

IMPLEMENTATION OF THE INLAND BAYS CCMP

The background of the cover is a collage of three images. The top image shows a man in a green shirt and a cap standing in a marsh with tall reeds, surrounded by several children who appear to be participating in an educational activity. The middle image is a close-up of a large blue crab with its claws spread. The bottom image shows a wide view of an inland bay with a blue sky and white clouds.

WORK PLAN FOR THE PERIOD
OCTOBER 1, 2009 - SEPTEMBER 30, 2010

DELAWARE CENTER FOR
THE INLAND BAYS, INC.

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Implementation of the Delaware Inland Bays CCMP

Abstract

The Delaware Center for the Inland Bays, Inc. will implement the Inland Bays Comprehensive Conservation and Management Plan (CCMP) through a series of new and ongoing projects in FY2010. These projects implement various CCMP Action Plans and Tactics and may include, but are not limited to the following:

NEW (Proposed):

1. Inland Bays CCMP Project Management & Oversight
2. Resource Protection Area and Shallow Area Markings
3. James Farm Kiosk and Educational Signage
4. Inland Bays Aquaculture Charrette
5. Rain Gardens for the Bays
6. Environmental Indicators/State of the Bays Publication

ONGOING (From FY2008 & FY2009 Work Plans):

1. Statistical analysis of environmental indicators with application to Delaware's Inland Bays
2. Eelgrass habitat restoration enhancement in Delaware's Inland Bays
3. Volunteer intensive and representative condition assessment of the bays (VIRCAB)
4. Benthic diatoms as indicators of water quality in Delaware's Inland Bays
5. Eelgrass planting project in Delaware's Inland Bays
6. Continuing Assessment of Sudden Wetland Dieback
7. CIB Environmental Indicators Project
8. Coastal Communities Stormwater Retrofit Initiative
9. Securing Wetland and Riparian Buffer Protection
10. Urban & Community Forestry Program
11. Conservation Easements
12. Water Use Plan Implementation Committee

Preface

This document is written to meet EPA requirements for an annual work plan for award of funds pursuant to Section 320 of the Clean Water Act. This Work Plan serves as an agreement between the Center for the Inland Bays and the U.S. Environmental Protection Agency for work to be carried out during Fiscal Year 2010 (October 1, 2009 through September 30, 2010). The focus of this Work Plan

is the implementation of the Delaware Inland Bays Comprehensive Conservation and Management Plan via research, demonstration, education/outreach, habitat restoration, and public policy activities.

Introduction

Delaware's Inland Bays and their encompassing watershed have been the subject of study since 1969. Since 1988, the Inland Bays have been part of the National Estuary Program, established under the Federal Clean Water Act and administered by the Environmental Protection Agency. This estuary program effort has culminated in a Comprehensive Conservation and Management Plan for the Inland Bays, which is in the implementation phase. To support this implementation effort and to ensure that an open and collaborative process continues for future conservation efforts in the watershed, the Center for the Inland Bays, Inc. was established by the Delaware General Assembly in 1994 under the auspices of the Inland Bays Watershed Enhancement Act.

The purposes of the Center are:

1. To build, maintain, and foster the partnership among the general public, the private sector, and local, state, and federal governments, which is essential for establishing and sustaining policy, programs, and the political will to preserve and restore the resources of the Inland Bays watershed;
2. To sponsor and support educational activities, restoration efforts, and land acquisition programs that lead to the present and future preservation and enhancement of the Inland Bays watershed; and
3. To serve as a neutral forum where Inland Bays watershed issues may be analyzed and considered for the purposes of providing responsible officials and the public with a basis for making informed decisions concerning the management of the resources of the Inland Bays watershed.

Mission Statement:

The mission of the Center for the Inland Bays is to promote the wise use and enhancement of Delaware's Inland Bays and their watersheds.

2008 Goals and Accomplishments

Achievements

The Center for the Inland Bays engaged in the following research and demonstration projects as identified in the 2008 Work Plan.

1. CCMP Implementation- Project Management and Oversight
2. Continuing Assessment of Sudden Wetland Dieback
3. CIB Environmental Indicators Project
4. Coastal Communities Stormwater Retrofit Initiative
5. Securing Wetland and Riparian Buffer Protection
6. Urban and Community Forestry Program
7. Conservation Easements
8. Community Habitat Enhancement
9. Green Schools Initiative
10. Schoolyard Habitat Program
11. Town Hall Habitat Program
12. Water Use Plan Implementation Committee
13. Annual Inland Bays Cleanup
14. Ingress of larval fishes through Indian River Inlet: Patterns of abundance and development of a Juvenile Fish Index to assess water quality in the Inland Bays system
15. Using cover cropping systems to reduce nutrient losses to the environment
16. Assessment and Monitoring of Harmful Algal Cysts in High Nutrient-Rich Areas of the Delaware Inland Bays

DELAWARE



CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Inland Bays CCMP Project Management & Oversight

Responsible Partner Center for the Inland Bays
39375 Inlet Road
Rehoboth Beach, DE 19971
(302) 226-8105
Edward A. Lewandowski, Executive Director
director@inlandbays.org

Grant ID: CE99399009-0-2008

Status: Completed

Project Description

Project Overview

The Center for the Inland Bays, Inc. is an innovative management approach to watershed restoration and protection. Critical to the success of CCMP implementation activities is effective research and demonstration project oversight, grant development and management, contract administration, and coordination with organizations responsible for various work elements as well as tracking and communication of progress. The Board of Directors, the office of the Executive Director and other appropriate staff, will be responsible for these tasks.

The Center for the Inland Bays, Inc. is a unique organization established under the National Estuary Program. The nonprofit Center for the Inland Bays, Inc., enabled under special legislation signed into law in July 1994, sets up governance to oversee implementation of the Inland Bays Comprehensive Conservation and Management Plan.

The CIB is administered by a nine member Board of Directors consisting of the following members: Secretary of the Department of Agriculture, Secretary of Dept of Natural Resources & Environmental Control, a representative from the Sussex Conservation District, the Sussex County Council, a representative from the Sussex County Association of Towns,

the Chair of the Scientific and Technical Advisory Committee, the Chair of the Citizens Advisory Committee, a designee of the President Pro-Tem of the Delaware State Senate, and a designee of the Speaker of Delaware State House of Representatives. The EPA is an Ex-Officio member.

Subelement(s)

Financial Management; Tracking/Reporting; Program Planning and Administration; Outreach and Public Involvement; Research; Assessment and Monitoring; Reporting; Habitat; Water Quality; Living Resources; Healthy Communities; Tools; Training; Direct Assistance

CCMP/Work Plan Goal

Inclusive

Primary Project Deliverables

Milestones

- Secured state funding in the amount of \$270,000 and other match sources to support the Section 320 grant and CIB Work Plan
- Prepared and distributed program updates and associated progress reports to the Board of Directors and Environmental Protection Agency quarterly
- Hired and/or retained appropriate support staff as needed (on-going).
- Monitored budgetary and financial reconciling procedures.
- Provided administrative (meeting arrangements, notifications, minutes, etc) support for the Board of Directors, Scientific and Technical Advisory Committee, Citizen’s Advisory Committee and other CIB committees (on-going).
- Provided communication documents, including the Inland Bays Journal (three times per annum- spring/summer/fall), to public and private groups/individuals, state, county, and local governments.
- Published a CIB annual report and distributed to select audiences, including the Delaware General Assembly, as required by HB540- the Inland Bays Watershed Enhancement Act.
- Facilitated implementation and monitored/tracked the progress of lead agencies responsible for implementation of CCMP tactics (on-going).
- Provided educational programs to schools, homeowners, and other publics to show better management practices within the Inland Bays watershed; methods will include programs, lectures, slide shows, seminars, as well as media interaction (radio, TV, news articles, etc).
- Continued to support the promulgation of Inland Bays Pollution Control Strategy regulations in cooperation with the Delaware Department of Natural Resources & Environmental Control.
- Continued restoration initiatives at the James Farm Ecological Preserve as well as other public and private sites.
- Served on state-wide and regional committees and task-forces to promote sound environmental policies based on best available science.
- Continued oversight and management of the Inland Bays Shellfish Restoration

Program in cooperation with the College of Marine Studies (U.D.) and Delaware State University

- Traveled to national and regional EPA meetings and estuary-related conferences; provided technical assistance to other programs.
- Served in an advisory capacity to elected officials, public policy makers and civic leaders.
- Organized and hosted special events, such as the Governor’s Wade-In, the Native Plant Sale, the Inland Bays Clean-up, and other public outreach activities.
- Augmented the CIB’s membership program and sustain opportunities for volunteer participation.
- Continued to collaborate with the Maryland Coastal Bays Program on the implementation of DAWN (Delmarva Atlantic Watershed Network) to promote regional planning efforts for Delmarva’s coastal Atlantic watersheds.
- Collaborated with the Inland Bays Citizens’ Advisory Committee to expand the activities of its Outreach and Public Policy subcommittees
- Diversified sources of non-federal income to support the CIB’s programs and activities.

Project Financing

Match	
Award: \$270,000	
Description	Expense
State of Delaware Contractual Service	Operations and Maintenance

Project Critical Success Factors

Outcomes
Short-term: N/A
Intermediate: N/A
Long-term: N/A
Changes in pressure targets: N/A

External Factors

Impacts
<p>1. External factors discussion During fiscal year 2008, Section 320 funding was drastically reduced and the Center suspended its grants program. Most of the on-going and new projects were conducted by CIB staff with support from our many partners.</p>
<p>2. CWA Implementation Information The CIB remains active in all areas of Clean Water Act program implementation.</p>

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Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Continuing Assessment of Sudden Wetland Dieback

Responsible Party/Partner Chris Bason
Center for the Inland Bays, Inc.
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Rehoboth Beach, DE 19971
(302) 226-8105
chrisbason@inlandbays.org

Grant ID: CE99399009-0-2008

Status: On-going

Project Description

Project Overview

The Delaware Department of Natural Resources and Environmental Control (DNREC) and the Center for the Inland Bays (CIB) assessed the condition of freshwater nontidal wetlands in the Inland Bays watershed from 2004 to 2006. The goal of this project was to report on the condition of these wetlands across the watershed and identify the stressors that are impacting wetland condition in order to guide wetland protection and restoration activities. Tidal wetlands (meso- to polyhaline tidal fringe) were assessed in 2008 and results will be reported during 2009. CIB assessed the condition of nontidal wetlands in the Inland Bays watershed using a probabilistic sampling design developed by EPA Ecological Monitoring and Assessment Program (EMAP). Wetland loss since European settlement was estimated. Recommendations for wetland restoration and protection were developed based on the data collected.

Subelement(s)

Habitat; Direct Assistance; Assessment & Monitoring; Research; Reporting

CCMP/Work Plan Goal

- ◆ G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat
- ◆ G7: Establish and implement a shoreline protection program which addresses both natural processes and human activities
- ◆ G7A: Develop and implement a no net loss of wetlands policy
- ◆ G7B: Attain maximum wetlands preservation by providing adequate setbacks and buffer zones
- ◆ G7E: Integrate projected sea level rise into shoreline planning and activities

Primary Project Deliverables**Milestones**

- A final report documenting the watershed level condition of the most prevalent freshwater wetland types in the Inland Bays as well as acreage change since settlement and current major stressors
- Recommendations for restoration and protection
- A baseline for which to measure condition changes relevant to existing goals of no net loss of wetland acreage and function and any additional goals yet developed
- Refinement of a rapid wetland assessment method for Delaware
- A peer reviewed journal article
- Numerous presentations to the technical community on general results and sampling design
- Wetland condition information that is being used to develop two environmental indicators- one for freshwater wetland condition and acreage and one for saltmarsh condition and acreage

Project Financing**Match****Award: N/A****Description****Expense****Project Critical Success Factors****Outcomes****Short-term:**

- increased public understanding of the condition of freshwater wetlands and existing acreage

Intermediate:

- increased acceptance towards restoration and protection strategies amongst the

public management agencies and perhaps, the public

- increased communication and understanding of wetland function and advocacy from CIB and its partners for their protection

Long-term:

- a method to effectively track wetland condition over time (10 year assessment return interval)
- long-term data on condition trends and stressors; allows stressor to be focused on and addressed over time

Changes (+/-) in Pressure Targets:

- N/A

External Factors

Impacts

1. External factors discussion

This partnership has continued through development of management recommendations, education and outreach activities, and research on saltmarsh condition, trends, and sudden wetland dieback. The Center's public forums are regularly utilized to effectively transmit the information from this study to the public.

