

**V(A). Planned Program (Summary)**

**Program # 8**

**1. Name of the Planned Program**

Plants & Plant Products

**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			15%	
133	Pollution Prevention and Mitigation			25%	
136	Conservation of Biological Diversity			10%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants			50%	
	<b>Total</b>			100%	

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.3	0.0
Actual	0.0	0.0	0.4	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
0	0	50699	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	62337	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**

Light and temperature treatments were imposed on mature sunflower leaves, and cell and anatomical structural changes were compared to control plants.

Historical comparisons of seaweed populations from the late 1800s-early 1900s to the present day were made to assess the impacts of introduced and altered floras at specific locations. Rapid assessment studies of fouling populations were made between Downeast Maine and New York in order to document floristic changes, numbers of introduced taxa, and the results of anthropogenic impacts. Molecular studies clarifying "cryptic" introduced species were conducted to document patterns of introductions within this geography. Dissemination of results occurred via scientific publications, presentation of significant findings to coastal resource managers, and interactions with diverse conservation units.

**2. Brief description of the target audience**

The target audience for this program area includes scientists studying or interested in stress responses in plants, plant breeders interested in extending temperature tolerance ranges through breeding or molecular biological manipulation, and coastal zone managers (e.g. Fish and Game and Environmental Protection units) charged with protection of coastal resources.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	400	1500	10	0
<b>Actual</b>	35	150	0	0

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

**Patent Applications Submitted**

Year: 2010  
 Plan: 0  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
<b>Plan</b>	0	5	

<b>Actual</b>	0	4	0
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**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of participants directly involved in the project (not including audience counts, workshop participants, survey respondents, etc)  
Not reporting on this Output for this Annual Report

**Output #2**

**Output Measure**

- Number of undergraduate students directly involved in the projects

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	5	13

**Output #3**

**Output Measure**

- Number of graduate student directly involved in the projects

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	5	6

**Output #4**

**Output Measure**

- Number of non-peer-reviewed publications (theses, abstracts, newsletters, fact sheets, articles, etc)  
Not reporting on this Output for this Annual Report

**Output #5**

**Output Measure**

- Number of websites in which project results have been incorporated  
Not reporting on this Output for this Annual Report

**Output #6**

**Output Measure**

- Number of peer-reviewed publications  
Not reporting on this Output for this Annual Report

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of graduate students involved and trained
2	Number of undergraduate students involved and trained
3	Increase in knowledge to publications and other means
4	Increased knowledge about changes in marine seaweed presence along the northeast coast, including those introduced by humans.

**Outcome #1**

**1. Outcome Measures**

Number of graduate students involved and trained

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

Number of undergraduate students involved and trained

Not Reporting on this Outcome Measure

**Outcome #3**

**1. Outcome Measures**

Increase in knowledge to publications and other means

Not Reporting on this Outcome Measure

**Outcome #4**

**1. Outcome Measures**

Increased knowledge about changes in marine seaweed presence along the northeast coast, including those introduced by humans.

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	2010

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The documentation of historical and recent floristic changes and species composition is of critical importance in characterizing long term changes such as global warming and more recent anthropogenic impacts to our critically important coastal and estuarine habitats, with the latter in particular providing important habitat for many commercially important fish, shellfish and crustaceans.

**What has been done**

Rapid assessment surveys between New York and Downeast Maine showed seven introduced taxa, with four originating from Asia, two from Europe and one from the Pacific Northwest. Many of these taxa were introduced via human-mediated vectors, including shellfish aquaculture and vessels (i.e. on hulls and ballast waters). The abundance of these introduced species was enhanced by eutrophication or increased nutrients. Molecular studies documented the occurrence of several ?cryptic? or inconspicuous introduced seaweeds, including the Asiatic green alga *Ulva pertusa* and the red seaweed *Gracilaria vermiculophylla*. Historical comparison across 100-years in Casco Bay, Maine evaluated seaweed similarity.

**Results**

The information is available to scientists, aquaculture and fisheries producers, local and federal governmental units and conservation organizations to help mitigate impacts to our important coastal and estuarine habitats. The initial sites of an introduced seaweed often suggest a possible vector such as shellfish transfer, major conduits of transport including boats hulls and propellers, canals, etc. Genetic determination of introduced species helps characterize the source and number of introduction events. Enumeration of species composition of ?green tide? nuisance algae will be used to characterize ?stressed? or eutrophic habitats.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
136	Conservation of Biological Diversity

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Other (None)

**Brief Explanation**

Not applicable.

**V(I). Planned Program (Evaluation Studies and Data Collection)**

**1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- During (during program)
- Time series (multiple points before and after program)

**Evaluation Results**

{No Data Entered}

**Key Items of Evaluation**

{No Data Entered}