitats. Tours were conducted to evaluate human impacts on native plant ecosystems, and CES is developing a website on native plants and their uses.

Results

CES trained UVI students to manage plant specimens in the CES Herbarium, develop plant databases and create educational webpages focusing on VI native flora. Ethnobotanical information derived from the herbarium collections is now available on a CCAM-CES website.VI 6-12 grade

teachers continue to utilize materials about VI native flora originally developed by CES. The UVI Master of Environmental Science Program and Yale University used the CDC-CES book, Island Peak to Coral Reef, and it was recommended by tour companies and the VI National Park. As a result of CES site visits, phone and office consultations, clients indicated that their awareness of the issues affecting terrestrial resources increased along with developers NREM information about VI native plants useful for landscaping. UVI faculty recruited NREM staff to help design activities related to VI native plants for the Plant Biology classes; resulting in a website designed by students about campus native plants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
136	Conservation of Biological Diversity

Outcome #4

1. Outcome Measures

Increase the number of stakeholders (government personnel, developers, community groups and students) who became more aware of the connections between terrestrial and marine communities, how watersheds function, and the importance of watershed protection by 500.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Stakeholders (government personnel, developers, community groups, resource managers, educators, students) requested information about the connections between terrestrial and marine communities and watershed protection. Reasons for requests included: concern about environmental degradation, environment management in Territorial Parks, protection of coastal resources on hotel and private properties, DPNR requirements that permit applicants consult CES for technical information, class assignments.

What has been done

CES delivered information about watershed protection through partnerships with: VI Forest Stewardship Program, school & community groups, beach managers, UVI science faculty and

environmental management masters program, Yale University Watershed Management Program, My Brothers' Table (vocational training), and developers. Contacts were made during site visits, informal meetings, field trips, advisory committee participation, phone consultations and publication distribution.

Results

Through regular contacts with stakeholders involved with coastal resources, CES learned about local resource management issues and possible land-based sources of impacts to coastal water. CES management recommendations to address these issues were followed by resource managers or stakeholders. Watershed information shared with working groups, students, resource managers (Magens Bay Authority, Lindberg Bay concessions/stakeholders) was incorporated into management strategies or research activities. As member of the VI Forest Stewardship and Forest Legacy Program committees, CES participated in the development of long-range strategies to purchase and conserve VI priority watersheds and watershed management plans adopted by private property owners enrolled in programs. CES exhibits informed the public about the usefulness of key coastal and mangrove plants within a watershed context.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
136	Conservation of Biological Diversity

Outcome #5

1. Outcome Measures

Based upon watershed research, the number of projects within targeted watersheds which protect water quality will increase by one, annually.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Those directly and indirectly responsible for watershed management (Magens Bay Authority, National Park Service, UVI, Governmental agencies, property owners, NGOs) require research-based information to be able to make the best decisions regarding watershed protection.

What has been done

CES continued to provide technical assistance to the Yale U. School of Coastal and Watershed Management graduate program, and UVI environmental management graduate students who are investigating VI watershed management issues and conducting long-term monitoring of VI guts and mangroves. CES research related to VI native plants in specific habitats enabled environmental associations and resource managers to select the best trees to plant in coastal parks.

Results

Recent research-based products developed with CES input have provided resource specialists and managers with useful data on which to base management decisions and planning. Serving as an advisor to a UVI Master of Marine and Environmental Management graduate student, NREM staff assisted with the development of a research project investigating the effects of human impacts on St. Thomas mangrove plants including possible implications for future mangrove resource management. Native trees continued to be successfully planted in coastal VI territorial park and on construction sites near coastal areas to help filter stormwater runoff.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management

Outcome #6

1. Outcome Measures

The number of Virgin Islands youth who increase their awareness of VI natural and cultural resources, and careers in environmental management and ecotourism will increase annually by 300

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1035

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The VI has an economy based on tourism attracted by the natural and cultural resources and scenic beauty of the islands. Both residents and tourists rely on the high-quality presentation and maintenance of these valuable resources to preserve the economy, standard of living and the environment. VI residents, especially VI youth, need guidance into interesting careers in the local economy that support environmental management and protection.

What has been done

CES continued to provide St. Thomas cab drivers/tour operators and other vendors with information about Virgin Islands natural resources to be used in educational tours conducted for tourists and local school students. VI tour company websites advertised and recommended CES natural resource publications. CES continued to provide developers of ecotourism destinations with information about the value of preserving and featuring natural habitats. CES assisted with conserving VI properties suitable for ecotourism.

Results

Taxi tour directors incorporated CES information into their tours and continued to indicate that the information provided by CES improved the educational value of their tours. The developers of a St. Thomas cultural and natural history park and wildlife petting zoo continued to follow CES's recommendations regarding the use of native plants in the landscape. CES publications about native plants and ecosystems were used and promoted by VI tour companies. Through its involvement with the Forest Stewardship and Forest Legacy Programs, CES helped preserve Forests and cultural features on St. Croix properties with ecotourism potential. The VI Economic Development Agency, the State Historic Preservation Society, local businesses and landscape architects were provided with technical assistance with developing a plan to restore areas of natural (native plant) landscapes in Charlotte Amalie with the goal of increasing the town's attraction as an ecotourism destination.

4. Associated Knowledge Areas

KA Code	Knowledge Area
134	Outdoor Recreation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

CES maintained good relationships with staff in various VI governmental regulatory agencies that affect VI natural resources management including the VI Dept. of Planning and Natural Resources, Waste Management Authority, the VI Dept. of Agriculture and the Environmental Protection Agency. There is a high amount of turnover in the VI government agencies and recent economic recession continue to affect and slow VI government

regulatory environmental policy-making and enforcement. Consequently, it is difficult to establish very effective long-term relationships that can result in policy changes and training. Also, many of the employees in these agencies acknowledge the need for more comprehensive enforcement of environmental laws, but they are already overextended and need additional staff support to effectively enforce existing regulations, or they may be experiencing resistance to change at the legislative level. Recent governmental fiscal cutbacks restrict hiring staff. Some employees are hesitant about enforcing environmental regulations because of various political pressures.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Clients responded favorably to the informal evaluation methods used by CES, especially in-person, one-on-one conversations. Clients and viewers verbally indicated interest and approval after NREM presentations or media appearances. Standard evaluation forms are used during workshops and training programs, and Research project reports were peer-reviewed. UVI students and faculty involved with CES in environmental research projects have indicated that they value CES's guidance and technical assistance; they also indicate that they wish to continue partnering with CES on new projects.

Key Items of Evaluation

All key items of evaluation were used.