2. CWA Implementation Information

Primary Role: Wetlands restoration and protection

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CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report Executive Summary

Project Name: CIB Environmental Indicators Project

Responsible Party/Partner: Chris Bason
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(302) 226-8105
chrisbason@inlandbays.org

Grant ID: CE99399009-0-2008

Status: On-going

Project Description

Project Overview

The CIB STAC first published an environmental indicators report in 2004. The report received the input of a number of dedicated individuals from multiple groups and is an excellent first iteration of tracking and communicating the overall condition of the Bays. The STAC now aims to update and assess the current environmental indicators, explore the need for and identify new indicators, and develop a strategy to effectively collect and report this information over time to the public and policy makers. This initiative will also include a comprehensive assessment of progress made towards implementing the CCMP. The purpose of this process is to develop the Inland Bays Environmental Indicators into the most complete and coherent explanation of the current ecological condition of the Bays and their watershed, and to relate this to the progress towards their restoration in a manner that regularly informs the public.

Subelement(s)

Habitat; Direct Assistance; Assessment & Monitoring; Research; Reporting

CCMP/Work Plan Goal

- ◆ D6: Issue annual progress report on the Center for the Inland Bays activities
- ◆ CIB C: Issue an annual Inland Bays “Report Card” that reflects progress toward meeting goals of the CCMP – coordinated with the annual report to the Delaware General Assembly
- ◆ G2E: Enhance monitoring and response strategies

Primary Project Deliverables

Milestones

- All data for existing indicators have been updated.
- Certain indicators by their nature have been retired.
- Fifteen new indicators have been proposed and about half of these have had data collected and converted into presentation format.
- A subcommittee devoted to developing a water quality index was developed and the developed index is now being examined for refinement so that it may include two different but complementary data sets.
- Currently funds are being pursued to produce indicator reports for public consumption.
- It is expected that a report of finished indicators will be completed in 2009 and that additional data collection for identified new indicators will begin or be pursued

Project Financing

Match

Award: N/A

Description

Expense

Project Critical Success Factors

Outcomes

Short-term:

- awareness and understanding of the gaps in knowledge and data for effective development of environmental indicators

Intermediate:

- involvement and collaboration within the scientific community to produce an enhanced suite of environmental indicators

Long-term:

- a standard framework for assessing and reporting on the ecological integrity of the Inland Bays estuary and the progress made towards resource restoration

Changes (+/-) in Pressure Targets:

- increase in the number of Inland Bays environmental indicators

External Factors

Impacts

1. External factors discussion

None

2. CWA Implementation Information

Supporting Role: Strengthening Water Quality Standards

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CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report Executive Summary

Project Name: Coastal Communities Stormwater Retrofit Initiative

Responsible Party/Partner: Chris Bason
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39375 Inlet Road
Rehoboth Beach, DE 19971
(302) 226-8105
chrisbason@inlandbays.org

Grant ID: CE99399009-0-2008

Status: On-going

Project Description

Project Overview

The South Bethany project is a pilot that hopes to reduce non-point source pollution by focusing on low-impact design for retrofitting stormwater facilities in an urban area near the Town of South Bethany. This area was developed prior to the State's adoption of stormwater regulations. Pollutants of concern include excess nutrients, sediments, and hydrocarbons entering a dead end lagoon system on the most polluted of the Inland Bays, Little Assawoman. Education, monitoring, watershed assessment and retrofit planning, and finally implementation are occurring in a community based, collaborative fashion. CIB was able to secure 319 funding to purchase, distribute and install rain barrels for residential use in the Town of South Bethany. In addition, a \$35K grant from the Army Corps of Engineers is being utilized to complete a comprehensive evaluation of stormwater challenges and recommendations to address non-point source runoff in the S. Bethany area. Results of the project and lessons learned will be used in expanding stormwater retrofitting throughout the coastal corridor to address a tactic of the Inland Bays Pollution Control Strategy.

Subelement(s)
Outreach and Public Involvement; Research; Assessment and Monitoring; Water Quality; Healthy Communities; Tools; Training; Direct Assistance
CCMP/Work Plan Goal
<ul style="list-style-type: none"> ◆ G1A: Manage urban and rural applications and handling of fertilizers, pesticides, herbicides, pesticides, manure, sediment, animal carcasses and other contaminants ◆ G1C: Develop and implement a comprehensive stormwater management program ◆ G1E: Adopt the most effective Best Management Practices to provide maximum ground and surface water protection ◆ G2: Protect, restore, and enhance living resources by improving water quality and protecting and enhancing habitat ◆ G2F: Enhance and restore impacted shallow and nearshore habitats ◆ G5D: Address nitrates and other contaminants ◆ G8C: Educate the public and citizenry regarding the need for waste minimization and pollution prevention ◆ G9: Ensure, to the maximum extent possible, all planning and management activities related to the Inland Bays involve public participation, information and education

Primary Project Deliverables

Milestones
<ul style="list-style-type: none"> • implementation of South Bethany monitoring plan and the data it generates • education program with town (completed). • implementation of new water quality ordinances in South Bethany and nearby communities • final assessment project report and implementation strategy

Project Financing

Match	
Award: \$35,000 Army Corps of Engineers Grant	
Description	Expense
Contractual services	\$35,000

Project Critical Success Factors

Outcomes
<p>Short-term:</p> <ul style="list-style-type: none"> • increased awareness and understanding of pollution sources and controls for individual residences and businesses and communities • secure participation of other communities and businesses in the drainage to participate in assessment and implementation.

Intermediate:

- implementation of new ordinances and pollution controls in the drainage area and elsewhere in the Town of South Bethany.
- increased cooperation between stakeholders in the drainage area.

Long-term:

- decrease in loads of nitrogen, phosphorus, sediments, and hydrocarbons to the canal and Bay through pollution control measures such as stormwater retrofits.
- increase in understanding of stormwater retrofit process in the coastal corridor.

Changes (+/-) in Pressure Targets:

- increase in number of individuals educated
- increase of number of acres of stormwater retrofits per the Pollution Control Strategies goal

External Factors

Impacts

1. External factors discussion

CIB and the Town of South Bethany have contracted with the Center for Watershed Protection and JMT Engineering to conduct the stormwater assessment

2. CWA Implementation Information

Primary Role: Controlling non-point source pollution on a watershed basis

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CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Securing Wetland and Riparian Buffer Protection

Responsible Party/Partner Ed Lewandowski and Chris Bason
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Grant ID: CE99399009-0-2008

Status: On-going

Project Description

Project Overview

A draft of the Inland Bays Pollution Control strategy was presented during a public workshop without any meaningful inclusion of water quality buffers for new development. The Center undertook a comprehensive literature review of buffer effectiveness in the Atlantic Coastal Plain to develop a water quality buffer system specific to wetlands and water bodies of the Inland Bays Watershed that would assist in achieving the goals of the PCS. This document provides science-based recommendations for a water quality buffer system designed to protect and restore the quality of wetlands and water bodies of the Inland Bays watershed located in coastal Sussex County, Delaware. The document focuses on the long-term nutrient removal and retention function of buffers with respect to the total maximum daily load (TMDL) reductions of nitrogen and phosphorus needed for the Inland Bays and their tributaries. A Pollution Control Strategy (PCS) is being developed to meet these reductions in a timely fashion. The PCS is also a major tactic of the Inland Bays Comprehensive Conservation and Management Plan (CCMP) which has among its major goals 1) requiring the maximization of open space in developments, 2) establishing shoreline setbacks regulations that maintain tidal marshes, and 3) securing maximum protection for wetlands and waterways. Literature focused on Atlantic Coastal Plain buffers was reviewed to

recommend buffer alternatives by water body type and by buffer system characteristics. The alternatives were then applied to eleven randomly selected developments to determine acreage of buffer zones in buildable areas. Further recommendations based on these results are then provided. The results of this report were campaigned among decision makers and stakeholder groups, and assisted in improving somewhat the buffer provision of the promulgated PCS.

Subelement(s)

Water Quality; Habitat; Tools; Research

CCMP/Work Plan Goal

- ◆ G1E: Adopt the most effective Best Management Practices to provide maximum ground and surface water protection
- ◆ G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat
- ◆ G3: Develop and implement comprehensive zoning ordinances, laws, and regulations at all levels of government which promote environmentally sound land use
- ◆ G3B: Provide maximum protection of waterways, groundwater, natural areas, open space, and tidal and non-tidal wetlands
- ◆ G3D: Examine and improve existing regulations and enforcement
- ◆ G7B: Attain maximum wetlands preservation by providing adequate setbacks and buffer zones
- ◆ G7C: Develop regulations to protect non-tidal wetlands
- ◆ G7D: Strengthen enforcement of existing wetland protection regulations

Primary Project Deliverables

Milestones

- A final report titled, "Recommendations for an Inland Bays Watershed Buffer System," which details the STAC-approved characteristics of a water quality buffer system for the Inland Bays watershed

Project Financing

Match

Award: N/A

Description

Expense

Project Critical Success Factors

Outcomes
<p>Short-term:</p> <ul style="list-style-type: none">• a widespread understanding of the importance of water quality buffers and their effectiveness in improving and maintaining wetlands and water quality• increased understanding by decision-makers regarding the functions of wetlands and waterways and how different wetlands and waterways require different types of buffers to improve and maintain water quality <p>Intermediate:</p> <ul style="list-style-type: none">• moderate improvements in the buffer provision of the promulgated PCS• increased attempts by the County Planning and Zoning Commission to protect wetlands and waterways• data that detailed the actual acreage of buildable land that buffers would affect <p>Long-term:</p> <ul style="list-style-type: none">• will assist greatly in the future implementation of buffer ordinances in the watershed <p>Changes (+/-) in Pressure Targets:</p> <ul style="list-style-type: none">• N/A

External Factors

Impacts
<ol style="list-style-type: none">1. External factors discussion The publication of this report was a landmark action by the CIB in its efforts to implement the Inland Bays Pollution Control Strategies. The report has been peer-reviewed and can be used as a reference in other coastal plain watersheds.2. CWA Implementation Information Primary Role- Developing TMDLS; Controlling Non-point Source Pollution on a Watershed Basis; and, Wetlands

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Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report Executive Summary

Project Name: Urban and Community Forestry Program

Responsible Party/Partner: E.J. Chalabala
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restoration@inlandbays.org

Grant ID: CE99399009-0-2008

Status: On-going

Project Description

Project Overview

The trees in our cities and communities are a vital component of our forests as they provide a wide array of benefits including cleaner air and water, wildlife habitat, temperature moderation, and aesthetics. The Delaware Forest Service's Urban and Community Forestry Program provides technical assistance to cities, towns, developers, and homeowners to help manage and improve this important forest resource.

The Delaware Forest Service has partnered with the Delaware Center for the Inland Bays to increase the number of Inland Bay watershed communities involved in the Urban and Community Forestry Program. The Restoration Coordinator is responsible for informing the public about this program, and helps each interested community formulate a grant to secure funds for the planting of native trees in community open space.

Subelement(s)

Outreach and Public Involvement; Habitat; Living Resources; Direct Assistance

CCMP/Work Plan Goal

- ◆ G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat
- ◆ G3B: Provide maximum protection of waterways, groundwater, natural areas, open space, and tidal and non-tidal wetlands
- ◆ G9B: Identify user groups and their leadership
- ◆ G9C: Develop programs involving senior citizens and other special interest groups

Primary Project Deliverables

Milestones

- \$24,000 dollars spent on native trees for community open space project
- Customized presentations provided to 10 interested Homeowners' Associations

Project Financing

Match

Award: \$7,500 grant from Delaware Forest Service

Description	Expense
Salary, fringe and related materials/supplies	\$7,500

Project Critical Success Factors

Outcomes

Short-term:

- increased awareness for the Urban and Community Forestry Program throughout the watershed
- increased awareness and knowledge about the importance of planting native trees.

Intermediate:

- increased knowledge about grant writing techniques educated citizens who are better able to make important decisions regarding how they want to utilize their community open space
- sense of accomplishment in citizens who conserve and protect natural resources

Long-term:

- planting of native trees and creation of beneficial canopy habitat, travel corridors and an increase in nutrient uptake potential.

Changes (+/-) in Pressure Targets:

- increase in acres of native trees planted in the Inland Bays watershed
- decrease in nutrients contributed to the Inland Bays

External Factors

Impacts

1. External factors discussion

Delaware Forest Service approached the CIB regarding the difficulties it was experiencing trying to implement the Urban and Community Forestry Program in the Inland Bays watershed. CIB recognized the opportunity to utilize its staff and relationships in the watershed to enhance forestry program operations. Funding from the Delaware Forest Service helps to provide salary support for the Center's Restoration Coordinator.

2. CWA Implementation Information

None

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Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Conservation Easements

Responsible Party/Partner: Eric Buehl
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habitat@inlandbays.org

Grant ID: CE99399009-0-2008

Status: On-going

Project Description

Project Overview

In the past several years, the CIB has been approached by both agencies and individuals about its willingness and ability to accept and hold conservation easements resulting from conservation-minded landowners as well as those resulting from penalty and mitigation requirements. The benefits and challenges of accepting and holding conservation easements are many and varied. In Delaware, landowners are eligible for certain tax benefits, making it an economically-attractive way to protect land from future growth and development. CIB staff consulted with local realtors, lawyers, and other like-minded conservation groups and agencies to evaluate its capacity to hold and accept conservation easements and will make a recommendation to the Board of Directors on the steps necessary to implement this vital land-protection tool. An assessment of the Center's By-laws was conducted and it was determined that the CIB could, by resolution of the Board, accept real property donations and easements from private landowners.

Subelement(s)

Outreach and Public Involvement; Habitat; Living Resources; Direct Assistance

CCMP/Work Plan Goal

- ◆ G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat
- ◆ G3B: Provide maximum protection of waterways, groundwater, natural areas, open space and tidal and non-tidal wetlands

Primary Project Deliverables

Milestones

- Establish the legal structure and process for the CIB to accepted conservation easements and donations of real property

Project Financing

Match

Award: N/A

Description

Expense

Project Critical Success Factors

Outcomes

Short-term:

- raise organizational awareness about opportunities for the restoration and protection of critical lands in the Inland Bays watershed

Intermediate:

- increase organizational capacity to pursue and accept conservation easements and donated real estate

Long-term:

- establish the legal structure and process for the CIB to accepted conservation easements and donations of real property

Changes (+/-) in Pressure Targets:

- increase the acres of land in the watershed that are placed under conservation easements or other protective covenants

External Factors

Impacts

1. External factors discussion

CIB recently executed its first settlement on donated real estate (a 1.6 acre+/- parcel of waterfront property on Vines Creek)

2. CWA Implementation Information

None

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Eel Passage Restoration

Responsible Party/Partner: Eric Buehl
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habitat@inlandbays.org

Grant ID: CE99399009-0-2008

Status: Completed

Project Description

Project Overview

Indian River is considered by many to be a “hotspot” for American Eel (*Anguilla rostrata*) migration in the mid-Atlantic region. Since 2001, the Delaware Department of Natural Resources and Environmental Control has been monitoring eel migration each winter/spring at the head of tide on the Indian River, which is located at the base of the Millsboro Pond Dam. It is believed that American Eel spawn in the Sargasso Sea and after hatching, larval eels then drift/migrate towards the western Atlantic coast from South America to the Canadian Maritime provinces. Young unpigmented “glass eels” then begin an upstream migration in search of freshwater areas to mature. After maturing, the eels then migrate back to the Sargasso Sea to spawn and die. The peak migration season for young eels occurs from February through April.

In 2003, a grant to fund the construction of an eelway at Millsboro Pond Dam was submitted to the FishAmerica Foundation, whose funding was provided by NOAA. Approval was granted in 2004 and construction was completed in January 2005, with the first eel successfully passed on January 14. Monitoring continued each winter/spring from 2005 through 2007. In May of 2007, over 660 glass eels and elvers were passed through the eelway in a 24-hour period. At that point, it was decided to remove the monitoring net and

allow the eels to pass directly into the pond. The Millsboro Pond Dam Eelway was constructed from off-the-shelf materials at a cost of just over \$1,200. Approximately one-third of this cost was for educational signage.

Betts Pond Dam is where the second eelway has been installed in the Upper Indian River watershed and is located 1.2 miles upstream from Millsboro Pond. Monitoring below the dam indicated that almost all age classes, including glass eels, elvers, and young yellow eels, were present in the area. With cost-share assistance provided through the Wildlife Habitat Incentives Program (WHIP) of the USDA Natural Resources Conservation Service, the eelway design was completed in late spring of 2007. Permission from the Delaware Department of Transportation was granted at approximately the same time. In fall of 2007, the project was presented at the State's multi-agency Joint Permit Processing meeting. Landowner permission was granted in January 2008 and required Federal and State permits were granted in March of 2008. Construction was completed in two phases, with primary installation in May 2008 and final installation and operation in December 2008. The design of the eelway should allow the passage of these eels and allow access to habitat areas further upstream. Custom fabricated aluminum parts, supplies, and materials for the Betts Pond Dam Eelway totaled less than \$1,600.

Subelement(s)

Living Resources; Assessment & Monitoring

CCMP/Work Plan Goal

- ◆ G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat
- ◆ G9F: Promote education of out-of-state users and visitors

Primary Project Deliverables

Milestones

- an eelway that is successfully passing eels over the dam
- interpretive signage installed near the Millsboro Pond Dam eelway
- a high school student shadowed CIB staff and used eel migration and passage as the theme for a senior environmental science project.
- volunteer assistance for the installation and monitoring of both eelways
- staff appointment to the ASMFC American Eel Public Advisory Panel

Project Financing

Match

Award: \$1,500 cost-share from NRCS

Description	Expense
Materials/Supplies	\$1,500

Project Critical Success Factors

Outcomes
<p>Short-term:</p> <ul style="list-style-type: none">• positive press coverage and several public presentations on eel passage have increased general awareness about eels and fish passage
<p>Intermediate:</p> <ul style="list-style-type: none">• involvement on the ASMFC American Eel Public Advisory Panel is a direct result of these projects; also, CIB now regularly consults with DNREC on eel-related issues
<p>Long-term:</p> <ul style="list-style-type: none">• greater access to more habitat for the American eel, thereby further benefitting the species
<p>Changes (+/-) in Pressure Targets:</p> <ul style="list-style-type: none">• N/A

External Factors

Impacts
<p>1. External factors discussion None</p>
<p>2. CWA Implementation Information None</p>

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report Executive Summary

Project Name:	Community Habitat Enhancement
Responsible Party/Partner	Eric Buehl & E.J. Chalabala Center for the Inland Bays, Inc. 39375 Inlet Road Rehoboth Beach, DE 19971 (302) 226-8105 habitat@inlandbays.org & restoration@inlandbays.org
Grant ID:	CE99399009-0-2008
Status:	Completed

Project Description

Project Overview

In early 2006, the CIB conceived a “Backyard Habitat” program with a goal of providing both technical and financial assistance to subdivision homeowners’ associations (HOA) in the Inland Bays watershed in an effort to promote the use of native plants in community open space and individual back yards.

Information provided to HOAs focuses on the use of Delaware and Inland Bays-specific native plants, proper nutrient management, avoiding the use of non-native invasive species, and ways to reduce impacts from urbanization. Packets of printed information include fact sheets, booklets, pamphlets, and lists from a variety of sources. Upon request, PowerPoint presentations are made before HOA boards, committees, or their general membership. In many instances, the information is tailored specifically to the needs of that particular subdivision as it relates to amount of open space, drainage and/or stormwater management issues, and the desires of the HOA. In some cases, information and assistance are provided to businesses, civic organizations, and non-profit groups upon request.

The typical presentation generally evolves from contact from an HOA board member or interested resident looking for information or assistance. This in turn results in a site visit

that includes photo documentation, the delivery of basic handouts, and determining the “sense” of what the community is looking for as far as assistance. In almost all cases, the CIB has returned to make one or more presentations to the HOA and/or their membership. By this time, the presentation has been tailored to accommodate the needs of that particular subdivision, and in several cases, simulated images of their own open space has been modified to show native plant schemes in a before-and-after format.

The activities of the CIB’s program rely mainly on word-of-mouth and participation in Open Space and Stormwater Management Maintenance workshops held in the watershed. These workshops are open to HOA representatives who in turn relay information back to their membership. The CIB’s role is to encourage the use of native plants in back yards and community open space via a PowerPoint presentation and through print material. Workshop partners include the Sussex Conservation District and the Delaware Department of Natural Resources and Environmental Control.

Subelement(s)

Outreach and Public Involvement; Habitat; Water Quality; Living Resources; Training; Direct Assistance

CCMP/Work Plan Goal

- ◆ G1E: Adopt the most effective Best Management Practices to provide maximum ground and surface water protection
- ◆ G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat
- ◆ G3B: Provide maximum protection of waterways, groundwater, natural areas, open space and tidal and non-tidal wetlands
- ◆ G8C: Educate the public and industry regarding the need for waste minimization and pollution prevention
- ◆ G9F: Promote education of out-of-state users and visitors

Primary Project Deliverables

Milestones
<ul style="list-style-type: none"> • PowerPoint presentations specific to a given subdivision • Several localized plant lists based on information from area researchers. • Regional pamphlets and booklets provided at both the individual and homeowners’ association level • Site evaluations by CIB staff

Assistance Provided

<u>Subdivision</u>	<u>Technical</u>	<u>Financial</u>	<u>Presentation</u>
Hunters Run Plantings	X	X	X
Hunters Run Trees	X	X	X
Meadows at the Villages of Old Landing	X		X
Villages at Old Landing	X		X
Pond's Edge Subdivision	X	X	
Bethany-Fenwick Chamber of Commerce	X	X	
Nassau Station	X		
Sea Chase	X		
Shilo Farms II	X		
Bay Crossing	X		X

Project Financing

Match	
Award:	N/A
Description	Expense

Project Critical Success Factors

Outcomes
<p>Short-term:</p> <ul style="list-style-type: none"> • increased awareness and understanding about HOA responsibilities for property and stormwater system maintenance <p>Intermediate:</p> <ul style="list-style-type: none"> • positive changes in open space management (i.e. stormwater pond buffers, reduced mowing, etc.) • greater coordination between local and State stormwater programs • greater emphasis within the watershed on the use of native plants. <p>Long-term:</p> <ul style="list-style-type: none"> • increase in available habitat to support Inland Bays aquatic species <p>Changes (+/-) in Pressure Targets:</p> <ul style="list-style-type: none"> • increase in acreage of native plant habitat

External Factors

Impacts
<ol style="list-style-type: none"><li data-bbox="305 373 678 443">1. External factors discussion None<li data-bbox="305 478 773 548">2. CWA Implementation Information None

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Green Schools Initiative

Responsible Party/Partner: Sally Boswell
Center for the Inland Bays, Inc.
39375 Inlet Road
Rehoboth Beach, DE 19971
(302) 226-8105
outreact@inlandbays.org

Grant ID: CE99399009-0-2008

Status: **No Action Taken**

External Factors

Impacts

1. External factors discussion

CIB determined that a “Green Schools Program” was not closely aligned with its strategic mission and objectives and therefore, the program was abandoned in lieu of a more-enhanced Schoolyard Habitat Program

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Schoolyard Habitat Program

Responsible Party/Partner: Sally Boswell
Center for the Inland Bays, Inc.
39375 Inlet Road
Rehoboth Beach, DE 19971
(302) 226-8105
outreach@inlandbays.org

Grant ID: CE99399009-0-2008

Status: Completed

Project Description

Project Overview

Following on the heels of the successful creation of the first two schoolyard habitats at Long Neck E.S. and Phillip Showell E.S., the CIB expanded the program to include the programs at East Millsboro Elementary School and Indian River High School. This program targets schools in the watershed so that “watershed education” becomes part of the student experience throughout the entire school year. It also helps to further our education and outreach objectives, but supports other areas of our mission, including habitat restoration and science/research (data collection).

This project has the potential to bring watershed education to the students in the watershed every school day and to change the culture of our schools. The “demonstration habitat” model- taking watershed education to the citizens where they live, work and go to school- allows us to reach more citizens, more quickly in a high impact way.

Subelement(s)

Outreach and Public Involvement; Habitat; Water Quality; Living Resources; Direct Assistance

CCMP/Work Plan Goal

- ◆ G1E: Adopt the most effective Best Management Practices to provide maximum ground and surface water protection
- ◆ G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat
- ◆ G5B: Promote water conservation
- ◆ G5C: Protect groundwater recharge areas
- ◆ G8C: Educate the public and industry regarding the need for waste minimization and pollution prevention
- ◆ G9: Ensure, to the maximum extent possible, all planning and management activities related to the Inland Bays involved public participation information and education
- ◆ G9C: Develop programs involving senior citizens and other special interest groups
- ◆ G9E: Emphasize programs in the public schools

Primary Project Deliverables

Milestones

- Two additional schoolyard habitats in the Inland Bays watershed at E. Millsboro Elementary School and Indian River High School
- “Planning for Wetlands” (POW) workshops for lead teachers, students, facilities manager, volunteer leadership and administration at each school
- A Community Volunteer Leader for each school to work with us in planning and implementing the program. With their help, we conducted an extensive school outreach program to introduce “schoolyard habitat” to students, teachers, school administration and staff, parents and community volunteers to educate them about the watershed and to build enthusiasm and support for this project. This included assemblies in the schools, presentations at PTO meetings, presentations and plants in the classrooms, bulletin boards at the schools, and development of festivals around the planting days. We created powerpoints and flyers to use in this outreach. Special resources were produced and provided to all teachers at each school for “American Wetlands Month” in May to ready students for the project
- An outreach plan to invite the participation of citizens, organizations and businesses in the school communities to donate time, services and/or funding to the projects. Several garden clubs and civic organizations committed to assisting the schools and we successfully enlisted the help of the local press to build interest and community support for the projects
- “Planting Days” at the end of the school year. Community volunteers assisted and all the students and teachers at each school came outside to help plant and to learn about wetlands.
- A “WOW” (Wonders of Wetlands) workshop for teachers was given on an inservice day at each school to train teachers in how to use the schoolyard habitats to reinforce the work they are doing with students’ in the classroom. The activities they were introduced to were all correlated to the DE State Standards

Project Financing

Match	
Award: \$ 11,000 grant assistance from DNREC	
Description	Expense
Materials/Supplies	\$11,000

Project Critical Success Factors

Outcomes
Short-term: <ul style="list-style-type: none">• partnerships with the school district to bring a schoolyard habitat program to the district and create the opportunity to work together toward “greener” schools
Intermediate <ul style="list-style-type: none">• participation by students, teachers, administrators and custodians in the planning, design and execution of their schoolyard habitat; learning about watersheds and wetlands, about the importance of native habitats, and protecting fresh water• improvements in the treatment of stormwater quantity and quality on publicly-owned properties• removal of non native species and planting of native plant species, thereby improving biodiversity and creating awareness among students and staff of the importance of native biodiversity to the watershed
Long-term: <ul style="list-style-type: none">• engage schools and their administrators, teachers and students in a long-term, school-wide project to promote watershed education, habitat restoration and protection, water quality issues, environmental science, and stewardship of our Inland Bays watershed• development of a “green school” program to initiate best management practices for watershed-friendly schools• education of the future stewards of the Inland Bays watershed
Changes (+/-) in Pressure Targets: <ul style="list-style-type: none">• creation of two additional schoolyard habitats in the Inland Bays watershed

External Factors

Impacts
1. External factors discussion None
2. CWA Implementation Information Primary Role: Controlling Non-point Source Pollution on a Watershed Basis

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Town Hall Habitat Program

Responsible Party/Partner: Sally Boswell
Center for the Inland Bays, Inc.
39375 Inlet Road
Rehoboth Beach, DE 19971
(302) 226-8105
outreach@inlandbays.org

Grant ID: CE99399009-0-2008

Status: Completed

Project Description

Project Overview
This project introduced watershed education to public officials and citizens at the Town of Millville’s Town Hall- a public building regularly visited by citizens in the community. The “demonstration habitat” model- taking watershed education to the citizens where they live, work and go to school- allows CIB to reach more citizens more quickly in a high impact way. It’s a concept that CIB is already taking to the children, their parents, teachers, staff and administrators at schools in the watershed through our Schoolyard Habitat Program.
Subelement(s)
Outreach and Public Involvement; Habitat; Water Quality; Direct Assistance
CCMP/Work Plan Goal
<ul style="list-style-type: none"> • G1E: Adopt the most effective Best Management Practices to provide maximum ground and surface water protection • G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat

- G5B: Promote water conservation
- G8C: Educate the public and industry regarding the need for waste minimization and pollution prevention

Primary Project Deliverables

Milestones

- design and installation of a Native Plant Demonstration Garden along the perimeter of the parking lot including labeling of plants.
- design and installation of a rain garden along the main walk in front of the town hall. Installation of two rain barrels to collect water from the roof of the building to water the rain garden
- eradication of non native species in the tax ditch at the back perimeter of the property; planting of native species to create a “demonstration buffer” for the tax ditch. Installation of a flagstone path around the building. Creation and placement of education and outreach materials in the town hall to provide visitors with information on the features of the Town Hall Habitat; including information on how to build a rain garden, where to obtain rain barrels, information on native plants for our watershed.

Project Financing

Match

Award: \$14,000 grant assistance from DNREC

Description

Materials/Supplies

Expense

\$14,000

Project Critical Success Factors

Outcomes

Short-term:

- a partnership with the mayor, town council and managers of a town in a fast developing area of the watershed
- opened a dialogue for promoting best management practices for landscaping and residential storm water management
- increased awareness about native plants, their uses, and the value of buffers

Intermediate

- participation by the mayor, the town manager, and town hall staff in the planning, design and execution of the project
- town hall officials and staff, and volunteers from the community, actively involved in the planting of the native plant buffer along the parking lot and the rain garden

Long-term:

- improvements to storm water management on a publicly owned property
- an on-going education/outreach presence at a heavily used public facility to disseminate information to citizens, builders/developers, and public officials on the use of native plants, rain gardens as a best management practice, rain barrels, and the value of buffers on tax ditches and tributaries.

Changes (+/-) in Pressure Targets:

- creation of a town hall habitats for the Town of Millville

External Factors

Impacts

1. External factors discussion

The mayor of the Town of Millville is also a P/T Seasonal Instructor at the James Farm Ecological Preserve. Certainly, his enthusiasm and support for the Town Hall Demonstration Habitat Program was an extension of his connection with the CIB.

2. CWA Implementation Information

Primary Role: Controlling Non-point Source Pollution on a Watershed Basis

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Water Use Plan Implementation Committee (WUPIC)

Responsible Party/Partner E.J. Chalabala
Center for the Inland Bays, Inc.
39375 Inlet Road
Rehoboth Beach, DE 19971
(302) 226-8105
restoration@inlandbays.org

Grant ID: CE99399009-0-2008

Status: On-going

Project Description

Project Overview

The CIB completed and adopted a Water Use Plan for the Inland Bays in 2000. Since then, a dedicated group of volunteers has served to assist with implementation of the Water Use Plan. This group has had numerous achievements, including the establishment of an annual Inland Bays clean-up event, securing funding from the General Assembly to support additional marine enforcement officers, the placement of aids to navigation in major boat traffic areas, and promoting the activities of a rescue swimmer program to aid in Inland Bays incident response.

The Water Use Plan Implementation Committee continues to collaborate with staff from the University of Delaware Sea Grant program to refine its strategy to conduct a recreational boating survey for our waterways. In addition, the WUPIC has installed educational signage at numerous recreational access points around the Bays that encourage the user to “CPR-Conserve, Protect and Respect” the Inland Bays’ resources.

Subelement(s)

Outreach and Public Involvement; Habitat; Water Quality

CCMP/Work Plan Goal

- G6A: Identify existing use patterns and develop preferred use areas
- G6D: Determine use capacities based on public safety and environmental concerns
- G6E: Strengthen marine related activity enforcement
- G7: Establish and implement a shoreline protection program which addresses both natural processes and human activities

Primary Project Deliverables

Milestones

- Implementation of an annual Inland Bays Clean –up Event
- Installation of educational signage targeting recreational users

Project Financing

Match

Award: \$

Description

Grant assistance from DNREC

Expense

Materials/Supplies

Project Critical Success Factors

Outcomes

Short-term:

- evaluate and document the progress towards implementation of the Inland Bays Water Use Plan

Intermediate

- suggest plausible strategies to ensure achieving successful execution of the plan

Long-term:

- minimize environmental impacts, avoid user conflicts, and improve conditions related to water use activities in Delaware’s Inland Bays.

Changes (+/-) in Pressure Targets:

- Increase in educational signage targeting recreational users of the Bays

External Factors

Impacts
1. External factors discussion None
2. CWA Implementation Information None



Project Report

Executive Summary

Project Name:	Using cover cropping systems to reduce nutrient losses to the environment
Responsible Partner	Dr. Greg Binford and Dr. Richard Taylor University of Delaware College of Agriculture & Natural Resources Department of Plant and Soil Sciences 152 Townsend Hall Newark, DE 19716 (302) 831-2146 binfordg@udel.edu
Grant ID:	CE99399009-0-2008
Status:	Completed

Project Description

Project Overview

This study compared the benefits of cereal grain versus legume/cereal grain mixtures as cover crops.

It was conducted at two sites in Delaware (one in Kent and the other in Sussex County) on irrigated cornfields. The cover crop treatments were established immediately after harvest on fields that received animal manures in the spring prior to corn planting. The following cover crop treatments were compared:

- 1) No cover crop
- 2) Cereal grain only
- 3) Hairy Vetch/cereal grain/crimson clover mixture
- 4) Balansa clover/cereal grain mixture
- 5) Red clover/cereal grain mixture
- 6) Subterranean/cereal grain mixture

These treatments offered a range in growth habit of cover crops and a range in seed prices. It was important to evaluate no cover crop and a cereal grain cover in this demonstration/research project so the environmental benefit of each of these cover crop mixtures could be determined. Each cover crop treatment was replicated three times at each location.

In the spring of 2007, the cover crop treatments were killed and planted to corn. Each cover crop treatment was subdivided into six smaller plots so that six different fertilizer N rates were evaluated. Each plot was monitored during the 2007 season by taking periodic soil samples and leaf chlorophyll meter readings; these measurements allowed an estimate of how nitrogen was being released from the legume residues. In the fall of 2007, corn grain yields were measured on each plot and soil samples were taken to measure residual nitrate levels in the soil profile.

Subelement(s)

Research; Assessment and Monitoring; Water Quality; Tools

CCMP/Work Plan Goal

- ◆ G1A: Manage urban and rural applications and handling of fertilizers, pesticides, herbicides, manure, sediment, animal carcasses, and other contaminants
- ◆ G1E: Adopt the most effective BMPs to provide maximum ground and surface water protection

Primary Project Deliverables

Milestone 1

- Sussex County and Kent County project sites planted with legumes (fall 2006)
- Sussex and Kent County project sites planted with corn (spring 2007)
- Kent County project site replanted with legumes (fall 2007)
- Kent County site replanted with corn (spring 2008)
- Soil sampling and analysis (fall 2008)
- Final report (spring 2009)

Project Financing

Budget

Award: \$19,623

Description	Expense
Hourly labor	\$3,500
Fringe benefits @ 8%	\$280

Supplies and laboratory analyses	\$8,272
Travel	\$3,160
Indirect costs	\$4,411

Project Critical Success Factors

Outcomes
<p>Short-term:</p> <ul style="list-style-type: none"> demonstrate the efficacy of a legume cover crop for cereal grain production agriculture <p>Intermediate</p> <ul style="list-style-type: none"> alteration of cover crop applications by agricultural operators <p>Long-term:</p> <ul style="list-style-type: none"> improve Inland Bays water quality by attaining TMDLs <p>Changes (+/-) in Pressure Targets:</p> <ul style="list-style-type: none"> reduced N concentrations in groundwater and surface water

External Factors

Impacts
<p>1. External factors discussion</p> <p>Research elsewhere has shown that a legume/cereal grain mixture can make an excellent cover crop. Nitrogen that is fixed by legumes is slowly released through mineralization. As a result, there is smaller amount of available or leachable nitrogen in the soil at a given time compared to fertilizer N. Therefore, the potential for N loss from the legume residues during late spring and summer is greatly reduced compared to fertilizer N. The cereal grain is also good at scavenging residual nutrients in the soil following harvest. Legumes have also been shown to be excellent crops for building soil health. Both have direct implications for water quality improvement in Delaware's Inland Bays.</p> <p>Legume crops planted in fall 2006 did not establish on the Kent County field. The researcher requested a no-cost extension to replant legumes on the Kent County field in fall 2007, to be followed by a planting of corn in spring 2008. The corn was not harvested until fall 2008, at which time soil samples were obtained for analysis.</p> <p>2. CWA Implementation Information</p> <p>Controlling non-point source pollution on a watershed basis</p>

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Assessment and Monitoring of Harmful Algal Cysts in High Nutrient-Rich Areas of the Delaware Inland Bays

Responsible Partner Dr. Craig Cary
Graduate College of Marine & Earth Studies
University of Delaware
700 Pilottown Road, Lewes, DE 19958
(302) 645-4078
carys@udel.edu

Grant ID: CE99399009-0-2008

Status: Completed

Project Description

Project Overview

This study examined the distribution of harmful phytoplankton cysts over winter periods within areas of the Inland Bays that are known to experience high nutrient input from point sources, as well as other non-point sources. Sediment cores were taken from multiple sites and assayed for harmful algal cysts. It was hypothesized that a larger distribution of these cysts would be found in fine-grained sediment areas that would be downstream of large nutrient influx sources, and these cysts are primary contributors in the spring to seeding the Inland Bays. This study provided a baseline for the continued assessment of water quality improvement efforts in these nutrient impacted areas, as well as provide a map of resident harmful algal cyst distributions within the Inland Bays. State monitoring agencies can use the map to assess risk potential and ecosystem recovery.

Subelement(s)

Research; Assessment and Monitoring; Reporting; Water Quality

CCMP/Work Plan Goal

- ◆ G2E: Enhance monitoring and response strategies
- ◆ G5D: Address nitrates and other contaminants

Primary Project Deliverables

Milestone 1

- Sample collection (completed)
- Water and sediment chemistry analysis (completed)
- Sample extraction (completed)
- RT-Quantitative PCR
- Analysis, mapping and report

Project Financing

Budget

Award: \$18,490

Description	Expense
Graduate student support	\$10,715
Small boat operations	\$500
Supplies and expendables	\$2,000
Indirect Costs	\$5,275

Project Critical Success Factors

Outcomes

Short-term:

- attain a more complete understanding of the concentration and location of harmful phytoplankton in the Inland Bays

Intermediate

- improving monitoring and response strategies

Long-term:

- N/A

Changes (+/-) in Pressure Targets:

- N/A

External Factors

Impacts

1. External factors discussion

Results of this study were presented at a meeting of the Inland Bays Scientific & Technical Advisory Committee. Managers and staff from the Delaware Department of Natural Resources & Environmental Control/Laboratory Services Section attended the meeting and discussed how the findings from this study might be integrated in their water quality monitoring strategies.

2. CWA Implementation Information

Improving water quality monitoring

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Ingress of larval fishes through Indian River Inlet: Patterns of abundance and development of a Juvenile Fish Index to assess water quality in the Inland Bays system

Responsible Partner Dr. Timothy E. Targett
University of Delaware
Graduate College of Marine & Earth Studies
700 Pilottown Road
Lewes, DE
(302) 645-4396
ttargett@udel.edu

Grant ID: CE99399009-0-2008

Status: Completed

Project Description

Project Overview

Indian River Inlet is the primary location for tidal exchange of water between Indian River and Rehoboth Bays, Delaware, and the coastal ocean (Wong 2002). All fish larvae from species spawning in the coastal ocean (and beyond) therefore enter the Inland Bays through this inlet. Abundance and inter-annual variability of these fishes in the bays is determined in part by larval supply. Sampling larval fishes (ichthyoplankton) at the inlet presented a unique opportunity to 1) examine seasonal dynamics in the supply of young fishes such as Atlantic menhaden (*Brevoortia tyrannus*), summer flounder (*Paralichthys dentatus*), Atlantic croaker (*Micropogonias undulatus*), spot (*Leiostomus xanthurus*), and American eel (*Anguilla rostrata*) to the Inland Bays system and 2) link species-specific estimates of larval abundance (larval supply) with existing DNREC juvenile fish (young-of-the-year (YOY)) survey results to begin to determine whether variability in abundance of the above species in the Inland Bays is determined largely by larval influx or by process affecting subsequent survival within the bays.

The project developed a Juvenile Fish Index (JFI) for each species, which can be used as a

measure of the overall health of the Inland Bays system for young fishes, and how the system changes over time. JFIs were based on juvenile abundance estimates (available from DNREC trawl surveys) scaled to the strength of larval influx (from the proposed ichthyoplankton sampling at Indian River Inlet). DNREC's juvenile fish abundance data (#/minute trawl time) are collected by John Clark with a 3m trawl (5min tows) at 15 sites in Herring, Love, Pepper, and White Creeks, and upper Indian River. Surveys are conducted every two weeks in June, July, and August, and monthly in May, September and October).

The proposed research also offered a unique opportunity to examine dynamics in abundance of larval Atlantic menhaden, summer flounder, Atlantic croaker, spot, and American eel entering the Inland Bays through the inlet and to couple this with assessments of subsequent juvenile (YOY) abundance (already undertaken by DNREC trawl surveys) to provide indices for assessment of the overall health of the Inland Bays system for young fishes. If JFI values for a given species show the same temporal trends as juvenile abundance from the DNREC trawl surveys, this would indicate year-to-year variability driven largely by differences in larval supply. However, if JFI values show different temporal patterns than juvenile abundance, this would indicate year-to-year variability in survival within the bays overrides larval supply in determining juvenile abundance. For example, increasing JFI values when juvenile abundance is stable would signal decreased survival in the bays for that particular species.

Another advantage of this approach is that annual measures of JFI for each of the target species are indices that can be used in conjunction with water quality indices (e.g. dissolved oxygen, secchi disk depth, dissolved organic nitrogen and phosphorous, chlorophyll a, and suspended solids) generated from 25 sites by the Inland Bays Citizen Monitoring Program to assess water quality in the Inland Bays. The proposed work helped link water quality directly to fish abundance patterns. Furthermore, and perhaps more importantly, the target species may show different JFI patterns over time, which can be related to different water quality indices. This will allow assessment of potential impacts of changes in water quality components, or combinations of components, on fishes in the Inland Bays.

Subelement(s)

Research; Assessment and Monitoring; Habitat; Water Quality; Living Resources; Tools

CCMP/Work Plan Goal

- ◆ G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat
- ◆ G2B: Restore finfish and shellfish populations
- ◆ G2E: Enhance monitoring and response strategies

Primary Project Deliverables

Milestone 1

- Completed larval fish sampling at Indian River Inlet

- Calculated Juvenile Fish Indices by September 2007
- Presented research data at meeting of the Inland Bays Scientific & Technical Advisory Committee during Winter '08
- Completed and release final research report during Summer 08

Project Financing

Budget	
Award:	\$19,995
Description	Expense
Graduate student support	\$8,370
Fringe benefits	\$251
Expendable supplies & equipment	\$2,245
Boat rental fees	\$5,000
Indirect costs	\$4,129

Project Critical Success Factors

Outcomes
<p>Short-term:</p> <ul style="list-style-type: none"> • more comprehensive understanding of the patterns of the dynamics and patterns of larval fish transport into the Inland Bays <p>Intermediate</p> <ul style="list-style-type: none"> • a Juvenile Fish Index to be used as an Inland Bays environmental indicator <p>Long-term:</p> <ul style="list-style-type: none"> • better strategies for the restoration of finfish populations in the Inland Bays <p>Changes (+/-) in Pressure Targets:</p> <ul style="list-style-type: none"> • N/A

External Factors

Impacts
<p>1. External factors discussion Results of this study were presented at a meeting of the Inland Bays STAC</p> <p>2. CWA Implementation Information None</p>

Proposed and Continuing Projects for Fiscal Year 2010

Due to the uncertainties regarding continuing contractual funding support from the State of Delaware for FY2010, the CIB decided to suspend its grants program to solicit new research, demonstration, restoration and education/outreach projects and activities. Instead, staff engaged in a process that attempted to closely align proposed projects and activities with the strategic action plan and priorities identified during the 2008 organizational retreat.

DELAWARE



CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Inland Bays CCMP Project Management & Oversight

Responsible Partner Center for the Inland Bays
39375 Inlet Road
Rehoboth Beach, DE 19971
(302) 226-8105
Edward A. Lewandowski, Executive Director
director@inlandbays.org

Grant ID:

Status: On-going

Project Description

Project Overview

The Center for the Inland Bays, Inc. is an innovative management approach to watershed restoration and protection. Critical to the success of CCMP implementation activities is effective research and demonstration project oversight, grant development and management, contract administration, and coordination with organizations responsible for various work elements as well as tracking and communication of progress. The Board of Directors, the office of the Executive Director and other appropriate staff, will be responsible for these tasks.

The Center for the Inland Bays, Inc. is a unique organization established under the National Estuary Program. The nonprofit Center for the Inland Bays, Inc., enabled under special legislation signed into law in July 1994, sets up governance to oversee implementation of the Inland Bays Comprehensive Conservation and Management Plan.

The CIB is administered by a nine member Board of Directors consisting of the following members: Secretary of the Department of Agriculture, Secretary of Dept of Natural Resources & Environmental Control, a representative from the Sussex Conservation District, the Sussex County Council, a representative from the Sussex County Association of Towns,

the Chair of the Scientific and Technical Advisory Committee, the Chair of the Citizens Advisory Committee, a designee of the President Pro-Tem of the Delaware State Senate, and a designee of the Speaker of Delaware State House of Representatives. The EPA is an Ex-Officio member.

Subelement(s)

Financial Management; Tracking/Reporting; Program Planning and Administration; Outreach and Public Involvement; Research; Assessment and Monitoring; Reporting; Habitat; Water Quality; Living Resources; Healthy Communities; Tools; Training; Direct Assistance

CCMP/Work Plan Goal

All inclusive

Primary Project Deliverables

Milestones

- Secure state funding and other match sources to support the Section 320 grant and implementation of CIB Work Plan
- Prepare and distribute program updates and associated progress reports to the Board of Directors and EPA (quarterly)
- Hire and/or retain appropriate support staff as needed
- Monitor budgetary and financial reconciling procedures
- Provide administrative (meeting arrangements, notifications, minutes, etc) support for the Board of Directors, Scientific and Technical Advisory Committee, Citizen’s Advisory Committee and other CIB committees
- Provide communication documents, including the Inland Bays Journal (three times per annum- spring/summer/fall), to public and private groups/individuals, state, county, and local governments.
- Publish a CIB annual report and distribute to select audiences, including the Delaware General Assembly, as required by HB540- the Inland Bays Watershed Enhancement Act.
- Facilitate implementation and monitor/track the progress of lead agencies responsible for implementation of CCMP tactics
- Provide educational programs to schools, homeowners, and other publics to show better management practices within the Inland Bays watershed; methods will include programs, lectures, slide shows, seminars, as well as media interaction

(radio, TV, news articles, etc).

- Continue to support the promulgation of Inland Bays Pollution Control Strategy regulations in cooperation with the Delaware Department of Natural Resources & Environmental Control
- Continue restoration initiatives at the James Farm Ecological Preserve as well as on other public and private properties with a goal of 250 acres restored and/or protected
- Serve on state-wide and regional committees and task-forces to promote sound environmental policies based on best available science
- Continue oversight and management of the Inland Bays Shellfish Restoration Program and Oyster Gardening Program in cooperation with the College of Marine Studies (U.D.) and Delaware State University.
- Travel to national and regional EPA meetings and estuary-related conferences; provide technical assistance to other programs.
- Serve in an advisory capacity to elected officials, public policy makers and civic leaders
- Organize and host special events, such as the Native Plant Sale, the Inland Bays Clean-up, the Diamondback Dash 5K race, and other public outreach activities.
- Augment the CIB's membership program and sustain opportunities for volunteer participation
- Continue to collaborate with the Inland Bays Citizens' Advisory Committee to expand the activities of its Outreach and Public Policy subcommittees.
- Diversify sources of non-federal income to support the CIB's programs and activities
- Continue to demonstrate the use of renewable energy and renewable/recyclable resources at the Center's "green" headquarters facility

Project Financing

Budget	
Total:	\$600,000
Description	Expense
See approved budget	

Project Critical Success Factors

Outcomes
Short-term: N/A
Intermediate: N/A
Long-term: N/A
Changes (+/-) in Pressure Targets: N/A

External Factors

Impacts
1. External factors discussion None
2. CWA Implementation Information None

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Sensitive Shallow Water Area Markings

Responsible Partner E.J. Chalabala
Center for the Inland Bays
39375 Inlet Road
Rehoboth Beach, DE 19971
(302) 226-8105
restoration@inlandbays.org

Grant ID:

Status: New

Project Description

Project Overview

Boating on the bays may cause a number of environmental impacts, including increasing the amount of turbidity in the bays. Major turbidity problems begin around Memorial Day and start to subside after Labor Day. Turbidity can impact the bays negatively in that it prevents light from reaching the bay bottom, which is essential for the growth of submerged vascular plants (e.g. Eelgrass). Bottom scouring (or prop scouring) of sediment can also occur if boats or personal watercraft get too close to shore, or run aground in shallow areas in the bays. These impacts, though not often visible, can impact bottom-dwelling plant and animal communities.

Existing boating regulations in the Inland Bays include restricting boat speed in designated areas (no-wake zones), which include some shoreline shallow areas. However, many shallow water sensitive areas remain unmarked and susceptible to impacts of watercraft. In addition, educational materials (Inland Bays Boaters' Guide) are available, which inform the public about shallow water impacts, but they may not be reaching all pertinent boaters.

The Inland Bays Water Use Plan Implementation Committee (WUPIC) has identified marking sensitive shallow water areas as a priority action. The WUPIC will collaborate with the

Department of Natural Resources & Environmental Control and the USCG to inventory and map sensitive shallow water areas (e.g. resource protection areas or habitat restoration sites) in the bays. Subsequently, appropriate signage will be created and installed near these sensitive shallow water areas to restrict speed of craft in sensitive areas, not just for safety or property concerns, but to protect living resources as well.

Subelement(s)

Outreach & Public Involvement; Habitat; Water Quality; Living Resources;

CCMP/ Work Plan Goal

- ◆ G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat
- ◆ G2A: Promote recurrence of submerged aquatic vegetation
- ◆ G2F: Enhance and restore impacted shallow and nearshore habitats
- ◆ G3B: Provide maximum protection f waterways, groundwater, natural areas, open space, and tidal and non-tidal wetlands
- ◆ G6D: Determine use capacities based on public safety and environmental concerns
- ◆ G9F: Promote education of out-of-state users and visitors

Primary Project Deliverables

Milestones

- inventory and map sensitive shallow water areas (e.g. resource protection areas or habitat restoration sites) in the bay
- develop and install appropriate signage near sensitive shallow water areas to restrict speed of craft in sensitive areas, not just for safety or property concerns, but to protect living resources as well.

Project Financing

Budget

Total: \$5,000

Description	Expense
Mapping activity	\$1,500
Signage	\$3,500

Project Critical Success Factors

Outcomes
<p>Short-term:</p> <ul style="list-style-type: none">• evaluate and document the progress towards implementation of the Inland Bays Water Use Plan
<p>Intermediate:</p> <ul style="list-style-type: none">• suggest plausible strategies to ensure achieving successful execution of the plan
<p>Long-term:</p> <ul style="list-style-type: none">• minimize environmental impacts, avoid user conflicts, and improve conditions related to water use activities in Delaware’s Inland Bays.
<p>Changes (+/-) in Pressure Targets:</p> <ul style="list-style-type: none">• increase in educational signage targeting recreational users of the Bays

External Factors

Impacts
<p>1. External factors discussion None</p>
<p>2. CWA Implementation Information None</p>



Project Report

Executive Summary

Project Name: James Farm Kiosk & Educational Signage

Responsible Partner Sally Boswell
 Center for the Inland Bays
 39375 Inlet Road
 Rehoboth Beach, DE 19971
 (302) 226-8105
outreach@inlandbays.org

Grant ID:

Status: New

Project Description

Project Overview
<p>The James Farm Ecological Preserve is owned by Sussex County and managed by the Center for the Inland Bays. It is open to the public every day of the year from sun up to sun down. In addition to thousands of visits by residents and visitors each year, James Farm is host to about 1,000 7th and 8th grade middle school students who come to the Farm for a full day of instruction each school year. A kiosk was built next to the parking lot as a point for providing information to visitors, but permanent signage, waterproof ‘cabinets’ for posting information, and waterproof brochure racks need to be designed, built and installed to make the kiosk functional for its intended use.</p>
Subelement(s)
<p>Outreach & Public Involvement</p>
CCMP/ Work Plan Goal
<ul style="list-style-type: none"> ◆ G9: Ensure, to the maximum extent possible, all planning and management activities related to the Inland Bays involved public participation, information and education

- ◆ G9C: Develop programs involving senior citizens and other special interest groups
- ◆ G9F: Promote education of out-of-state users and visitors

Primary Project Deliverables

Milestones

- Assess and evaluate current information provided on signage at the James Farm
- Contract with sign fabricator for design and fabrication of new signage for the James Farm Ecological Preserve
- Install new signage and complete needed improvements on existing kiosk

Project Financing

Budget

Total: \$5,000

Description	Expense
Design, construction, installation	\$5,000

Project Critical Success Factors

Outcomes

Short-term:

- provide citizens and students with timely, seasonal information about conditions and opportunities at the James Farm Ecological Preserve

Intermediate:

- change the behavior of visitors through education and awareness regarding their impact on the Ecological Preserve and the watershed.

Long-term:

- provide a 'satellite location' for watershed education and citizen awareness

Changes (+/-) in Pressure Targets:

- watershed education for residents and out of state visitors

External Factors

Impacts

1. **External factors discussion**
None
2. **CWA Implementation Information:**
None

Project Report

Executive Summary

Project Name: Aquaculture Charette

Responsible Partner Chris Bason & Ed Lewandowski
Center for the Inland Bays
39375 Inlet Road
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(302) 226-8105
chrisbason@inlandbays.org
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and

John Ewart
University of Delaware
700 Pilottown Road
Lewes, DE
645-4060
ewart@udel.edu

Grant ID:

Status: New

Project Description

Project Overview

Over the past several years, the CIB, in collaboration with the University of Delaware's Marine Advisory Program and Delaware State University, has successfully demonstrated the viability of growing shellfish in the Inland Bays using a variety of aquaculture techniques and methods. These include the off-bottom culture of oysters using Taylor floats and other commercial aquaculture gear.

In response to recent inquiries regarding the potential for commercial shellfish aquaculture operations in Delaware's Inland Bays, the CIB proposes to organize and host a one-day charrette to explore the feasibility of shellfish aquaculture operations in Delaware's Inland Bays. Invited guests will include technical experts, resource managers, and policy and decision-makers. Proceedings from the charrette will be published and distributed to local policy and decision-makers as key findings concerning this emerging issue.

Subelement(s)
Program Planning and Administration; Water Quality; Living Resources; Direct Assistance
CCMP/ Work Plan Goal
<ul style="list-style-type: none"> ◆ G6A: Identify existing use patterns and develop preferred use areas ◆ G6D: Determine use capacities based on public safety and environmental concerns ◆ G9: Ensure, to the maximum extent possible, all planning and management activities related to the Inland Bays involve public participation, information and education

Primary Project Deliverables

Milestones
<ul style="list-style-type: none"> • Plan, develop, and schedule a one-day charrette on commercial aquaculture in the Inland Bays • Host one-day charrette at a preferred location in the Inland Bays watershed • Compile data, record comments/notes and publish the proceedings from the charette • Distribute published proceedings to key policy and decision-makers

Project Financing

Budget	
Total:	\$3,000
Description	Expense
Meeting facilities, materials/supplies	\$3,000

Project Critical Success Factors

Outcomes
<p>Short-term:</p> <ul style="list-style-type: none"> • Increase awareness about the potential for and feasibility of establishing commercial shellfish aquaculture ventures in Delaware’s Inland Bays <p>Intermediate</p> <ul style="list-style-type: none"> • N/A <p>Long-term:</p> <ul style="list-style-type: none"> • N/A <p>Changes (+/-) in Pressure Targets: N/A</p>

External Factors

Impacts
1. External factors discussion None
2. CWA Implementation Information None

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Rain Gardens for the Bays

Responsible Partner Sally Boswell
Center for the Inland Bays
39375 Inlet Road
Rehoboth Beach, DE 19971
(302) 226-8105
outreach@inlandbays.org

Grant ID:

Status: New

Project Description

Project Overview

The CIB, in collaboration with EPA Region III, will engage in an ambitious three year initiative to create 1,000 rain gardens in the Inland Bays watershed. Preliminary activities have already started in the spring of 2009 with the launch of the Center for Inland Bays local campaign. This will be followed by intensive efforts to promote and install rain gardens in 2010 and 2011.

Through the Rain Gardens for the Bays, the Center for Inland Bays will leverage resources, technical assistance, and shared information to achieve the following:

- Coordination with other partnerships and stakeholders with activities such as programs such as the Delaware Nature Society's Backyard Habitat program, Project NEMO, etc.
- Increased community and neighborhood involvement in improving water quality
- Promotion of low-impact development
- Dissemination of information about rain gardens and green solutions
- Promotion of native plants and local biodiversity
- Training for partners and participants

- Education of students, Scouts, clubs, and related groups
- Rain garden registration and monitoring
- Marketing through the media
- Outreach at farmers' markets, fairs, and festivals
- Friendly cross-jurisdictional competitions,
- Special outreach efforts to reach youth, at-risk youth, the elderly, the disabled and foreign-language communities
- Adoption of policies and/or ordinances that promote green best management practices to prevent pollution and mitigate stormwater run-off to our Estuaries

Subelement(s)

Outreach and Public Involvement; Water Quality; Healthy Communities; Training; Direct Assistance

CCMP/ Work Plan Goal

- ◆ G1C: Develop and implement a comprehensive stormwater management program
- ◆ G1E: Adopt the most effective Best Management Practices to provide maximum ground and surface water protection
- ◆ G2: Protect, restore and enhance living resources by improving water quality and protecting and enhancing habitat
- ◆ G3: Develop and implement comprehensive zoning ordinances, laws, and regulations at all levels of government, which promote environmentally sound land use

Primary Project Deliverables

Milestones

Coordination and Collaboration:

- Continue to convene Partners Forum to assist in Campaign design and implementation
- Identify sponsors and fundraising opportunities

Education and Outreach:

- Update/distribute outreach/marketing materials, as needed
- Maintain Campaign website
- Update media packets
- Conduct training workshop (by request)

Implementation:

- Seek needed authorities and permission to install demonstration rain gardens
- Design and install rain gardens in public places (to increase visibility)
- Work with willing local governments to integrate 'green design' into policies and programs
- Initiate a Rain Garden Competition (Estuary – wide)

- Initiate a Corporate Lands RG focus in coordination w/partners working w/corporations (DNS, etc.)

Project Financing

Budget	
Total:	\$10,000
Description	Expense
Contractual	\$5,000
Materials/Supplies	\$5,000

Project Critical Success Factors

Outcomes
<p>Short-term:</p> <ul style="list-style-type: none"> • educate property owners, businesses, developers, and students about water quality, native plants, and green solutions • engage citizens in practical “backyard” solutions for water quality improvement <p>Intermediate:</p> <ul style="list-style-type: none"> • increased community and neighborhood involvement in improving water quality • adoption of policies and/or ordinances that promote green best management practices to prevent pollution and mitigate stormwater run-off <p>Long-term:</p> <ul style="list-style-type: none"> • Increase in the number of rain gardens implemented in the Inland Bays watershed <p>Changes (+/-) in Pressure Targets:</p> <ul style="list-style-type: none"> • decrease in nutrient contributions to the Inland Bays

External Factors

Impacts
<p>1. External factors discussion None</p> <p>2. CWA Implementation Information Primary role: Controlling non-point source pollution on a watershed basis</p>

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Environmental Indicators/State of the Bays Report

Responsible Partner Chris Bason
Center for the Inland Bays
39375 Inlet Road
Rehoboth Beach, DE 19971
(302) 226-8105
chrisbason@inlandbays.org

Grant ID:

Status: New

Project Description

Project Overview

The CIB STAC first published an environmental indicators report in 2004. The report received the input of a number of dedicated individuals from multiple groups and is an excellent first iteration of tracking and communicating the overall condition of the Bays. The STAC now aims to update and assess the current environmental indicators, explore the need for and identify new indicators, and develop a strategy to effectively collect and report this information over time to the public and policy makers. The purpose of this process is to develop the Inland Bays Environmental Indicators into the most complete and coherent explanation of the current ecological condition of the Bays and their watershed, and to relate this to the progress towards their restoration in a manner that regularly informs and involves the public.

Subelement(s)

Tracking/Reporting; Assessment & Monitoring; Research; Reporting

CCMP/ Work Plan Goal

- ◆ G2E: Enhance monitoring and response strategies
- ◆ G9: Ensure, to the maximum extent possible, all planning and management activities related to the Inland Bays involve public participation, information and education

Primary Project Deliverables

Milestones

- Review and update existing environmental indicators (completed).
- Select and conceptually develop new environmental indicators (ongoing).
- Develop and implement an environmental indicators reporting strategy.

Project Financing

Budget

Total: \$12,000

Description	Expense
Printing and reproduction	\$12,000

Project Critical Success Factors

Outcomes

Short-term:

- increased stakeholder understanding about trends in watershed health over time
- increased resource manager understanding of the interrelations between watershed stressors and condition.

Intermediate

- expected significantly more informed expectant attitudes in general public and policy makers for increased and maintained pollution control.

Long-term:

- overall improved environmental condition (chemical and biological) in response to increased action from provision of easily understandable condition assessment.

Changes (+/-) in Pressure Targets:

- increase in the number of Inland Bays environmental indicators

External Factors

Impacts
1. External factors discussion None
2. CWA Implementation Information None

DELAWARE



CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name:	Volunteer Intensive and Representative Condition Assessment of the Bays (VIRCAB) &
Responsible	Joseph G. Farrell, UD SGMAS Marine Resource Management Specialist, and Program Manager, UD Citizen Monitoring Program University of Delaware, College of Marine and Earth Studies 204H Cannon Laboratory, 700 Pilottown Road, Lewes, DE 19958 302-645-4250 (phone) jfarrell@udel.edu (e-mail) Edward Whereat, Ph.D., Program Coordinator, UD Citizen Monitoring Program University of Delaware, College of Marine and Earth Studies 105 Pollution Ecology Lab, 700 Pilottown Road, Lewes, DE 19958 302-645-4252 (phone); whereat@udel.edu (e-mail) Robin Tyler, Ph.D. Department of Natural Resources & Environmental Control Laboratory Services Section 89 Kings Highway Dover, DE 19903 (302) 739-9941 robin.tyler@state.de.us
Grant ID:	CE99399009-1-2009
Status:	On-going (FY2009 Work Plan)

Project Description

Project Overview

The UD Citizen Monitoring Program has been collecting water quality data in the Inland Bays since 1991, primarily from shoreline bulkheads, docks or piers in tributaries and the main bays.

Our data provides valuable trend information over 17 years. In general, our coverage is more comprehensive in the tributaries than the main bays where we have recruited volunteers from

the many tributary based waterfront communities. On the other hand, the existing suite of environmental water quality indicators have been based on the habitat requirements of Eelgrass (*Zostera marina*), the keystone species of submerged aquatic vegetation (SAV) for the Inland Bays, and as such, they are only applicable to the main bays (Secchi depth, Chlorophyll a, Total Suspended Solids, Dissolved Inorganic Nitrogen and Phosphorus).

Over the years, our volunteers have expressed interest in boat sampling. To be effective, this effort would require additional oversight and modified sampling design. It would, however, provide a new dimension to our Citizen Monitoring Program effort and offer the potential benefit of an additional data source for an SAV indicator.

This pilot project will extend our monitoring capabilities to sample open water bay sites by boat, and will provide sequential monthly assessments from May through September that will be reported to the public on our web page. The project will offer comparisons to previous research on the habitat requirement of Eelgrass in the Inland Bays done by researchers at the UD CMES and DNREC.

In addition, other pertinent indicators will also be included in the study, such as Dissolved Oxygen, the abundance of Macroalgae and Harmful Phytoplankton blooms, and the levels of fecal bacteria that are used as an indicator of the safety of recreational contact (Total Enterococcus).

In the past, the Center for Inland Bays has supported our previous pilot efforts, including the Phytoplankton Monitoring Program, which has become a highly successful core program.

Primary Objectives/Opportunity

- To form a small group of volunteers (6 boats, with teams of 2-3 volunteers per boat) committed to using their personal vessels to collect water quality samples from the main bays on a monthly basis during summer 2009.
- To focus on measuring parameters that are core diagnostic environmental indicators for Eelgrass habitat requirements (*), or other indicators routinely used by EPA or DNREC (**i.e. things for which standards exist).

Parameters measured by volunteers on boat:

- Secchi Depth* and Water Depth
- Water Temperature and Salinity
- Dissolved Oxygen**

<ul style="list-style-type: none"> - Macroalgae abundance (by grapple hook) - Parameters measured by laboratory analysis: - Chlorophyll a* and Total Suspended Solids* - Dissolved Inorganic Nitrogen* and Phosphorous* - HAB identification and enumeration - Total Enterococcus** <ul style="list-style-type: none"> • To compare data from the main bays to data collected from existing shoreline sites which largely are in the tributaries. • To compare results to previous environmental indicator studies, and to form a low cost option of continuing sampling of the bays by volunteers with boats in future years.
CCMP/ Work Plan Goal
◆ G2E: Enhance monitoring and response strategies

Primary Project Deliverables

Milestone 1
• October 1, 2008 to April 30, 2009- Coordination, Planning and Training of Volunteers
Milestone 2
• May 1, 2009 to September 30, 2009- Sampling, Analysis and Reporting

Project Financing

Budget	
Award:	\$25,000
Description	Expense
Total Salaries and Benefits	\$15,278
Expendable Supplies & Equipment	\$4,000
Domestic Travel	\$200
Analysis	\$400
Small Boat	\$400
Total Direct Costs	\$20,278
Indirect Costs @ 32.0%	\$4,722
Total Project Costs	\$25,000

Project Critical Success Factors

Outcomes
<p>Short-term: expand citizens' monitoring effort</p> <p>Intermediate: provide additional data sets</p> <p>Long-term: enhance monitoring capabilities of partner programs and agencies</p> <p>Changes in pressure targets: increase in number and type of sampling sites</p> <p>CWA Programs: improve water quality monitoring</p>

External Factors

Impacts
<p>1. External factors discussion None</p> <p>2. CWA Implementation Information None</p>

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name:	Benthic diatoms as indicators of water quality in Delaware's Inland Bays
Responsible Partner	Kathryn J. Coyne, Assistant Professor University of Delaware, College of Marine and Earth Studies 700 Pilottown Rd., Lewes, DE 19958 Phone: 302-645-4236, FAX: 302-645-4007 kcoyne@udel.edu
Grant ID:	CE99399009-1-2009
Status:	On-going (FY2009 Work Plan)

Project Description

Project Overview

Benthic diatoms are excellent indicators of environmental change in aquatic ecosystems and are routinely used to monitor water quality in freshwater ecosystems in the US and Europe (e.g. Potapova and Charles 2007). Diatoms have several attributes which make them ideal for water quality assessments (summarized from McCormack and Cairns 1994):

1. **Diatoms are ubiquitous and biologically relevant.** Diatoms are components of virtually every aquatic habitat and many species are globally distributed. As primary producers, diatoms are also vital members of aquatic ecosystems and function at the interface between biotic and abiotic components of the food web. In addition, diatom assemblages generally contain a large number of species, so that changes in population structure provide an "information-rich" system for ecological analysis.
2. **Diatom assemblages provide excellent continuity through time and space.** Although seasonal changes in diatom populations occur, community-level characteristics are maintained throughout the year. Furthermore, the ubiquity of diatom assemblages within a geographical region provides spatial continuity for fine-scale resolution of environmental impacts.

3. **Diatoms are sensitive to a broad range of environmental stressors over small temporal and spatial scales.** Benthic diatoms have relatively high growth rates and respond rapidly and predictably to alterations in water chemistry. When compared to minimally-impacted reference sites, the ecological conditions of other sites along a gradient are reflected by differences in diatom abundance and diversity.
4. **Diatom indicators provide information about ecosystem health that is complementary to information provided by other indicator organisms.** As direct recipients of increased nutrient loading, changes in diatom community structure are reliable indicators of changes in trophic status. Other commonly used indicators, such as invertebrate and fish populations, respond better to changes in their physical habitat, such as increased sediment loading or temperature.
5. **Sampling protocols for diatoms have little impact on the environment.** While sampling higher organisms may be destructive to the environment or detrimental to indigenous populations, diatom sampling rarely impacts the environment or other trophic levels.
6. **Diatoms indicators are cost effective.** In contrast to indicators species from higher trophic levels, large numbers of benthic samples can be easily collected and rapidly processed for molecular analysis of diatom species.

Although the value of diatom indices for water quality assessment in freshwater ecosystems has long been recognized, recent research has also demonstrated the utility of benthic diatoms as reliable indicators of water quality within marine systems (e.g., Frankovich et al, 2006; Weckstrom and Juggins 2005; Webber et al., 2005; Marshall et al., 2003). In Delaware's Inland Bays (DIB), however, there has been only one study of benthic diatoms, as paleoecological indicators of climate change (Beasley, 1987). This investigation revealed an increase in diatom diatom abundance and decrease in diversity with increased agricultural activities (and nutrient input) over time. In the most recent sediments, Beasley (1987) also identified diatom species indicative of nitrogen pollution with declining oxygen levels. A study of representative salt marsh habitats in nearby Canary Creek, Lewes, DE also investigated the effects of nutrient enrichment on diatom assemblages and found that long-term exposure to nutrient stress resulted in a shift in community structure and a decrease in diatom diversity (Sullivan 1976). These results, along with the considerable amount of data provided in studies on other systems, suggest that diatom assemblages in Delaware's Inland Bays may be useful indicators of environmental conditions over a range of temporal and spatial scales.

Primary Objectives/Opportunity

- Explore the impact of nutrients in structuring benthic diatom assemblages in Delaware's Inland Bays.
- Evaluate tolerance of potential indicator species within diatom assemblages to nutrient input.
- Make recommendations for appropriate diatom indicators to CIB and DNREC.

CCMP/Work Plan Goal

This project satisfies a number of CIB priority Work Plan goals including, (1) facilitating the development of new diagnostic indicators, and (2) enhancing the reliability and presentation of indicator-based decisions regarding environmental quality in the Inland Bays.

Primary Project Deliverables**Milestone 1**

- Analyze archived DNA from sediments, statistical analysis of results (Fall '08)

Milestone 2

- Sequence DNA for species identification (Fall '08/Winter '09)

Milestone 3

- Develop and test high-throughput assays (Winter '09/Spring '09)

Milestone 4

- Collect and analyze sediments from selected sites of interest (Spring '09/Summer '09)

Milestone 5

- Mesocosm experiments (Summer '09)

Milestone 6

- Analyze and evaluate results mesocosm experiments (Summer '09)

Milestone 1

- Write reports, make recommendations for diatom indicator species (Summer '09/Fall '09)

Project Financing**Budget**

Award: \$12,000

Description

Expense

Project Critical Success Factors

Outcomes
<p>Short-term: new Inland Bays environmental indicator</p> <p>Intermediate: increased understanding of Inland Bays ecological and water quality trends; increased understanding and a learning tool for resource managers involved in planning protection and restoration strategies.</p> <p>Long-term: enhance monitoring capabilities of partner programs and agencies</p> <p>Changes in pressure targets:</p> <p>CWA Programs: improve water quality monitoring</p>

External Factors

Impacts
<p>1. External factors discussion None</p> <p>2. CWA Implementation Information None</p>

DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman

Project Report

Executive Summary

Project Name: Eelgrass Planting Project in Delaware's Inland Bays

Responsible Partner Ariane K. Nichols, Environmental Scientist II
Division of Soil and Water Conservation
Shoreline and Waterway Management Section
89 Kings Highway
Dover, Delaware 19901
(302) 739-9921

Grant ID: CE99399009-1-2009

Status: On-going (FY2009 Work Plan)

Project Description

Project Overview

The proposed project involves collecting eelgrass seeds from plants within Virginia's Chesapeake Bay, storing these seeds in a controlled storage tank, and distributing the seeds into areas within the Inland Bays that are deemed likely to support the growth of these seeds. This project would also involve surveying the areas within the Inland Bays that have existing eelgrass beds. Information that will be gathered at these sites will include water depths, salinity, and dissolved oxygen. This information will then be used to determine where the best sites are for establishing new eelgrass beds.

Collection of the seeds would be done manually with human labor collecting the seeds by hand in the spring. Collecting the seeds would be done in coordination with Virginia's SAV restoration program and done in a manner to reduce any damage to the established plants within the Chesapeake Bay.

After the seeds were collected they would be divided into two halves. Half of the seeds would be dispersed in the spring using a floating tethered bag method shortly after the seeds are collected. The other half of the seeds would be placed in a pool and maintained in a cool and dark area to reduce the chances of any algal growth within the pool. This pool

will be located at the Division of Soil and Water Conservations new facility in Lewes, Delaware. These seeds that will be pool kept through the summer will then be broadcast by hand in the fall, shortly before germination of the seeds will occur. Monitoring of the seeds will occur throughout the year to determine the success of the planting efforts.

Primary Objectives/Opportunity

- to increase the population of eelgrass within the Inland Bays
- provide for increased benthic habitat because eelgrass beds provide habitat for juvenile fisheries species.
- to survey the existing eelgrass beds within the Bays and gather information on characteristics of these areas that support the growth of these bed
- to establish a system for eelgrass seed collection, dispersal, and monitoring that will become an annual program within the Department and Division.

CCMP/Work Plan Goal

This project directly correlates with the objectives of the CCMP, Habitat Protection Action Plan. Within this Action Plan it is stated that: “There are presently no substantial SAV beds in the Inland Bays; potential habitat may currently be limited and existing habitat is marginal. For these reasons, and because of other concurrent uses of the Bays, protecting areas where planting is being attempted is both feasible and desirable. If SAV is to become re-established, it must be protected. Healthy SAV beds will become primarily shellfish spawning sanctuaries and finfish nursery areas.”

Within this Action Plan, Implementation of Tactic A states that:

“The purpose of this plan is to develop a strategy for designating sensitive locations in need of protection and for establishing and managing Resource Protection Areas (RPSs).”

From this description of the Action Plan and its Tactic A, the establishment and monitoring of eelgrass beds fits in directly with the Center’s CCMP.

Primary Project Deliverables

Milestone 1

- Late fall/winter 2008 – Survey of existing eelgrass beds

Milestone 2

- Spring 2009 – Collect seeds in Chesapeake Bay, disperse half of the seeds in tethered floating bag method, place half of seeds in a monitored pool

Milestone 3

- Spring/Summer 2009 – Monitor pool with eelgrass seeds

Milestone4
<ul style="list-style-type: none"> Fall 2009 – Hand dispersal of seeds that have been in pool
Milestone 5
<ul style="list-style-type: none"> Fall/Winter 2009 – Monitor seed dispersal areas for germination

Project Financing

Budget	
Award:	\$4,000
Description	Expense
Collection	\$2,000
Equipment	\$2,000

Project Critical Success Factors

Outcomes
<p>Short-term: N/A</p> <p>Intermediate: exploration of an alternative restoration methodology</p> <p>Long-term: restoration of an ecologically significant plant community in the Inland Bays watershed</p> <p>Changes in pressure targets: increase in SAV acreage</p> <p>CWA programs: N/A</p>

External Factors

Impacts
<ol style="list-style-type: none"> External factors discussion None CWA Implementation Information None

FISCAL YEAR 2010 MATCH SOURCES

Source	Amount	Type
State of Delaware- Division of Water Resources	\$132,484	Cash
Private Donations	\$7,000	Cash
Fair-market rental value of Thatcher's Landing Property	\$75,000	In-kind
Fair-market rental value of James Farm Ecological Preserve ²	\$304,516	In-kind
Volunteer Hours ³	\$81,000	In-kind
Total	\$600,000	

1. The Thatcher's Landing Property value was calculated May 2009 by a professional real estate appraiser, based on a fair market value for this 1.6 acre waterfront property. The value of \$75,000 represents part of the total value.

2. The James Farm Ecological Preserve value was calculated by a professional real-estate appraiser, based on fair market values, should the CIB lease the property commercially to support estuary programs; \$ 304,516 represents part of the total value. The James Farm is a 150-acre demonstration and education center. Both watershed and marine science is taught to school groups and adults. The site also serves as a research site for aquaculture techniques and demonstration projects.

3. Volunteer Hours' calculation was provided by EPA Office of Wetlands, Oceans, and Watersheds using Independentsector.org. \$20.25 value represents the year 2008.

ADMINISTRATIVE

Staff Descriptions

The **Executive Director**, under the supervision of the Board of Directors, is the administrative head of the Center charged with the responsibility of the day to day operations and business of the Center, and has responsibilities required by the Inland Bays Watershed Enhancement Act, including but not limited to: 1) Executing policies established by the Board of Directors and its Chairperson; 2) Recommending to the Treasurer and the Board of Directors an annual budget showing anticipated receipts & expenditures; 3) The selection, employment, control and discharge of Center employees, and the development and maintenance of personnel policies that are compatible with the educational purpose of the Center; 4) Carrying out procedures (including audits) approved by the Board to insure that the funds are collected and expended effectively; 5) Serving as a liaison to assure effective communication among the members of the Board of Directors, its various committees, and the staff; and, 6) Performing such other functions as may be delegated by the Board of Directors or its Chairperson, and to conduct, in conjunction with the Chairperson, general overall supervision of the business and affairs of the Center.

The **Administrative Assistant** provides program and office administrative services including development, reconciliation, and tracking of the operation budget; managing payroll and benefits packages; managing financial requirements for federal, state, and local assistance awards; maintaining membership and mailing lists; answering phones; drafting general letters and correspondence; ordering basic supplies; faxing; copying; maintaining program calendars and scheduling; filing; mailing; processing and tracking paperwork for staff travel authorizations and reimbursements; taking minutes of meetings; and other duties as assigned by the Executive Director.

The **Education and Outreach Coordinator** serves the Executive Director of the Center for the Inland Bays by managing the activities of the Inland Bays Comprehensive Public Participation and Education Plan component of the Inland Bays Comprehensive Conservation and Management Plan. The Education & Outreach Coordinator plans the composition of, edits, and produces the quarterly newsletter and annual report; develops other informational publications including brochures, technical reports, and issue papers; Develops, schedules and conducts outdoor learning activities at the James Farm Ecological Preserve; programs integrate Inland Bays education with current Delaware Science Content Standards and Performance Indicators; Hires, trains and supervises Seasonal Instructors assisting with school programs activities at the James Farm Ecological Preserve; Composes press releases, news advisories, calendar announcements, and public service announcements (PSAs) for distribution by local media outlets; Designs and maintains Center for the Inland Bays' web site; responsible for all audio/visual applications for the Center for the Inland Bays, Inc.; Solicits, identifies, develops, and submits grant proposals to pursue financial assistance to fund educational, demonstration, and research projects sponsored by

CIB; manages grant funded projects (ie. Schoolyard Habitat Coordinator) as awarded; Conducts public outreach and educational presentations on Inland Bays issues for citizens groups, adult learning groups, and service organizations in the Inland Bays watershed; Provides in-service training for Delaware educators in the areas of estuarine science, ecology, land use, and environmental impacts; Plans, organizes, and conducts annual events as well as other special events (egs. Volunteer Reception, Native Plant Sale); Attends to a variety of special support projects as assigned by the Executive Director.

The **Habitat Coordinator** serves the Executive Director by managing the Habitat Protection Action Plan component of the Inland Bays Comprehensive Conservation and Management Plan. Primary responsibilities include the development and implementation of a watershed-wide habitat restoration plan which includes developing a plan consistent with the goals of the Comprehensive Conservation and Management Plan (CCMP) and development of programmatic infrastructure to secure funding and oversee project implementation to meet the goals stated in the plan; coordinating program and planning efforts of federal, state, county, and local governmental agencies and other non-governmental agencies and groups related to habitat and habitat restoration within the watershed with an emphasis on keeping Inland Bays habitat and environmental issues at the forefront of other agency/group planning and consideration; representing the CIB at meetings convened by federal, state, county, and local governmental agencies and other non-governmental agencies and groups for the purposes of addressing Inland Bays and other environmental issues, which include, but are not limited to the Sussex County/DelDOT Transportation Plan Committees, USDA-Delaware State Technical Committee and related subcommittees. Soliciting, identifying and developing grant proposals to pursue financial assistance to fund habitat restoration projects sponsored by the CIB; managing grant funded projects as awarded; Serving as liaison to the Citizens Advisory Committee, which includes preparing and announcing meeting agendas, facility preparation, and scheduling regular meetings; Submitting regular habitat and special topic articles to the Education and Outreach Coordinator for the quarterly newsletter and other program publications, including brochures, technical reports, and issue papers; Developing and submitting press releases related to habitat to the Education and Outreach Coordinator for local media distribution, as necessary; Submitting information to the Education and Outreach Coordinator for use on CIB's web site, and CIB tracking system; Planning and developing topics of interest for participation in weekly radio broadcasts as scheduled; Attending to a variety of special support projects and other duties as assigned by the Executive Director.

The **Restoration Coordinator** serves the Executive Director and works in conjunction with the Habitat Coordinator to implement actions in the Habitat Protection Action Plan; The Restoration Coordinator manages and oversees the day to day operation of the James Farm Ecological Preserve; monitors the James Farm Ecological Preserve for various wildlife activities, identifying key animal and plant species as a base line for future comparative studies and also for comparison to historical data; replenishes species by learned management techniques; helps to coordinate internships at the Center for the Inland Bays; manages the Inland Bays Shellfish Restoration Program, including the oyster gardening program; coordinates with the State Forest Service to implement the Urban and Community Forestry Program in the Inland Bays watershed; represents the Center on committees

including the State Forestry Council; participates in public relation/outreach activities sponsored by the CIB; represents the CIB at meetings convened by county, state, and federal agencies or organizations for the purposes of addressing Inland Bays and other environmental issues.

The **Science and Technical Coordinator** serves the Executive Director and has the primary role in formulating the research and demonstration project agenda for the Center for the Inland Bays. The Science Coordinator monitors existing research projects and provides guidance on future and potential research projects; Analyzes existing data and provides guidance and consultation on Inland Bays issues related to science and management; Prepares scientific reports and documents as needed; Assists staff and CIB committees with science guidance; Develops and fortifies the CIB tracking system of the Comprehensive Conservation and Management Plan; Procures grants relative to science program priorities; Performs other duties as assigned by Executive Director.

The **Development Coordinator** serves the Executive Director and is responsible for planning, coordinating and implementing the financial plan for the CIB, which includes building and maintaining relationships and securing financial support from current and prospective donors. This individual will also plan and coordinate special events activities. Principal duties and responsibilities include increasing "Friends of the Bays" memberships, organizing mailing lists, identifying donor base, developing prospect research tools, cultivating individual and corporate donors, managing the CIB's endowment fund and annual campaigns, developing, organizing and marketing programs and annual events to the community and target audiences, and identifying and pursuing grant funding opportunities.

BOARD OF DIRECTORS

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The **CENTER FOR THE INLAND BAYS (CIB)** is a private, non-profit organization dedicated to promoting the wise use and enhancement of Delaware's Inland Bays and associated watersheds. The CIB was established by the Delaware General Assembly in 1994 under the auspices of the Inland Bays Watershed Enhancement Act and is administered by the U.S. EPA's National Estuary Program.

CENTER FOR THE INLAND BAYS

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DELAWARE



Limulus polyphemus

CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman