



DELAWARE CENTER FOR THE  
**INLAND BAYS**  
Research. Educate. Restore.

Center for the Inland Bays  
FY2016 Annual Progress Report and FY2017 Annual Work Plan

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## Implementation of the Delaware Inland Bays CCMP

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### Abstract

The Center presents the following completed projects from the FY2016 workplan and presents the following on-going and new projects for its FY2017 workplan. These projects implement various CCMP actions and may include but are not limited to the following:

### Completed

2012 Center for the Inland Bays Facility Systems Replacement Plan and Financial Consultation

### Ongoing

Gardening for the Bays Native Plant Sale

Inland Bays Clean Up

James Farm Master Plan Implementation Phase I

Migratory Fish Passage Designs for Dams on the Tributaries of the Inland Bays

2015 Center for the Inland Bays Financial Plan

Bio-enhancement to Improve Estuarine Habitat and Water Quality of Poorly-Flushed Residential Canals

Inland Bays CCMP Project Management and Oversight

Anchorage Canal Drainage Area Stormwater Retrofit Demonstration -- Sandpiper Pines Bioretention Areas and Infiltration Trenches

Financing for Clean Water Outreach Campaign

Management of the James Farm Ecological Preserve

CIB General Brochure

Assessment and Progress Report on the 2008 Inland Bays Pollution Control Strategy

2016 'State of the Inland Bays' report

Your Creek

### Proposed

Watershed Reforestation

Environmental Monitoring

Shellfish Enhancement

Anchorage Canal Drainage Area Retrofit Project Wetland Wetpond

Microbial Source Tracking, Love Creek

Living Shoreline Initiative

Broad, Risked-Based Climate Change Vulnerability Assessment of the Inland Bays CCMP

Childhood Education

Dewey Beach Stormwater Master Plan Phase II

Stockley Center Stormwater Pond Retrofit

## Implementation of the Delaware Inland Bays CCMP

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The Center presents the following completed projects from the FY2016 workplan and presents the following on-going and new projects for its FY2017 workplan. These projects implement various CCMP actions and may include but are not limited to the following:

Proposed

Inland Bays CCMP Revision

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## 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 2017 (October 1, 2016 through September 30, 2017). The focus of this Work Plan is the implementation of the Delaware Inland Bays Comprehensive Conservation and Management Plan via research, demonstration, education/outreach, and habitat restoration 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 mission of the Center is:

To preserve, protect and restore Delaware's Inland Bays, the water that flows into them, and the watershed around them.

The goals of the Center are:

1. To facilitate the wise use and enhancement of the Inland Bays' Watershed through the coordinated implementation of the Inland Bays Comprehensive Conservation and Management Plan.
2. To provide a forum where science supports public education and decision making regarding the Inland Bays Watershed.
3. To foster a collaborative, consensus-building culture among watershed stakeholders crucial to support research, education, protection and restoration initiatives, and policy decisions.

## Fiscal Year 2016 Accomplishments Summary

(OCT 01, 2015 to MAY 15, 2016)

### SCIENCE & RESTORATION

This year the Center added an environmental scientist to its staff, Andrew McGowan, who will manage environmental monitoring programs and oversee data analyses and GIS work. The Center has worked hard in FY 2016 to make up for delays in environmental monitoring projects that were caused by earlier staffing shortages and the unexpected death of one of our Citizen Science program leaders in 2015. The update of the Inland Bays Monitoring Plan experienced delays; the consulting firm RK&K was brought on board to assist with its completion. Our two citizen science programs - the Shorezone Fish Community Volunteer Monitoring Program and the Annual Inland Bays Horseshoe Crab Survey and Tagging Project –are in their 6th and 9th years, respectively, and a priority this year has been analysis and reporting of trends in the data collected from each. Repairs of equipment at our long-term continuous salt marsh monitoring stations were made with contracted assistance from DNREC's Wetland Assessment staff, and data collection is on track. The Center provided financial assistance to allow the University of Delaware's Citizen Monitoring Program (CMP), which has staff and funding shortages, to contract out analyses of nutrient samples collected at ten key stations in the Inland Bays. The long-term nutrient, dissolved oxygen, and bacteria data collected from these stations has provided important expanded coverage of tributaries in development of water quality indicators for the Bays. A 'State of Love Creek' report was completed in 2015, and a 'State of Dirickson Creek' report will be completed in June and sent to STAC for review. The indicators for both creeks show significant and accelerating development of forested and agricultural land, and consistent failure to meet water quality standards for nutrients and bacteria, particularly in the upper portions of the streams. The Center partnered with the DNREC Environmental Laboratory this spring to design a microbial source tracking study in Love Creek.

In 2015, the project entitled, Bio-enhancement to Improve Estuarine Habitat and Water Quality of Poorly-Flushed Residential Canals, deployed 200 bushels of adult oysters in floating cages and floating wetland islands to research their ability to improve water clarity and dissolved oxygen concentrations in a poorly-flushed residential canal. A year of continuous water quality data has already been collected from the project and is showing small, but significant WQ improvements. The oysters have survived better than expected. The project will continue through October 2016. Progress was made on two stormwater retrofit projects in the Anchorage Canal watershed. Construction began this spring on a set of bioretention areas and infiltration trenches at Sandpiper Pines, and funding was approved through the state's Transportation Alternatives Program to design and construct a stormwater wetland/pond along Coastal Highway south of Bethany Beach. Design work will begin in June. Together the two projects will prevent 7 lbs./year of phosphorus and 36 lbs./year of nitrogen from entering Little Assawoman Bay. The Center's Living Shoreline(LSL) Initiative is creating a series of demonstration projects in the Inland Bays. A LSL Siting and Concept Design Plan will be completed by mid-summer to select and design the projects to permit level. The 2,000 bushels of recycled oyster shell 3,000 adult oysters produced annually by our shell recycling and oyster gardening programs will be incorporated into some of these LSL projects. Funding was recently secured for a LSL project at the Banks Harbor Marina on White Creek, and site characterization and design work began on it this spring. Other habitat restoration accomplishments in 2016 include reforestation of 17.5 acres of former agricultural land at the Angola Neck and Poplar Thicket reserves, and continued management and enhancement of the James Farm Preserve. Conceptual design work also was completed on a 70-foot Alaskan Steeppass Fishway at Burton Pond.

## WATERSHED COORDINATION

The Watershed Coordinator hired in 2016 allowed for enhanced partner coordination and grant writing for CCMP implementation. Assessment of the implementation of the Pollution Control Strategies is underway. The partnerships created through this assessment allowed leverage of grant resources to implement two nutrient management projects that will result in direct nutrient reductions. Beginning in FY2016 and spanning into FY2017, the Center will be implementing a stormwater retrofit from a wet pond to a bioretention pond at the Stockley Center as a result of leveraging the EPA operating grant to secure State grant funds. In addition, the Center will be coordinating efforts to develop a stormwater master plan for nutrient reductions in the Town of Dewey Beach. This project is fully funded through a State grant, but meets nutrient management and control activity goals.

## EDUCATION AND OUTREACH

In 2016, we increased the capacity of our Education and Outreach program with the hire of a Communication Specialist, greatly expanding our social media presence and creating opportunities to explore new digital media strategies. With the re-organization of our staff last year, we have a much more robust team approach that includes education and outreach planning at the front end of every project. This allows us to identify communications and education opportunities and carry out the strategy in tandem with the project implementation.

An important focus of our Education and Outreach program is to meet the challenge of reaching and engaging the huge influx of new residents who have moved here in the last decade. The Your Creek initiative is proving to be a successful model for engaging citizens where they live by introducing homeowners to their local creek. The initiative has brought in motivated new volunteers who are taking leadership in their creek communities to educate their neighbors and recruit others to participate in citizen science and community outreach in their creek watershed.

We continue to reach over 2,000 visitors to our coastal resort area each year through our partnership with the Bethany Beach Nature Center where we provide resources for their watershed education programs and events. We are in the 17th year of our James Farm Middle School Program, a partnership with Indian River School District to provide a full day of hands-on/waders-on outdoor learning experiences to 1,000 7th and 8th grade students who attend our spring and fall programs. This year we completed our second two-day Living Shorelines Workshop and trained 34 participants.

## ADMINISTRATIVE

Administrative improvements included continued staff restructuring and the completion of the 2012 Facility Systems Replacement Plan and Financial Consultation. This resulted in a final organizational budget that was program based and included an integrated indirect cost rate. The budget transfers responsibility and understanding of budgeting towards the Center's Programs and includes project level budget detail that condenses to program and organizational level budgets. Other financial recommendations are now being pursued including time and effort tracking and reporting.

## Major Project Changes from the FY2016 Workplan

The following is a summary of major project changes from the FY2016 CIB Workplan to the EPA. It is common occurrence that a small percentage of the total CCMP projects intended for implementation during a given Fiscal Year are either altered significantly in their scope or cancelled due to a number of unforeseen circumstances.

This year's workplan submittal takes a different approach in an effort to reduce the excessive size of the workplan and the excessive time and costs to produce it. Here many projects presented individually in previous workplans are included along with new efforts of similar scope under larger project initiatives, still referred to and reported as 'proposed' projects. Other previously listed projects will remain as before, because they do not lend themselves to folding in with others into larger overall projects. A project crosswalk between the FY2016 and FY2017 plans is provided below followed by a discussion of cancelled projects and major funding reallocations.



<b>FY16 Project Name</b>	<b>Status</b>	<b>FY17 Project</b>
Gardening for the Bays Native Plant Sale	Ongoing	Gardening for the Bays Native Plant Sale
Long-term continuous saltmarsh monitoring in the Inland Bays	Ongoing	Environmental Monitoring
Shellfish Enhancement Action Plan	Ongoing	Shellfish Enhancement
Angola Neck Reforestation Project	Ongoing	Reforestation
Poplar Thicket Upland Habitat Restoration Project	Ongoing	Reforestation
Middle Island Restoration Project	Cancelled	
Bethany Beach Nature Center	Ongoing	Childhood Education
Shorezone Fish Community Volunteer Monitoring Program	Ongoing	Environmental Monitoring
Inland Bays Cleanup	Ongoing	Inland Bays Cleanup
Oyster Gardening Program	Ongoing	Shellfish Enhancement
Annual Inland Bays Horseshoe Crab Survey and Tagging Project	Ongoing	Environmental Monitoring
CIB Speakers Bureau	Ongoing	CIB Speakers Bureau
Living Shoreline Training	Completed	
Oyster Shell Recycling Program	Ongoing	Shellfish Enhancement
James Farm Master Plan Implementation Phase I	Ongoing	James Farm Master Plan Implementation Phase I
2015 Center for the Inland Bays Financial Plan	Ongoing	2015 Center for the Inland Bays Financial Plan
James Farm Middle School Program	Ongoing	Childhood Education
Bio-enhancement to Improve Estuarine Habitat and Water Quality	Ongoing	Bio-enhancement to Improve Estuarine Habitat and Water Quality
Inland Bays Monitoring Plan	Ongoing	Environmental Monitoring
Inland Bays CCMP Project Management and Oversight	Ongoing	Inland Bays CCMP Project Management and Oversight
Your Creek	Ongoing	Your Creek
Migratory Fish Passage Designs for Dams on the Tributaries of the Inland Bays	Ongoing	Migratory Fish Passage Designs for Dams on the Tributaries of the Inland Bays

FY16 Project Name	Status	FY17 Project
Anchorage Canal Drainage Area Stormwater Retrofit Demonstration -- Sandpiper Pines Bioretention Areas and Infiltration Trenches	Ongoing	Anchorage Canal Drainage Area Stormwater Retrofit Demonstration -- Sandpiper Pines Bioretention Areas and Infiltration Trenches
Financing for Clean Water Outreach Campaign	Ongoing	Financing for Clean Water Outreach Campaign
Management of the James Farm Ecological Preserve	Ongoing	Management of the James Farm Ecological Preserve
CIB General Brochure	Ongoing	CIB General Brochure
Assessment and Progress Report on the 2008 Inland Bays Pollution Control Strategy	Ongoing	
2016' State of the Bays' report	Ongoing	
Ambient Water Quality Monitoring	Ongoing	Environmental Monitoring
Ecological and Economic Benefits of Living Shorelines White Paper	Ongoing	Living Shorelines Initiative
Living Shorelines Project Siting and Concept Design Study	Ongoing	Living Shorelines Initiative
Living Shoreline Demonstration Project #2 (Bank's Harbor Marina)	Ongoing	Living Shorelines Initiative
Shoreline Condition Assessment of Little Assawoman Bay & Update of Indian River Bay Assessment Data	Cancelled	

### CANCELLED PROJECTS

CIB Speakers Bureau – This project was ‘cancelled’ because the actions of the Bureau were not significant enough in themselves to require separate reporting. The Speakers Bureau is not really a project, but one vehicle for reaching our audiences that is employed for many of our projects. As one of our 'outreach activities,' all speaking engagements are 'tracked' on the Outreach Activities section of our database and reported quarterly the BOD and EPA.

Middle Island Restoration Project – This project was cancelled due to an inability to develop funds for implementation. Projected costs based on evolving design continued to rise and may now be excessive given potential available funding from the State. This year the Board of Directors as supported by the Water Use Plan Implementation Committee and Center staff educated decision makers about legislation that had been introduced to the Delaware General Assembly at the time of this report which would generate funding for waterway management projects such as this. If this bill passes funding may become available. However, the current fiscal climate of the state does not bode well for implementation of the project in the near future.

Shoreline Condition Assessment of Little Assawoman Bay & Update of Indian River Bay Assessment Data – State Wetland Program Development Grant funding was not able to be obtained for this project. This was the priority funding source and no other sources have been identified. This portion of the Center’s Living Shoreline Initiative will be placed on hold until the next round of State Wetland Program Development Grant Funding can be applied for or other likely sources of funding can be identified.

MAJOR PROJECT FUNDING REALLOCATIONS

Within the FY2015 EPA Grant, \$10,000 in project funding was reallocated from the Migratory Fish Passage Designs for Dams on the Tributaries of the Inland Bays to the Inland Bays Monitoring Plan.

## Fiscal Year 2017 Workplan Summary

### CCMP GOALS

Focus will continue this year on Managing Living Resources and their Habitat with work towards Objective 2. Halt the continued loss of wetlands and reverse these loss trends by promoting projects to mitigate for previously lost wetlands, Objective 3. Provide access for native migratory fish to upstream areas for use as spawning and/or nursery sites, and Objective 5. Increase the economic and environmental benefits of shellfish. Outreach and Education Focus Area will continue to focus on Objective 5. Communicate environmental results to inform legislators and raise citizen awareness about the state of the Inland Bays and its watershed through communication of the 2016 State of the Bays Report, PCS Progress Report, and State of Creek Reports. Planning for Climate Change will receive attention through the CCMP Climate Vulnerability Analysis. The Center's Watershed Coordinator will, through her general program activities, continue Coordinating Land and Water Use Decisions (Objective 1) and continue to address Water Quality Management by continuing work on Objective 2.

### AREAS OF SPECIAL INTEREST

#### NUTRIENT MANAGEMENT AND CONTROL ACTIVITIES

The Shellfish Enhancement Action Plan that will be completed this year will identify and prioritize projects for creation of oyster reefs and living shorelines that establish or enhance bivalve shellfish populations in the Bays. These will result in increased nitrogen removal from the water column via denitrification and assimilation into the biomass of oysters and associated fauna. A Living Shoreline Siting Plan completed in 2016 provides permit-level concept designs for six new demonstration projects in the watershed that will restore and enhance marsh shorelines with associated nutrient sequestration and denitrification.

A number of implementation projects will be continued or initiated this year that will result in direct nutrient reductions. A living shoreline demonstration project at Banks Harbor Marina will be completed, and at least two additional demonstration living shoreline projects will be begun. These will have direct benefits for the maintenance and increase of nutrient storage and removal services of recreated marshes that will be quantified based on project design. Stormwater BMP retrofits are being implemented in the Anchorage Canal drainage area and at the Stockley Center. Each will have nutrient and sediment removal rates associated with the specific design. Reforestation projects at Angola Neck and Bullseye-Ferry Landing Preserve will have also direct nutrient reduction benefits through the replacement of cropland with forest. All reductions for nitrogen and phosphorus directly resulting from projects are reported in the individual project descriptions by year as estimates are generated.

#### CLIMATE RESILIENCE

The Center's Living Shoreline Initiative is promoting use of green infrastructure to maintain and restore natural shorelines along the inland Bays. These management techniques will provide greater resiliency to tidal marsh resources through reduction of wave energy and storm surges and mitigation of wetland losses elsewhere in the watershed. Living shoreline management techniques promote the concept of dynamic shorelines that can migrate inland with sea level rise, albeit more slowly than shorelines eroding under unmanaged conditions. Long-term continuous monitoring of saltmarshes around the Bays will continue to develop information on the site-specific rates of marsh elevation change relative to sea-level that can inform planning for marsh restoration projects and overall estuary management under conditions of wide-spread marsh drowning due to sea level rise. Finally, in 2017 the Center is taking action on climate change through a broad, risk-based climate change vulnerability analysis of the Inland Bays CCMP.

## SUMMARY

### SCIENCE & RESTORATION

Work will continue in FY 2017 on a Living Shorelines Initiative, with emphasis on construction of demonstration sites, science synthesis, public outreach, and contractor training. The Living Shoreline Siting and Concept Design Plan completed last year, and the Shellfish Enhancement Action Plan to be completed this year, providing project concepts that can be used to apply for supplemental grant funding for implementation. We anticipate being able to begin implementation of two additional living shoreline demonstrations and an oyster reef project in FY 2017. Design work will continue for implementation of the James Farm Master Plan and eel passes to be installed at three dams. The Center's oyster shell recycling and oyster gardening programs are successfully producing considerable quantities of cultch and adult oysters for use in restoration projects in the Bays. Continued expansion of both programs is a goal in 2017. Funding will be sought to install a fish ladder at Burton Pond for which a concept design was completed in 2016.

Ongoing wetlands monitoring and citizen science programs will continue to provide long-term data for use in developing indicators of estuary health and analyses of trends. Outreach around the new State of the Bays report, due in September 2016, will occur, and individual creek indicator reports will support the Your Creek project. The Center will conduct a strategic planning exercise to expand and enhance Citizen Science programs in the Inland Bays.

### WATERSHED COORDINATION

Beginning in FY2016 and spanning into FY2017, the Center will be implementing a stormwater retrofit from a wet pond to a bioretention pond at the Stockley Center as a result of leveraging the EPA operating grant to secure State grant funds. In addition, the Center will be coordinating efforts to develop a stormwater master plan for nutrient reductions in the Town of Dewey Beach. This project is fully funded through a State grant, but meets nutrient management and control activity goals. A CCMP Climate Vulnerability Assessment and CCMP Update will also be accomplished in 2017.

### EDUCATION & OUTREACH

A major initiative for FY17 is the watershed-wide campaign to make 'living shorelines' a household phrase through the Living Shorelines Initiative. In 2017 we will roll out a comprehensive outreach initiative using social and traditional media, special events, community presentations, a mass mailing and exhibits, all designed to reach and educate both shoreline homeowners, and the professionals they hire to advise them on eroding shorelines.

This year, we take our Your Creek initiative to Vines and Pepper Creeks. With lessons learned on Love Creek and Dirickson Creek, we will build a creek team and provide them with the training and resources to make friends for their creek, educate their neighbors, and advocate for water quality.

Our Childhood Education program will continue to serve the middle school students in our watershed who reside mostly in the interior west of our bays, and it is an important education outreach to our large and growing Hispanic population. This year, more than 2,000 visitors to our coastal towns will learn about the Inland Bays through our partnership with the Bethany Beach Nature Center. For all the new property owners arriving every day, our annual Gardening for the Bays Native Plant Sale will celebrate thirteen years of turning new arrivals into Gardeners for the Bays.

## COMPLETED PROJECTS

## 2012 Center for the Inland Bays Facility Systems Replacement Plan and Financial Consultation

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Chris Bason

Primary Project Partner Contacts:

Pamela J. Babuca, Project Manager, Studio JAED, Systems Replacement Plan Contractor

James G. Little, Associate, Your Part-Time Controller, Financial Consulting Contractor

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Wastewater Management	1	C	
Administration	2	A	

#### Project Overview:

In 2006, the Center for the Inland Bays moved its offices to its Indian River Inlet Facility. The 5,000 square foot building was repurposed from an unused US Coast Guard barracks to a green demonstration facility to house the Center's operations and employees. The facility is 80% powered by renewable energy and it demonstrates recycled products and best management practices for water quality and wildlife habitat. As the building approaches ten years in age, its many systems are beginning to demonstrate the need for repair and replacement. To project for and secure the funds necessary to maintain the facility's systems in advance of their needs, the Center must quantify the costs of and plan for their expenditures. The Center will solicit and secure the services of a financial consultant to produce a Systems Replacement Plan for the facility that will detail the costs necessary to maintain the facility and project when those costs can be expected to be incurred based on the normal life of individual systems, such as solar panel and heating and cooling systems. The plan will guide the development, budgeting, and investment of maintenance funds for the life of the facility. This will allow to Center to conduct operations in an orderly and sustainable fashion without disruptions to work and will ultimately reduce overhead costs. The Center will also use the services of the consultant to advise the Center management on improving its operational budgets, budgeting process, and presentation of program finances. The Center has not significantly revised its budgets and budgeting process for over a decade, despite major growth of the organization. This consultation will result in a more efficient budgeting process and better financial planning and expression of finances. It is anticipated that this will improve the impressions of potential private donors and foundations to increase funding from these sources for CCMP implementation.

#### Outputs/Deliverables:

1. Systems replacement plan for the Indian River Inlet Facility.
2. Recommendations for improvement of organizational budgets and budgeting process.

**Intermediate Outcomes:**

1. Increased capacity to develop and invest funds for the maintenance of the systems of the Indian River Inlet Facility in advance of their needs.
2. Clearer and more efficient budgets and organizational budgeting process.

**Long-Term Outcomes:**

1. An adequately and sustainably maintained facility to support Center operations.
2. Reduced overhead costs for the Center.
3. Improved expression of organizational finances.
4. Increased revenue to support CCMP implementation.

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
DNREC	FY2015 DNREC Operating Grant	STATE-0000253060	\$ 6,916.80	\$ 0.00	\$ 6,916.80
EPA	FY2012 EPA NEP Operating Grant	CE993990-11-0	\$ 15,000.00	\$ 0.00	\$ 15,000.00
Totals:			\$ 21,916.80	\$ 0.00	\$ 21,916.80

**PROJECT PROGRESS**

Beginning Date: 08/01/2014                      Project Status: Completed

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Systems Replacement Plan (SRP) RFP Prepared.	Completed	05/25/2015	03/01/2015			
Potential Consultants Identified.	Completed	05/25/2015	05/01/2015			
SRP Consultants Selected.	Completed	05/25/2015	06/01/2015			
Financial Consultant Selected.	Completed	05/25/2015	07/01/2015			
SRP Completed.	Completed	05/25/2015	10/01/2015			
Financial Consultation Completed.	Completed	05/25/2015	11/01/2015	01/01/2016		
Financial Recommendations Implemented.	Initiated	05/25/2015	12/30/2015	02/01/2016		

**Annual Report:**

The completed system replacement plan continues to be implemented. It was determined through consultation with the budgeting contractor, YPTC, that major replacement costs could not be integrated into an indirect cost rates but should instead be budgeted for as capital projects. Deferred maintenace items identified by the system replacement plan continued to be implemented during FY2016.



**Annual Report:**

YPTC developed a suite of financial systems recommendations including 1) guidelines for an integrated and program based organizational budget and budget projections, 2) contracting out of payroll services, 3) a method for integrating an organizational indirect rate into budgeting, 4) staffing alternatives for the turnover in the Administrative Assistant position, and 6) options for time and effort tracking and reporting software.

A final organizational budget that was program based and included an integrated indirect cost rate was completed in May of 2016. The budget transfers responsibility and understanding of budgeting towards the Center's Programs and includes project level budget detail that condenses to program and organizational level budgets. The decision was made to delay application of a federally approved indirect rate until after FY2016 to avoid using financial data from the irregular year FY2015 during which indirect costs were not representative of a normal year. The contractor prepared a draft cost policy statement for application for a federally approved indirect rate that will be used in FY2017. The Center's accounting system was upgraded to support the new budget and funds were set aside to upgrade the system to a cloud based version. An Office Manager position with increased accounting responsibilities was developed to replace the Administrative Assistant position after the retirement of that position at the end of the fiscal year.

An unexpected increase in the time and effort of the Executive Director, Administrative Assistant, Administrative Specialist, and Program Coordinators was necessary to complete the project and this transferred time and effort from other projects. Notably, little intended progress was made on the Center's Finance Plan. In the end, this project resulted in a great success in terms of financial reorganization for the organization to better plan and communicate its finances to its Board, staff, and supporters. Consultation recommendations, including an indirect cost rate application and time and effort tracking, will be implemented in FY2017. Although the intention of the project was to reduce overhead costs in the future, it is likely that costs will stay the same or increase due to needs for software and staff time for time and effort reporting. This is more a function of the reporting requirements and less the recommendations of the project itself. The project is likely to result in continued increases in revenue as intended due to 1) an increased capacity of the Center to communicate its financial position and strategy and 2) improved capacity of program staff to plan and implement their income and expenses.

## ON-GOING PROJECTS

## 2015 Center for the Inland Bays Financial Plan

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Chris Bason

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Administration	2	A	

#### Project Overview:

Per the 2009 and 2013 EPA Program Evaluation of the Center, the EPA has required production of a Finance Plan that addresses ways to diversify the Center's funding sources. The Center will utilize the time of the Executive Director, the Center's Marketing and Development Coordinator, and Board Members to produce such a plan. The development of the Plan will explore funding sources for CCMP implementation and the long term financial sustainability of the Center itself. Existing and new funding sources will be ranked according to their potential for maintenance and growth based on criteria to be developed by the project participants. The Finance Plan will integrate the Center's Private Fundraising Plan. Work on the plan will begin in FY2015 and will be completed by OCT 1 2015. The plan will be an in-house document of the Center and will not receive professional design and production. During FY2015 and FY2016, this project experienced delays due to unexpected shifts in priorities that did not allow effort to be devoted towards it. The completion schedule was extended into FY2017.

#### Outputs/Deliverables:

1. Finance plan guiding diversification of Center funding sources.

#### Intermediate Outcomes:

1. Increased participation from Board Members in supporting diversification of funding sources for CCMP implementation and Center financial sustainability.

#### Long-Term Outcomes:

1. Increased finances for CCMP implementation.
2. Diversification and of Center funding sources.
3. Improvement in Center financial sustainability.

#### Clean Water Act Programs:

Controlling Nonpoint Source Pollution on a Watershed Basis

## PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2015 EPA NEP Operating Grant	CE-993990-12-1	\$ 18,843.00	\$ 0.00	\$ 18,843.00
Totals:			\$ 18,843.00	\$ 0.00	\$ 18,843.00

## PROJECT PROGRESS

Beginning Date: 10/01/2014

Project Status: Ongoing "Major Delays"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Research financial sustainability.	Completed	05/08/2014	09/01/2014			
Conduct Interviews with Board Members on finances.	Not Initiated	05/08/2014	11/01/2014	07/30/2015	01/01/2017	
Develop list of existing and new potential funding sources	Initiated	05/08/2014	03/01/2015	08/30/2015	06/01/2016	12/01/2016
Draft report completed	Not Initiated	05/08/2014	08/01/2015	09/15/2015	07/01/2016	01/01/2017
Final report completed	Not Initiated	05/08/2014	10/01/2015	10/01/2015	09/30/2016	03/01/2017

## Annual Report:

Little progress has been made on this project due to competing organizational priorities such as hiring, staff development, increased effort on the 2012 Center for the Inland Bays Facility Systems Replacement Plan and Financial Consultation project, and increasing grant requirements (e.g. workplan revision and review, preparation for CCMP climate vulnerability analysis). Research into funding sources continues. The project milestones have been extended to allow more time for project completion.

## 2016 'State of the Inland Bays' report

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Marianne Walch

#### Primary Project Partner Contacts:

Scott Andres, Senior Scientist, Delaware Geologic Survey, Data provider and reviewer

Andrew Homsey, Gis Services Manager, University of Delaware -- Institute for Public Administration, Water Resources Agency,

Robert Palmer, Division Director, DNREC -- Division of Watershed Stewardship, Data provider and reviewer

Ed Whereat, Program Coordinator, University of Delaware -- College of Earth, Ocean, and Environment, Data provider

#### Supporting Project Partner Contacts:

David Saveikis, Division Director, DNREC -- Division of Fish and Wildlife, Data provider

Virgil Holmes, Division Director, DNREC -- Division of Water, Data provider

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Outreach and Education	5	A	

#### Project Overview:

A suite of indicators were selected by the Indicators Subcommittee of the Inland Bays Scientific and Technical Advisory Committee. These were selected based on their usefulness to provide the following:

- Evaluate progress in the Inland Bays restoration effort;
- Monitor environmental condition and environmental response to restoration efforts;
- Provide information needed to establish restoration goals;
- Regularly inform and involve the public in achieving the restoration goals; and,
- Make detailed information and reference data available to others.

These indicators are used by the Center to produce a 'State of the Inland Bays' report, which, in part, assesses progress toward meeting the goals of the CCMP. The next report is due to be published in 2016. Indicators will be presented, in an accessible format, to show status and trends in watershed condition, nutrient loads and management, water quality, living resources, pathogens and contaminants, and climate. Writing of the 2016 State of the Bays report will be led by the CIB Science and Restoration Coordinator, with assistance from other CIB staff, and the STAC.

#### Outputs/Deliverables:

1. '2016 State of the Inland Bays' report.
2. Press event to announce the report's publication.

Long-Term Outcomes:

1. Assessment of progress toward achieving goals of the Inland Bays CCMP.
2. Assessment of progress toward achieving goals of the Inland Bays Pollution Control Strategy and meeting TMDLs for nitrogen, phosphorus and bacteria.
3. Update and calibration of Inland Bays water quality and hydrodynamic models.

Clean Water Act Programs:

Improving Water Quality Monitoring

Strengthening National Pollutant Discharge Elimination System Permits

Strengthening Water Quality Standards

Identifying polluted waters and developing plans to restore them (total maximum daily loads)

Clean Water Act Program Implementation Role: Primary

PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
DNREC	FY2016 DNREC Operating Grant		\$ 8,435.00	\$ 0.00	\$ 8,435.00
EPA	FY2016 EPA NEP Operating Grant		\$ 38,049.00	\$ 0.00	\$ 38,049.00
EPA	FY2017 EPA NEP Operating Grant		\$ 5,174.37	\$ 0.00	\$ 5,174.37
Totals:			\$ 51,658.37	\$ 0.00	\$ 51,658.37

PROJECT PROGRESS

Beginning Date: 10/01/2015 Project Status: Ongoing "On Track"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Indicators and trends compiled.	Initiated	05/26/2015	03/01/2016	05/30/2016		
Draft report written.	Initiated	05/26/2015	06/30/2016			
Final report printed.	Not Initiated	05/26/2015	08/31/2016			
Press event to announce the 2016 report release.	Not Initiated	05/26/2015	09/30/2016			

Annual Report:

Data for the 2016 State of the Bays report has been received from partner agencies, and as of May 1 the trend analyses and figures for the report are approximately 50% complete. Staff have met regularly to coordinate production. A focus group, consisting of watershed residents who are active with the Center, was convened on April 27th to solicit input on the presentation of indicators in the new report.

**Annual Report:**

They provided feedback on their understanding of the information in the 2011 State of the Bays report, how they use the report, and made suggestions about how the data presentation could be improved to increase its value to the public. The 2016 report is on track to be published in September.

## Anchorage Canal Drainage Area Stormwater Retrofit Demonstration -- Sandpiper Pines Bioretention Areas and Infiltration Trenches

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Marianne Walch

Primary Project Partner Contacts:

George Junkin, Town Councilman, Town of South Bethany

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Stormwater Management	1	B	

#### Project Overview:

This project will provide full survey, design, permitting, and construction of 6 bioretention/infiltration trench areas and two infiltrations trenches within the Sand Piper Pines Subdivision of the Town of South Bethany to treat stormwater runoff from 10 acres of residential development. The objective for this project is to reduce the pollutant loads to the Anchorage Canal and Little Assawoman Bay by an estimated 14.97 pounds of nitrogen, 2.04 pounds of phosphorus, and 452.7 pounds of sediment per year in accordance with the Pollution Control Strategy action for stormwater retrofitting for the Inland Bays. A secondary objective of this project is the education of the community to the water quality issues within the South Bethany Canals and the Little Assawoman Bay. The project is funded primarily by a grant from the Delaware Water Infrastructure Advisory Council Community Water Quality Improvement Grant Program. The project is the fifth major implementation effort to implement this Stormwater Retrofit Demonstration Initiative which began with a planning study in 2008. The Initiative has demonstrated a variety of coastal stormwater retrofits with a focus on low cost solutions and native coastal vegetation. This particular project follows the retrofit conceptual design report for the Sandpiper Pines Area completed in 2014 using funding from the EPA. The project is anticipated to begin with the grant award in January of 2015. The Center coordinated the grant proposal for the project and will provide project oversight and outreach assistance. The Town of South Bethany will be the fiscal agent for the project and will competitively select a design build contractor.

#### Outputs/Deliverables:

1. Construction of 6 bioretention facilities and 2 infiltration trenches to treat stormwater runoff from 10 acres of residential development.
2. At least two education and outreach actions on the project including press releases to local media.

#### Intermediate Outcomes:

1. Reduction of an estimated 14.97 lbs of nitrogen to Anchorage Canal and Little Assawoman Bay annually.
2. Reduction of an estimated 2.04 lbs of phosphorus to Anchorage Canal and Little Assawoman Bay annually.
3. Reduction of an estimated 452.7 lbs of sediment to Anchorage Canal and Little Assawoman Bay annually.
4. Progress towards the Inland Bays Pollution Control Strategy Goal of treating 4,500 acres of lands developed prior to the State Stormwater Regulations.



Intermediate Outcomes:

5. Increased understanding of local population of stormwater impacts to water quality and their cleanup.

Long-Term Outcomes:

1. Improved water quality (reduced nutrient and algal concentrations and improved dissolved oxygen and water clarity) in the Anchorage Canal and Little Assawoman Bay.

Clean Water Act Programs:

Controlling Nonpoint Source Pollution on a Watershed Basis

Clean Water Act Program Implementation Role: Significant

Pollutant Information:

Pollutant	Year Reduced	Lbs Reduced
Nitrogen	2015	15
Phosphorus	2015	2
Sediment	2015	452

PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2015 EPA NEP Operating Grant	CE-993990-12-1	\$ 1,445.00	\$ 0.00	\$ 1,445.00
DNREC	Community Water Quality		\$ 136,900.00	\$ 0.00	\$ 136,900.00
Totals:			\$ 138,345.00	\$ 0.00	\$ 138,345.00

PROJECT PROGRESS

Beginning Date: 01/01/2015      Project Status: Ongoing "On Track"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Contractor Selection	Completed	12/01/2014	03/15/2015			
Survey, Geotech, and Concept Plans Completed	Completed	12/01/2014	07/15/2015			
Final Design Plans with Homeowner Input	Initiated	12/01/2014	09/30/2015			
Physical Construction Completed	Not Initiated	12/01/2014	04/30/2016			
Outreach Actions Complete	Initiated	12/01/2014	06/30/2016			

**Annual Report:**

Design plans for the project were approved through the Sussex Conservation District. A pre-construction meeting was held with the selected contractor, A-Del Construction, on March 11th, and construction began in mid-April. Construction and planting are scheduled to be completed near the end of May. The Center will assist the Town with an outreach presentation to residents in late June.

## Assessment and Progress Report on the 2008 Inland Bays Pollution Control Strategy

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Emily Seldomridge

Primary Project Partner Contacts:

Robert Palmer, Program Manager II, DNREC -- Divison of Watershed Stewardship, Strategy Manager

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Nutrient Management	1	A	
Administration	1	A	

#### Project Overview:

In 2008, the Delaware Dept. of Natural Resources and Environmental Control promulgated the Inland Bays Pollution Control Strategy (PCS). The result of a decade of agency deliberation and community input, the Strategy detailed 47 voluntary and regulatory actions necessary to achieve the Total Maximum Daily Loads of nitrogen and phosphorus to the Inland Bays and their tributaries. Full implementation of the strategy was estimated to cost over \$25 million annually. However, no dedicated funding was made available for implementation. Therefore, the largely-voluntary strategy has had at best mixed results that have only been partially reported on once in the 2011 State of the Bays Report.

In 2014, the DNREC and CIB reached agreement that, due to limited resources within DNREC, CIB would lead the coordination and reporting of PCS implementation. This project meets a critical need for public reporting and engagement on large-scale actions to restore the water quality of the Bays. This project will develop the first annual progress report of the PCS for public consumption to be completed by September 2016. The report will include an assessment of the major actions by pollutant source and make recommendations for a revision of the strategy due in 2018. The Center’s Watershed Coordinator will work with DNREC and parties responsible for implementing the Strategy to complete the assessment and recommendations. An annual reporting process and reporting commitments from responsible agencies will be developed. Design and release of the report will be coordinated with the release of the 2016 State of the Bays Report. The report will be made available to the public and promoted through media. The assessment working group and the Watershed Coordinator will determine the format and means of publication of the report during the project period. Partial report design will be accomplished by CIB staff and the working group may advise the use of a professional design contractor. EPA funds are budgeted for design and printing. The project has a goal of presenting the report to 750 individuals in person.

#### Outputs/Deliverables:

1. Progress report on implementation of the Inland Bays Pollution Control Strategy (PCS) including recommendations for Strategy revision.
2. Press event on the release of the report.

**Outputs/Deliverables:**

- 3. Presentation to 750 individuals on the report.
- 4. Annual reporting procedure and commitments from agencies responsible for implementing the Strategy.

**Long-Term Outcomes:**

- 1. Regular annual progress reports on the PCS.
- 2. Increased awareness by the general public and responsible agencies about progress towards implementing the PCS.
- 3. Accelerated implementation of the PCS and achievement of water quality standards due to improved agency coordination and awareness.

**Clean Water Act Programs:**

Identifying polluted waters and developing plans to restore them (total maximum daily loads)

Clean Water Act Program Implementation Role: Primary

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2016 EPA NEP Operating Grant		\$ 15,310.00	\$ 0.00	\$ 15,310.00
Totals:			\$ 15,310.00	\$ 0.00	\$ 15,310.00

**PROJECT PROGRESS**

Beginning Date: 10/01/2015      Project Status: Ongoing "On Track"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Convene PCS assessment and reporting working group	Completed	05/24/2015	11/01/2015	01/31/2016		
First draft of progress towards individual actions	Initiated	05/24/2015	05/01/2016	07/31/2016		
First draft of recommended revisions for strategy	Not Initiated	05/24/2015	08/01/2016			
Final report designed and printed.	Not Initiated	05/24/2015	09/01/2016			
Press event on report.	Not Initiated	05/24/2015	09/30/2016			

**Annual Report:**

In February 2016, the Watershed Coordinator convened working group meetings with DNREC (representatives from Surface Water Discharges, Groundwater Discharges, Watershed Stewardship, and Sediment and Stormwater programs), Department of Agriculture, Sussex County, and Sussex Conservation District. Agency commitments to provide data for assessment were made, and data collection initiated. In April 2016, a draft of components of progress towards individual actions was initiated. Data from a suite of

**Annual Report:**

agencies are needed to update the progress of PCS implementation, so data are reported out as received.

## Bio-enhancement to Improve Estuarine Habitat and Water Quality of Poorly-Flushed Residential Canals

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Marianne Walch

#### Primary Project Partner Contacts:

George Junkin, Town Councilman, Town of South Bethany, Municipal Coordinator

Mike Bott, Environmental Scientist, DNREC -- Division of Watershed Stewardship, Technical partner

#### Supporting Project Partner Contacts:

Stephanie Briggs, Project Scientist, Cardno Entrix, Contractor

Jonathan Cohen, Assistant Professor, University of Delaware -- College of Earth, Ocean, and Environment, Zooplankton analyses

Kathryn Coyne, Associate Professor, University of Delaware -- College of Earth, Ocean, and Environment, Phytoplankton analyses

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Nutrient Management	1	C	2
Water Quality Management	5	D	

#### Project Overview:

This project proposes to use oyster cages and floating treatment wetlands (FTW) installed along bulkheads in poorly-flushed residential canals to improve water quality and increase habitat for macro-invertebrate and fish communities. The project will provide research data to document the benefit of shellfish filtration in removing suspended solids, as well as the extent to which floating wetlands increase dissolved oxygen (DO) in limited circulation systems.

A total of 200 bushels of adult oysters were installed into York Canal in South Bethany in May 2015. Neighboring Carlisle Canal, with similar flushing and residence time, serves as an untreated control. Floating treatment wetland (FTW) islands were positioned adjacent to oyster cages to increase oxygen exchange, remove excess nutrients, and offer an additional means of providing complex habitat. As water passes through the network of hanging roots underneath the floating wetland islands, these roots pass oxygen into the water and provide a biological haven for the development of biofilms that aid in various nutrient removal and biological treatment processes. Turbidity and DO monitoring stations are positioned in both canals to document spatial and temporal changes in water quality in response to oyster filtration and wetland processes. The University of Delaware will provide support by collecting zooplankton and phytoplankton data from both treatment and control canals. The zooplankton plankton surveys will also allow quantification of oyster larvae. Semi-annual oyster morbidity and mortality monitoring also is included in the work plan.

This project is funded by a Community Water Quality Improvement Grant to the Center. The Town of South Bethany is providing long-

**Project Overview:**

term water quality monitoring data from the neighboring canals, volunteer labor, and funding for the wetland plantings. Cardno (contractor) is providing design and technical assistance services. DNREC's shellfish program has also provided technical assistance.

**Outputs/Deliverables:**

1. Install 200 bushels of adult oysters and 960 sq. ft. of FTWs into York Canal.
2. Document oyster survival rates, disease burden, spawning and recruitment through two seasons.
3. Document impact of oysters and FTW's on DO, turbidity, and plankton communities.
4. Press event near completion of project.
5. Public outreach materials and presentation.

**Long-Term Outcomes:**

1. Innovative, natural approaches developed for water quality improvements in poorly flushed residential canals.
2. Improved water quality in Inland Bays residential canals.
3. Restoration of natural shellfish communities in areas of the bays where they currently do not exist.

**Clean Water Act Programs:**

Controlling Nonpoint Source Pollution on a Watershed Basis

Clean Water Act Program Implementation Role: Primary

**Habitats:**

Habitat Type	Restoration Type	Units	Restoration
Other	Enhancement	Acres	0.10
Tidal Wetland	Establishment	Acres	0.02

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2014 EPA NEP Operating Grant	CE993990-12-0	\$ 16,672.00	\$ 0.00	\$ 16,672.00
EPA	FY2015 EPA NEP Operating Grant	CE-993990-12-1	\$ 16,672.00	\$ 0.00	\$ 16,672.00
DNREC	Community Water Quality Grant	CWQIG 13-02	\$ 143,000.00	\$ 44,436.00	\$ 187,436.00
Town of South Bethany	Leveraged Matching Cash		\$ 5,000.00	\$ 6,092.00	\$ 11,092.00
DNREC	FY2016 DNREC Operating Grant		\$ 3,718.00	\$ 0.00	\$ 3,718.00
EPA	FY2016 EPA NEP Operating Grant		\$ 8,274.00	\$ 0.00	\$ 8,274.00
EPA	FY2017 EPA NEP Operating Grant		\$ 11,791.79	\$ 0.00	\$ 11,791.79
Totals:			\$ 205,127.79	\$ 50,528.00	\$ 255,655.79

## PROJECT PROGRESS

Beginning Date: 12/20/2013

Project Status: Ongoing "On Track"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Draft plan developed	Completed	09/15/2015	06/01/2014			
Final plans development	Completed	09/15/2015	06/28/2014			
Monitoring equipment Installed	Completed	09/15/2015	06/28/2014	10/01/2014		
Floating wetlands planted and installed	Completed	09/15/2015	06/30/2015			
Oyster cages deployed in canal	Completed	09/15/2015	05/15/2015			
Monitoring of site performance and maintenance of equipment as needed	Initiated	09/15/2015	10/31/2016			
Final report completed	Not Initiated	09/15/2015	12/31/2016			

## Annual Report:

This project is on track, with no delays. The oyster cages and floating wetlands (FTWs) were deployed into York Canal in spring of 2015 and maintained approximately every three weeks throughout the summer and early fall. After a final cleaning in October, the cages were left in the water over the winter. Monitoring of oyster morbidity and mortality was conducted on a subsample of the oysters in October and in April. Survival overall has been better than expected. Water quality data continued to be collected. Cleaning and additional data collection resumed in March 2016. Collection of zooplankton community data by Dr. Jonathan Cohen of the University of Delaware began in April.

Problems with the continuous water quality sensors have posed the biggest challenge in this project. Telemetric transmission of the data from the three stations partially failed over the winter, but the data are still collected onto the internal SD cards, which we download periodically. Detailed analysis of data collected last year revealed that sensor fouling may have impacted data quality more rapidly than previously believed, so the sensors will be cleaned more frequently this season. The QAPP for the project is being updated to reflect changes in data analyses necessitated by the sensor problems that arose. The revised QAPP will be completed in May. Monitoring and maintenance has resumed for the upcoming Spring and Summer seasons, and will continue until the project's completion in October 2016.



## CIB General Brochure

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Sally Boswell

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Outreach and Education	3	D	

**Project Overview:**

We propose to design and produce a general information brochure about the Delaware Center for the Inland Bays highlighting areas of mission, challenges to be met, and the work of the CIB and its partners to meet those challenges. It will present opportunities for public participation and support. It will replace the brochure that was published in 2005.

Community outreach events, exhibits and speaking engagements continue to be important opportunities to reach residents and visitors to our watershed, and this is an important tool in that endeavor. It will be used as an introduction to our organization at community outreach events, trainings, speaking engagements and at major points of contact such as libraries, town halls and visitor centers. We propose a printed brochure, which will also be available as a pdf on our website. Completion date for this project: September 2016

**Outputs/Deliverables:**

1. Production of a brochure highlighting the mission and work of the Delaware Center for the Inland Bays for printed and digital distribution.
2. Distribution of the brochure through community outreach opportunities and through social media.

**Long-Term Outcomes:**

1. Increased public outreach and awareness about the mission and work of the Delaware Center for the Inland Bays, and awareness of the opportunities for citizen participation and support over the next five years.

### PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
DNREC	FY2015 DNREC Operating Grant	STATE-0000253060	\$ 1,500.00	\$ 0.00	\$ 1,500.00
EPA	FY2016 EPA NEP Operating Grant		\$ 2,311.00	\$ 0.00	\$ 2,311.00
Totals:			\$ 3,811.00	\$ 0.00	\$ 3,811.00

### PROJECT PROGRESS

Beginning Date: 06/15/2016                      Project Status: Ongoing "On Track"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Develop concept	Not Initiated	05/20/2015	06/30/2016			
Write copy and obtain photos	Not Initiated	05/20/2015	07/30/2016			
To graphic designer-mockup, copy and photos to graphic designer	Not Initiated	05/20/2015	08/15/2016			
Print brochure	Not Initiated	05/20/2015	08/30/2016			
Develop plan for distribution of printed copies	Not Initiated	05/20/2015	08/30/2016			
Plan for digital distribution	Not Initiated	05/20/2015	08/30/2016			
Distribute via email blast to 3000 watershed residents and property owners when published	Not Initiated	09/01/2015	09/30/2016			
Post on website	Not Initiated	09/15/2015				
Provide link on Facebook to brochure	Not Initiated	09/15/2015				
Crosspromote on other social media including Twitter and Instagram	Not Initiated	09/15/2015				

#### Annual Report:

Work on this project is scheduled to begin in early June 2016.

## Financing for Clean Water Outreach Campaign

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Sally Boswell

Primary Project Partner Contacts:

Brenna Goggin, Environmental Advocate, Delaware Nature Society

Supporting Project Partner Contacts:

Todd Lawson, County Administrator, Sussex County

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Outreach and Education	5	B	

#### Project Overview:

In 2014, the Governor of Delaware proposed the "Clean Water for Delaware's Future" plan: a comprehensive plan for protecting public health and cleaning up Delaware's bays, rivers and streams within a generation, while creating jobs and strengthening Delaware's economy. The plan was based upon a fee for property owners that would be leveraged to generate a total of \$120 annually for clean water projects involving wastewater, stormwater, agriculture, and toxic cleanup. The plan was well received in concept by the public but the particulars were little understood and many citizens were not aware that Delaware's waters needed to be cleaned up. As a result of what was learned through citizen focus groups conducted in all three counties, the CIB is partnering with other organizations involved in water quality education and restoration in Delaware to form the the Delaware Clean Water Alliance.

In 2015, the Alliance created and implemented outreach/marketing materials to encourage outdoor enthusiasts to support sustainable funding for clean water in Delaware. CIB, will attend a minimum of 7 meetings of the Alliance and serve on the Alliance's Steering Committee. CIB will 1) participate in the development of outreach materials, 2) participate in a social media education campaign, 3) educate at least 5 local businesses, retailers, and interested parties on how clean water affects Delaware's outdoor recreational opportunities, and 4) conduct at least 5 community workshops, tabling events, etc... targeting outdoor enthusiasts related to understanding local water quality issues and citizen action. The intended outcome is that the identified user group increases their understanding of the connection between water quality and financing to improve water quality and that members of these user groups take action to support improved financing for improved water quality. A grant award in the amount of \$15,000 will be passed through the Delaware Nature Society from the William Penn Foundation to the Center to implement the Center's commitment to the project. The Center is has contributed \$1,000 of unrestricted funds to support a telephone poll aimed at discovering public attitudes towards clean water in Delaware. No EPA funds will be spent on this project. The Inland Bays Pollution Control Strategy is designed to meet the Total Maximum Daily Loads of nutrients that will result in healthy water quality and has an estimated cost of \$25 million to implement annually. Implementation of the actions of this largely voluntary strategy since its promulgation in 2008 have had mixed results and

**Project Overview:**

overall slow progress due to a lack of dedicated funding. The Pollution Control Strategy is only one part of the Inland Bays CCMP. The need for increased financial support from the State of Delaware to achieve the goals of the PCS and the CCMP is of paramount importance for successful implementation.

**Outputs/Deliverables:**

1. Education of the public on water quality issues and the importance of clean water financing is achieved through social media posts, community tabling events, a grassroots training event, and a library display.
2. Growth of the Clean Water Alliance is achieved through educating and recruiting local businesses, retailers, and other interested parties on how clean water affects Delaware's public health, tourism, and environment.
3. Education of officials/legislators about the significance of clean water financing to the citizens of Delaware is achieved by collecting signatures at tabling events and meeting with legislators and attending the Clean Water Rally.

**Intermediate Outcomes:**

**Long-Term Outcomes:**

1. Persuade the public and officials/legislators to take action to support the financing of statewide clean water programs.
2. Have a network of businesses, retailers, and interested parties that will support these efforts together.

**Clean Water Act Programs:**

Controlling Nonpoint Source Pollution on a Watershed Basis

Supporting Sustainable Wastewater Infrastructure

Clean Water Act Program Implementation Role: Significant

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
Center for the Inland Bays	FY2015 Private Operating Revenue		\$ 1,000.00	\$ 0.00	\$ 1,000.00
Delaware Nature Society	Financing for Clean Water Outreach		\$ 15,000.00	\$ 0.00	\$ 15,000.00
Delaware Nature Society	Financing for Clean Water Outreach		\$ 7,514.66	\$ 0.00	\$ 7,514.66
Totals:			\$ 23,514.66	\$ 0.00	\$ 23,514.66

## PROJECT PROGRESS

Beginning Date: 11/24/2014

Project Status: Ongoing "On Track"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Development of outreach materials	Completed	09/15/2015	03/01/2016			
Completion of polling survey	Completed	09/15/2015	01/30/2015			
Education of 5 local entities	Completed	09/15/2015	01/30/2016			
Participation in community workshops	Completed	09/15/2015	01/30/2016			
Produce Exhibit for Community Outreach	Completed	05/20/2016	04/01/2016			
Produce/Distribute Social Media Content (12 posts minimum)	Completed	05/20/2016	09/30/2016			
Participate in at least 5 Workshops/Tabling events	Completed	05/20/2016	09/30/2016			
Businesses/Retailers: Educate 5 & Recruit 2 for Clean Water Alliance	Initiated	05/20/2016	09/30/2016			
Participate/Promote 1 Grassroots Training	Completed	05/20/2016	09/30/2016			
Educate 5 Officials/Legislators	Completed	05/20/2016	09/30/2016			
Attend Task Force Mtgs, Alliance Mtgs & Rally	Initiated	05/20/2016	09/30/2016			
Create & Display Materials in 3 Local Libraries	Initiated	05/20/2016	09/30/2016			
Produce/Distribute Social Media Content (12 posts minimum)	Not Initiated	05/20/2016	04/30/2017			
Participate in 3 Workshops/Tabling events	Not Initiated	05/20/2016	04/30/2017			
Businesses/Retailers: Educate 4 & Recruit 1 for Clean Water Alliance	Not Initiated	05/20/2016	04/30/2017			
Participate/Promote 1 Grassroots Training	Not Initiated	05/20/2016	04/30/2017			
Educate 4 Officials/Legislators	Not Initiated	05/20/2016	04/30/2017			
Attend Alliance Mtgs & Rally	Not Initiated	05/20/2016	04/30/2017			
Display Materials in 1 Local Library	Not Initiated	05/20/2016	04/30/2017			

## Annual Report:

As members of the Clean Water Alliance, at least one member of the Center for the Inland Bays staff was present at every Task Force and Alliance meetings throughout the state through FY2016 and served as liaison to other staff members, relaying information and

## Annual Report:

keeping up to date on Task Force progress and Alliance initiatives.

Through fiscal year 2016, we educated the public on water quality issues and the importance of clean water financing. Social media content was created and posted on the Center's social media outlets, far surpassing the goal of 12 posts. As of May 2016, Clean Water Financing posts included 14 on Facebook, 12 on Twitter and 3 on Instagram. This form of outreach is particularly aimed at sharing the importance of clean water with younger generations in an interactive format.

In March, two displays were designed and completed to better facilitate future outreach: one large 4-panel display for use at tabling events and one smaller display for use in local libraries and other public spaces. Center staff and volunteers took the 4-panel display to 5 workshops and tabling events, with 2 additional events scheduled for summer 2016.

At the 5 completed events, we reached 779 people, and collected 165 signatures supporting funding for clean water initiatives. These events include: Delaware Wetlands Conference (2/3/16 - 2/4/16), Lurefest (4/9/16), Millsboro Earth Day (4/22/16), Fenwick Island Earth Day (4/22/16), & CIB Native Plant Sale (4/30/16). Additional display opportunities will take place during summer 2016: Rehoboth Farmer's Market (scheduled for 6/28/16) and Maritime Heritage Festival (7/17/16), bringing us closer to the goal of 10 Workshops/Tabling events in FY16 and FY17 combined.

The additional library display was scheduled to rotate between area libraries: South Coastal Library (April 2016), Georgetown Library (May 2016) and in the Rehoboth Library (August 2016).

The Center also promoted and participated in a grassroots training event, the Water Warrior Training in Georgetown, Delaware on May 18th, 2016 with 12 participants. Project manager, Sally Boswell, presented information about the Your Creek initiative and prompted participants to consider their personal impact on clean water within their own neighborhoods.

The Center educated businesses and worked to grow the clean water alliance by visiting in-person, providing them with literature and inviting them to attend clean water events. In educating 5 businesses and retailers, we surpassed this goal, educating 6 businesses/retailers about the importance of clean water and clean water financing in Delaware. Each of the 6 businesses were invited to join the Clean Water Alliance. As of May 2016, none have committed. Staff will continue this goal through the end of FY16 and into FY17, aiming to recruit 3 businesses total.

Finally, we sought to educate 5 Officials/legislators on the importance of clean water financing to their citizens. We surpassed this goal with a total of 6 officials as of May 2016. Legislators approached so far include: Representative Stephen T. Smyk, Senator Ernesto B. Lopez, Senator Bryan Townsend, Representative Ronald E. Gray, Senator Bryant L. Richardson, and Representative Michael P. Mulrooney. Additional officials/legislators will be approached when we attend the Clean Water Rally on June 7th in Dover, Delaware.

Four members of CIB staff are registered to the event and this will be used as an opportunity to educate members of the public, collect signatures supporting clean water financing and educate Delaware's legislators about the importance of clean water and clean water financing.

## Gardening for the Bays Native Plant Sale

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Sally Boswell

Primary Project Partner Contacts:

Katelin Frase, Senior Educator, Environmental Concern, Inc

Pat Drizd, Volunteer, CIB Volunteer Project Coordinators

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Outreach and Education	3	D	

#### Project Overview:

In the last decade, tens of thousands of people have moved into the Inland Bays watershed and hundreds of new communities have been built around the Bays. These new residents, many of whom are retirees, are making landscaping decisions at their new homes and communities; decisions that will affect the future of our Inland Bays ecosystems for better or for worse.

The native plant sale was created to reach these new residents; to give them the opportunity to learn about and to purchase native plants for their property and to provide an event forum where they can get advice and information from our participating nonprofit partners on topics such as liveable lawns, backyard habitats and native pollinators. It also serves to bring gardeners and local nurseries together. The growing success of the event effectively demonstrates to the local participating nurseries that there is a growing interest in and market for Delaware native plants. Now a local institution, the Gardening for the Bays Native Plant Sale is an annual rite of spring at the James Farm Ecological Preserve. After twelve years, it remains the only native plant sale held in southern Delaware.

#### Outputs/Deliverables:

1. 400- 500 people attend the Native Plant Sale to purchase native plants and learn from experts.
2. Experts from at least six partner organizations participate in the NPS; provide demonstrations, walks, information and advice to attendees
2. Five nurseries sell over 1,000 native plants to attendees
3. Over 40 volunteers participate in planning and staffing the native plant sale
4. At least two local media outlets highlight native plant gardening in their coverage of the NPS

#### Long-Term Outcomes:

1. Increased demand for native plants from customers drives nurseries and garden centers to stock and sell more native plants.
2. Greater understanding of the role of native plants in the health of habitats in our watershed leads to greater support for conservation of open space, elimination of invasive species, and selection of native species for landscaping.

**Long-Term Outcomes:**

- 3. Increased understanding of the importance of native plants to support native fauna, especially pollinators.
- 4. Attendees to the sale who have not been involved with the CIB are introduced to our work and become involved as volunteers and contributors.

**Clean Water Act Programs:**

Controlling Nonpoint Source Pollution on a Watershed Basis

Clean Water Act Program Implementation Role: Primary

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
Center for the Inland Bays	FY2014 Private Center Operating		\$ 600.00	\$ 3,784.00	\$ 4,384.00
Center for the Inland Bays	FY2015 Private Operating Revenue		\$ 500.00	\$ 3,800.00	\$ 4,300.00
Center for the Inland Bays	FY2016 Private Operating Revenue		\$ 7,652.00	\$ 4,968.00	\$ 12,620.00
DNREC	FY2017 DNREC Operating Grant		\$ 5,118.85	\$ 0.00	\$ 5,118.85
Center for the Inland Bays	FY2017 Private Operating Revenue		\$ 1,000.00	\$ 0.00	\$ 1,000.00
<b>Totals:</b>			<b>\$ 14,870.85</b>	<b>\$ 12,552.00</b>	<b>\$ 27,422.85</b>

**PROJECT PROGRESS**

Beginning Date: 02/02/2005      Project Status: Ongoing "On Track"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Form 2015 volunteer committee	Completed	05/30/2014	01/16/2015			
Invite local nurseries to participate	Completed	05/30/2014	01/16/2015			
Invite master gardeners and other education partners to participate	Completed	05/30/2014	01/16/2015			
Complete logistics plan	Completed	05/30/2014	03/13/2015			
Complete media plan for sale	Completed	05/30/2014	04/10/2015			
Schedule volunteers	Completed	05/30/2014	04/10/2015			
Plan special programs and events for 2015	Completed	02/27/2015	03/30/2015			
Complete promotion and media for 2015 sales	Completed	02/18/2015	04/15/2015			



Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Finalize volunteer schedule for 2015	Completed	02/27/2015	04/24/2015			
Finalize logistics planning for 2015 sale	Completed	03/03/2015	04/15/2015			
Plan for sale items to generate income at 2015 sale	Completed	03/03/2015	03/31/2015			
Set date for 2016 sale	Completed	05/25/2015	10/30/2015			
Establish 2016 Planning Committee	Completed	05/25/2015	01/08/2016			
Convene Planning Committee	Completed	05/25/2015	02/05/2016			
Invite nurseries and nonprofits	Completed	05/25/2015	11/30/2015			
Finalize volunteer schedule for 2016	Completed	12/11/2015	04/25/2016			
Plan theme and special presentations for 2016	Completed	12/11/2015	03/30/2016			
Finalize logistics planning for 2016 sale	Completed	12/11/2015	04/25/2016			
Complete promotion and media for 2016 sales	Completed	12/11/2015	04/25/2016			
Convene 2016 planning committee for 'lessons learned'	Completed	05/17/2016	05/30/2016			
Invite nurseries and nonprofit partners for 2017 NPS	Not Initiated	05/17/2016	11/01/2016			
Establish theme and plan for special activities, presentations and demonstrations for the 2017 NPS	Initiated	05/17/2016	02/28/2017			
Convene 2017 Planning Committee	Not Initiated	05/17/2016	02/06/2017			
Complete logistics, volunteer and marketing plans	Not Initiated	05/17/2016	04/04/2017			
Set date for 2017 NPS	Not Initiated	05/17/2016	10/25/2016			

### Annual Report:

The 12th Annual Gardening for the Bays Native Plant Sale was held on April 30th. 445 cars were counted from 9 a.m.-1 p.m.; approximately 500 people attended. Lessons learned: 1.) It was brought to our attention that one of the four nurseries was selling cultivars of native plants that may not be considered native to our watershed. The committee addressed this concern at our wrap up meeting and will consult with the DE state botanist and the horticulturist at the Southern DE Botanical Garden to develop guidelines that will be provided to participating nurseries when they are invited to the 2017 NPS Sale. 2) It was brought to our attention by a committee member that the state is developing a list of 'target' native plants to support native pollinator species. It was decided that we will provide this list to participating nurseries so that they can include those species in their inventory for the 2017 sale.

Two exhibits that were featured at the 2016 sale 1) The 'Liveable Lawns' exhibit: "Lawn Fertilizing--It Isn't a Spring Thing!" to alert

### Annual Report:

homeowners to do their part in keeping nutrients out of our creeks and bays. 2) The Living Shorelines exhibit: "Keep our Shorelines Living!" to raise awareness about options for managing shoreline erosion and to educate attendees about the role of living shorelines in managing shorelines for climate resilience and protection of shallow water habitats. As a result of the NPS exhibit, we have been invited to present to the board of a waterfront community on Rehoboth Bay, Bayfront on Rehoboth, about options for a living shoreline project in their community.

Two nurseries that had participated in the sale for more than a decade did not attend this year. In each case, changes in operations at their nursery is the probable cause, though they both expressed regret at not being able to attend. We would welcome them back next year if they are able to come, but we were able to offer attendees to the sale a similar selection of plants as we added a new local nursery this year, and a returning nursery increased their inventory for our sale.

## Inland Bays CCMP Project Management and Oversight

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Chris Bason

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Administration	1	A	

#### Project Overview:

The Center for the Inland Bays, Inc. is an innovative management approach to watershed restoration and protection. 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.

Critical to the success of CCMP implementation activities is effective research and demonstration project oversight and reporting, grant development and management, contract administration, and coordination with organizations responsible for various work elements as well as tracking and communication of progress. Community and public relations, financial and property management, human resources management, and Management Conference support are also activities necessary to support the implementation of the CCMP. The Board of Directors, the office of the Executive Director and other appropriate staff, will be responsible for these on-going tasks listed below:

Task 1: Develop and secure public and private funding and in-kind resources as match to support the Section 320 NEP grant and CIB Work Plan.

Task 2: Prepare and distribute program updates and associated progress reports to the Board of Directors, State of Delaware, EPA, and general public.

Task 3: Recruit, hire, supervise, and evaluate appropriate support staff and volunteers as needed.

Task 4: Prepare, recommend, and monitor and manage program's resources through an annual budget; monitor budgetary and financial procedures to ensure financial policies are being followed; secure annual A-133 audit as needed; report finances to Environmental Protection Agency and Board of Directors.

Task 5: Provide administrative (meeting arrangements, notifications, minutes, etc) support for the Board of Directors and their standing and ad-hoc committees including the Scientific and Technical Advisory Committee, Citizen's Advisory Committee, Strategic Planning

**Project Overview:**

Committee, Water Use Plan Implementation Committee, and Living Shorelines Committee. Provide advice to the Board of Directors and serve as liaison between Board and staff.

Task 6: Provide communication media, including the Inland Bays Journal and Annual report, to public and private groups/individuals, state, county, and local governments.

Task 7: Facilitate implementation and monitor/track the progress of lead agencies responsible for implementation of CCMP tactics.

Task 8: Provide educational programs to schools, homeowners, and other publics to show better management practices within the Inland Bays watershed; methods will include special events, programs, lectures, slide shows, seminars, as well as media interaction (radio, TV, news articles, social media, etc).

Task 9: Provide effective management of CIB facilities and real properties including the CIB Headquarters and James Farm Ecological Preserve.

Task 10: Serve on state-wide and regional committees and task-forces to promote sound environmental policies based on best available science.

Task 11: Travel to national and regional EPA meetings and estuary-related conferences; provide technical assistance to other programs.

Task 12: Serve in an advisory capacity to elected officials, public policy makers and civic leaders on public policy related to the CCMP.

Task 13: Augment the CIB's membership program and sustain opportunities for volunteer participation.

**Outputs/Deliverables:**

CCMP Inclusive (see project Overview).

**Intermediate Outcomes:**

CCMP Inclusive

**Long-Term Outcomes:**

CCMP Inclusive

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2015 EPA NEP Operating Grant	CE-993990-12-1	\$ 166,780.00	\$ 201,283.00	\$ 368,063.00
EPA	FY2016 EPA NEP Operating Grant		\$ 278,965.00	\$ 0.00	\$ 278,965.00
EPA	FY2017 EPA NEP Operating Grant		\$ 390,953.84	\$ 0.00	\$ 390,953.84
Totals:			\$ 836,698.84	\$ 201,283.00	\$

**PROJECT PROGRESS**

Beginning Date: Project Status: Ongoing "On Track"

Annual Report:  
 Progress on this project is ongoing, see quarterly reports to the Board of Directors.

## Inland Bays Clean Up

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Bob Collins

#### Supporting Project Partner Contacts:

Doug Long, Park Superintendent, DNREC -- Division of Parks and Recreation, Sponsor

Bill Zolper, WUPIC rep, Dewey Beach Lions Club

Casey Zolper, Lieutenant, DNREC -- Division of Fish and Wildlife, WUPIC member

Bryan Kastor, General Manager, Waste Industries, Sponsor

Jodie H. Sleva, DSWA, sponsor

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Outreach and Education	4	B	

#### Project Overview:

The annual Inland Bays Clean-up is a partnership between the CIB's Water Use Plan Implementation Committee, the Division of Fish & Wildlife's Enforcement Section, Delaware State Parks, the Dewey Beach Lions Club, Waste Industries, Inc., Senator Ernesto Lopez and the Delaware Solid Waste Authority's Community Clean Up Initiative. Volunteers are encouraged to join in for a one-day clean-up of the Inland Bays. Fish & Wildlife Enforcement Agents, State Parks staff, CIB staff, and volunteer boat captains transport participants to selected areas around the Inland Bays for targeted clean up. Staging areas is the public boat ramp at Massey's Landing between Rehoboth and Indian River Bay; Mulberry Landing at Assawoman Wildlife Area in Little Assawoman Bay is used in various years, as well

The Water Use Plan Implementation Committee (WUPIC) plans and executes this event. WUPIC members help solicit volunteer boat captains and crew members, organize the event, and are active participants. Since 2004, the event has attracted more almost 800 volunteers, who collected a large quantity of debris, including soda bottles and cans, tires, hot water heaters, and a lot of plastic. Senator Lopez of the Delaware General Assembly also contributed grant assistance to fund the clean-ups. This is a long-term ongoing project that will continue every year.

#### Outputs/Deliverables:

1. Collect 6000 pounds of trash and debris annually.
2. Participation of at least 75 volunteers and 6 boats annually.

#### Long-Term Outcomes:

1. Increased awareness by the general public about the Inland Bays and commitment clean water.

Long-Term Outcomes:

- 2. Decreased pollution from litter and debris in the Inland Bays.
- 3. Opportunities to form new partnerships and attract new volunteers to the CIB.

Clean Water Act Programs:

Controlling Nonpoint Source Pollution on a Watershed Basis  
 Protecting wetlands

Clean Water Act Program Implementation Role: Primary

PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2014 EPA NEP Operating Grant	CE993990-12-0	\$ 5,230.00	\$ 0.00	\$ 5,230.00
EPA	FY2015 EPA NEP Operating Grant	CE-993990-12-1	\$ 5,086.40	\$ 0.00	\$ 5,086.40
Dewey Beach Lions Club	2014 Inland Bays Clean UP		\$ 1,000.00	\$ 0.00	\$ 1,000.00
State Farm Insurance	Inland Bays Clean UP		\$ 500.00	\$ 0.00	\$ 500.00
DNREC	FY2016 DNREC Operating Grant		\$ 1,316.00	\$ 0.00	\$ 1,316.00
EPA	FY2017 EPA NEP Operating Grant		\$ 3,004.64	\$ 0.00	\$ 3,004.64
Center for the Inland Bays	FY2017 Private Operating Revenue		\$ 1,000.00	\$ 0.00	\$ 1,000.00
Totals:			\$ 17,137.04	\$ 0.00	\$ 17,137.04

PROJECT PROGRESS

Beginning Date: 05/21/2005

Project Status: Ongoing "On Track"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
WUPIC coordinates clean up	Initiated	05/29/2014	07/12/2014			
Sign up volunteers	Initiated	05/29/2014	07/12/2014			
Conduct clean up	Completed	05/29/2014	07/12/2014			
WUPIC coordinates clean up	Completed	05/29/2014	06/30/2015			
Sign up volunteers	Completed	05/29/2014	06/30/2015			
Conduct Clean-Up	Completed	05/26/2015	06/13/2015			
Planning meetings by WUPIC for 2016 Clean-up	Completed	09/03/2015	06/01/2016			

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Conduct Clean-Up	Initiated	09/03/2015	06/11/2016			
Conduct Clean-Up	Not Initiated	05/17/2016	06/10/2017			

**Annual Report:**

WUPIC met on February 15th and set June 11, 2016 for the next Inland Bays Clean-Up. Planning for it is in progress.



## James Farm Master Plan Implementation Phase I

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Chris Bason

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Outreach and Education	2	A	1

#### Project Overview:

The James Farm is a 150-acre ecological preserve on Indian River Bay that the Center manages for recreational and educational purposes related to the Inland Bays and their watershed. The James Farm Master Plan was completed in October of 2014 (see James Farm Master Plan annual report in FY2016 workplan submittal for a description). The Plan to improve the Farm to protect natural resources and enhance educational opportunities while accomodating increased visitation will be developed in phases. This project will implement the first phase of the plan which will be completed with schematics and costs. It is anticipated this phase will include a series of improvements including trail and parking area relocation. Interpretive signage is anticipated to be developed in a later phase. The implementation of this first phase will include a funding development component to be accomplished primarily with non-federal funds. Potential supporting grant programs include the Delaware Community Foundation Capital Grant, the Delaware Land and Water Conservation Trust Fund, Sussex County, and the Longwood Foundation. This workplan item will be updated after plan completion to reflect specifics. EPA funding will support the salary and benefits of a project manager and the Executive Director for grant development.

In FY2016, funding for partial construction and engineering design and permitting was secured. It is anticipated that this design will be completed by the start of FY2017. During FY2017, this project will continue to develop implementation funding for the first phase of the initiative that focuses on the gateway of the property. Partial construction of phase I with money in hand is anticipated for FY2017.

#### Outputs/Deliverables:

1. Successful grant awards and donations for project implementation.
2. Completed work project to implement Phase I of Master Plan.

#### Intermediate Outcomes:

1. Improved management and design of the Farm to handle increased visitation while protecting natural resources.
2. Increased awareness and understanding about the native habitats of the watershed and sea level rise by visitors to the Farm.

#### Long-Term Outcomes:

1. Increase in willingness to support water quality restoration actions for the Inland Bays.
2. Maintenance of the ecosystem services provided by the farm including wildlife habitat and the provision of clean water.

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2015 EPA NEP Operating Grant	CE-993990-12-1	\$ 4,402.00	\$ 0.00	\$ 4,402.00
DNREC	FY2015 DNREC Operating Grant	STATE-0000253060	\$ 10,325.00	\$ 0.00	\$ 10,325.00
Sussex County	FY2015 Sussex County Operating		\$ 11,600.00	\$ 0.00	\$ 11,600.00
DNREC	FY2016 DNREC Operating Grant		\$ 4,769.00	\$ 0.00	\$ 4,769.00
EPA	FY2017 EPA NEP Operating Grant		\$ 9,219.91	\$ 0.00	\$ 9,219.91
DNREC	Land and Water Conservation Trust	Phase I Design	\$ 35,000.00	\$ 0.00	\$ 35,000.00
Sussex County	James Farm Planning Grant Match		\$ 30,000.00	\$ 0.00	\$ 30,000.00
Totals:			\$ 105,315.91	\$ 0.00	\$ 105,315.91

**PROJECT PROGRESS**

Beginning Date: 10/01/2014

Project Status: Ongoing "On Track"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Submit Grant Proposals	Initiated	05/06/2014	12/01/2014	11/01/2015	09/01/2016	
Develop Construction Design RFP	Completed	05/06/2014	02/29/2016			
Complete Phase I Implementation	Not Initiated	05/30/2014	12/21/2017			
Develop fundraising plan	Completed	11/30/2014	03/01/2015	11/30/2015	02/29/2016	

**Annual Report:**

The award from the Land and Water Conservation Trust Fund for \$35,000 for permitting and construction and engineering design was officially approved in December. This was then matched by a \$30,000 cash from Sussex County. Sussex County was required to be the fiscal agent per the terms of the Land and Water Conservation Trust Fund grant. An initial request for proposals was required to be submitted to a number of engineering firms on contract with the County. The first ranking bidder's price was extraordinarily high (far exceeding available funding) and a different approach to obtaining more affordable services was arranged for. A revised RFP was developed for full public bidding in the hopes of securing lower costs from local firms interested in supporting the farm that have less overhead. A near final draft of the Case Statement for development purposes is completed and is awaiting a revised estimate of costs that will result from the construction design. The County has budgetted to continue to provide match and fundraising support for development efforts. Design and permitting for partial phase 1 is anticipated to be completed by the end of FY2016.

## Management of the James Farm Ecological Preserve

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Bob Collins

Supporting Project Partner Contacts:

Todd Lawson, County Administrator, Sussex County, Property Owner/Grant Funder

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Administration	3	A	

#### Project Overview:

The James Farm Ecological Preserve is a 150-acre property on the Indian River Bay, owned by Sussex County and managed by CIB for recreational and educational purposes related to the Inland Bays and their watersheds. The Preserve holds a variety of ecosystems that are characteristic of the region including forest, wetlands and meadows. Over 10,000 visits are made to the Preserve every year for educational and recreational activities. These include the CIB's Middle School Education Program, CIB's annual Native Plant Sale, eco-tours and passive recreation. The Preserve is an important component of the CIB's efforts to educate the public about the Inland Bays and their restoration.

Over two miles of trails, five boardwalks, five wildlife viewing stations, parking facilities, a sandy beach and educational support structures are maintained. Visitation to the Preserve continues to increase, providing both ongoing challenges for its management and opportunities for educating a growing population. Ongoing activities include ecosystem management, invasive plant species control, trail and structure maintenance, education, community relations, and administration. A Master Plan for the Preserve, designed to accommodate increasing visitation, enhance educational opportunities, and protect the existing ecosystems was developed in 2014 and will be implemented over five years. The Preserve is maintained by the CIB Program Manager supported by a group of community volunteers. Funding has traditionally been provided by the EPA, DNREC, Sussex County and private donations.

#### Outputs/Deliverables:

1. Provide facilities for over 10,000 unsupervised visits by the visiting public for purposes of recreation and environmental education.
2. Maintain the quality and function of 150 acres of natural ecosystems in the preserve per the objectives in the James Farm Master Plan.
3. Maintain an active core of James Farm volunteers.
4. Provide informal environmental educational opportunities through the maintenance of educational signage and a kiosk, guided educational tours, and online educational programming.
5. Maintain conditions to support the Center's James Farm Middle School Education Program (see separate workplan item).
6. Provide habitat enhancement by controlling invasive plant species.
7. Coordinate facility improvements through the James Farm Master Plan process (see separate workplan item).

Long-Term Outcomes:

1. Improved public knowledge about the watershed's ecosystems and estuarine organisms.
2. Increased likelihood of the public to support protection and restoration of the Inland Bays and their Watershed.
3. Increased likelihood of the public to financially support the CIB and its programs and preserves.
4. Enhanced habitat for Species of Greatest Conservation Need as identified by the Delaware Wildlife Action Plan.
5. Swimmable-fishable waters

Clean Water Act Programs:

Strengthening National Pollutant Discharge Elimination System Permits

Protecting wetlands

Clean Water Act Program Implementation Role: Primary

Habitats:

Habitat Type	Restoration Type	Units	Restoration
Field/Meadow	Maintenance	Acres	8.00
Forest/Woodland	Maintenance	Acres	58.00
Other	Maintenance	Acres	2.00
Tidal Wetland	Maintenance	Acres	80.00

PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
DNREC	FY2016 DNREC Operating Grant		\$ 19,660.00	\$ 0.00	\$ 19,660.00
EPA	FY2016 EPA NEP Operating Grant		\$ 16,206.00	\$ 0.00	\$ 16,206.00
Center for the Inland Bays	FY2016 Private Operating Revenue		\$ 500.00	\$ 0.00	\$ 500.00
Sussex County	FY2016 Sussex County Operating		\$ 16,100.00	\$ 0.00	\$ 16,100.00
USFWS	"State Wildlife Grant- Conservation		\$ 4,097.00	\$ 2,138.60	\$ 6,235.60
DNREC	FY2017 DNREC Operating Grant		\$ 1,077.69	\$ 0.00	\$ 1,077.69
Sussex County	FY2017 Sussex County Operating		\$ 20,000.00	\$ 0.00	\$ 20,000.00
Totals:			\$ 77,640.69	\$ 2,138.60	\$ 79,779.29

PROJECT PROGRESS

Beginning Date: 10/01/2015

Project Status: Ongoing "On Track"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Complete invasive species management grant requirements.	Completed	04/13/2015	12/30/2016			
Promotion of bird monitoring at the James Farm via Ebird through 3 outlets.	Initiated	04/21/2015	09/30/2016			

#### Annual Report:

The James Farm Ecological Preserve continues to be a popular destination in coastal Sussex. An estimated 10,000-plus visitors enjoyed paddle-sports, shell-fishing, bird-watching or light hiking, attending the Native Plant Sale or participating in the educational program. Visitation is likely growing.

In the calendar year 2015, 332.75 volunteer hours were expended on general maintenance activities.

Last year, an Invasive Plant Species control project treated 29 acres to control *Lonicera japonica*, *Ligustrum vulgare*, *Rosa multiflora*, *Elaeagnus umbellata* and *Pyrus calleryana*. This project was funded, in part, through a grant from the Delaware Division of Fish and Wildlife with funding from the Division of Federal Aid, United States Fish and Wildlife Service under the State Wildlife Grant Program.

An October 2015 Facebook post promoted the James Farm as an eBird hotspot. 165 species sightings have been reported on eBird.

## Migratory Fish Passage Designs for Dams on the Tributaries of the Inland Bays

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Marianne Walch

Primary Project Partner Contacts:

Larry Trout, RK&K, Contractor

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Managing Living Resources and Their Habitat	3	B	

#### Project Overview:

American shad, hickory shad, alewife, blueback herring, and American eel are all important species for commercial fisheries. Much of these species' historic spawning and nursery habitats have been lost due to impediments, such as dams and other man-made blockages, on their spawning and recruiting systems, and have directly contributed to the decline of the fisheries stocks of each of these species. The Delaware Inland Bays system is a productive estuary that has historically supported spawning and recruiting habitat for these species.

In 2014, the Inland Bays migratory fish passage study determined through a priority ranking model that Millsboro Pond on the Indian River and the Burton Pond Dam on Herring Creek were the highest priorities of the eight dams in the watershed for fish passage device installation. The Delaware Division of Fish and Wildlife is reluctant to approve installing a fish ladder at Millsboro Pond dam because of concerns over potential passage of nontarget species such as gizzard shad. DFW does not have these same concerns regarding installing fish passage at Burton Pond dam, so Burton Pond dam was selected for retrofitting of a device suitable for enhancing anadromous fish passage.

A total of 6.89 stream miles in the Rehoboth Bay watershed would be opened as habitat for the targeted species as a result of the passage. Per the recommendations of the study, concept design will be completed for a prefabricated Alaskan Steep pass fish ladder. Initial permission for installing the passage has already been granted by the owner of the dam. Engineering design and permitting will also be completed for three eelways on three separate dams on the Inland Bays per the study. These will be relatively inexpensive and easy to install, and they will provide at least for passage of larval eels at locations where full fish ladders are not feasible. The work will be conducted RK&K engineering under a Master of Services Agreement. The work will be used to pursue private and public grant funding for implementation of the passages.

#### Outputs/Deliverables:

1. Conceptual design report for Burton Pond Fish Ladder on Herring Creek.
2. Engineering design report for three eelways over priority ranked dams on tributaries of the Inland Bays.
3. Installation of fish ladder on Herring Creek and three eelways over priority ranked dams on tributaries of the Inland Bays.

Long-Term Outcomes:

1. Increased local populations of shad, herring, alewife, and American eel as measured by ongoing trawl surveys and, potentially, site specific monitoring.
2. Increased potential for reproduction of freshwater mussel species associated with target fish species.
4. Increased acceptance of the public and funders to continued fish passage restoration.

Clean Water Act Programs:

Protecting wetlands

Protecting Large Aquatic Ecosystems

Clean Water Act Program Implementation Role: Primary

PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2015 EPA NEP Operating Grant	CE-993990-12-1	\$ 18,899.00	\$ 0.00	\$ 18,899.00
DNREC	FY2015 DNREC Operating Grant	STATE-0000253060	\$ 12,945.00	\$ 0.00	\$ 12,945.00
DNREC	FY2012 DNREC Operating Grant		\$ 5,153.00	\$ 0.00	\$ 5,153.00
DNREC	FY2016 DNREC Operating Grant		\$ 1,487.00	\$ 0.00	\$ 1,487.00
EPA	FY2016 EPA NEP Operating Grant		\$ 3,310.00	\$ 0.00	\$ 3,310.00
Totals:			\$ 41,794.00	\$ 0.00	\$ 41,794.00

PROJECT PROGRESS

Beginning Date: 06/01/2014 Project Status: Ongoing "Minor Delays"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Complete contractor task order including project milestones.	Completed	05/25/2015	06/15/2015			
Pursue grant funding for fish ladder implementation.	Initiated	09/03/2015	03/31/2016			
Complete fish ladder design.	Completed	09/03/2015	08/31/2016			
Construction of eel ladders complete.	Not Initiated	09/03/2015	04/01/2017			

Annual Report:

Due to factors outlined in previous progress reports, the focus site for fish passage in the Inland Bays was shifted from the Millsboro Pond dam to the dam at Burton Pond on Herring Creek. \$10,000 of extended FY 2015 funding originally allocated to the Millsboro Dam fish ladder was reallocated to another project that was in need of funds (the Inland Bays Monitoring Plan).

### Annual Report:

In March, RK&K completed a conceptual design for fish passage over the Burton Pond dam. They are continuing to work on design and permitting for three eelways identified in our previous fish passage study. External funding for the fish ladder project implementation is being pursued, but we have not yet been successful in securing this. Burton Pond is privately owned, and a couple of months ago the pond and surrounding farm property was put up for sale. It is unclear at the moment how this will affect the feasibility and timeline of fish ladder implementation.



## Your Creek

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Sally Boswell

Primary Project Partner Contacts:

Andrew Homsey, Gis Services Manager, University of Delaware -- Institute for Public Administration, Water Resources Agency

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Outreach and Education	5	A	

#### Project Overview:

Coastal estuaries are rapidly urbanizing as baby boomers build retirement homes in communities close to the water. The Inland Bays in south coastal Delaware is within a 3-hour drive of Washington, D.C., Baltimore and Philadelphia, and what was once a mecca for summertime visitors is now the permanent home of tens of thousands. The Your Creek initiative was launched to introduce our many new residents to their local creek; to empower communities and their residents with information to successfully advocate to protect water quality where they live by providing a forum for them to get to know their creek, each other, and our organization as a source of information and support.

It is a multi-year project that will focus on the fourteen major tributaries of the three Inland Bays. A Creek Team is formed for each new creek and residents and homeowners, especially those who live in the Creek watershed, are recruited onto the Teams. An online survey of residents is conducted by each Creek Team as new Creek Teams are formed. The surveys gather information on the concerns, opinions, and understanding of local creeks by residents and property owners and the survey data is used in selecting specific indicators for each Creek and in development of outreach materials. The surveys and salary to manage is funded through our State of Delaware Operating Grant.

Data on a suite of environmental indicators is compiled for each creek based on data available and citizen interests and concerns. A technical report that describes methods used to develop the indicators and their trends, and the data produced, will be developed for each creek, and indicators will be incorporated into outreach materials, including a 'State of the Creek' report. Of priority interest in characterizing each creek will be: the status and trends of the nutrient concentrations, sources of nutrient input, land use, status of habitat, and potential threats or concerns specific to each watershed. Outreach products including a powerpoint presentation and brochure are developed for each creek and with support of the Creek Team taken into each Your Creek community to educate, inform and involve residents.

The Love Creek Team completed its work this year and members are now working as the 'Friends of Love Creek.' The Dirickson Creek Team is actively working and will likely complete their Creek Team work and become the 'Friends of Dirickson Creek.' We begin work on the Pepper/Vines Creek Team in 2017.

### Outputs/Deliverables:

1. Dirickson Creek Team completes it work and becomes the 'friends of Dirickson Creek.'
2. A Creek Team for Pepper/Vines Creek is formed and Team Leader is identified.
3. A watershed survey to residents in the Pepper/Vines Creek community to solicit information on concerns, opinions, and understanding is designed and distributed.
3. At least one familiarization kayak trip and one field trip to a restoration or project sites in each creek watershed is held for Vines/Pepper Creek team.
4. State of Vines/Pepper Creek Report is published.
5. Outreach campaign is executed to include website page, press release on the launch of the team, social media postings, and development of powerpoint and brochure based on the State of the Creek reports
6. Training workshop provided to team members for effective advocacy.
7. Project report on the Love Creek Team is completed

### Long-Term Outcomes:

1. As Creek residents are empowered with knowledge and information to act on behalf of their creek and its watershed there is an increase in public participation on the local and state level in policies and issues that affect the creeks and bays.
2. Increased adoption of pollution control practices by residents and their communities.
3. As Creek Teams coalesce in sharing information and reaching out into their communities, some Creek Teams will become "Friends of" groups.
4. Increased membership and support for CIB.

### Clean Water Act Programs:

Controlling Nonpoint Source Pollution on a Watershed Basis

Developing Total Maximum Daily Loads

Improving Water Quality Monitoring

Clean Water Act Program Implementation Role: Primary

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
DNREC	FY2014 DNREC Operating Grant	STATE-0000207936	\$ 93.00	\$ 0.00	\$ 93.00
EPA	FY2014 EPA NEP Operating Grant	CE993990-12-0	\$ 4,324.00	\$ 3,168.00	\$ 7,492.00
EPA	FY2015 EPA NEP Operating Grant	CE-993990-12-1	\$ 9,927.00	\$ 8,184.00	\$ 18,111.00
EPA	FY2015 EPA NEP Operating Grant	CE-993990-12-1	\$ 5,519.00	\$ 0.00	\$ 5,519.00
DNREC	FY2015 DNREC Operating Grant	STATE-0000253060	\$ 185.00	\$ 0.00	\$ 185.00
EPA	FY2016 EPA NEP Operating Grant		\$ 7,300.00	\$ 0.00	\$ 7,300.00
EPA	FY2017 EPA NEP Operating Grant		\$ 15,166.26	\$ 0.00	\$ 15,166.26
DNREC	FY2017 DNREC Operating Grant		\$ 6,142.94	\$ 0.00	\$ 6,142.94
Totals:			\$ 48,657.20	\$ 11,352.00	\$ 60,009.20

**PROJECT PROGRESS**

Beginning Date: Project Status: Ongoing "Minor Delays"

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Meet with DelDot to explore possible of road signage for creeks	Completed	11/21/2013	12/16/2013			
Form Love Creek Team and identify leadership	Completed	11/21/2013	02/26/2014			
Begin technical review of indicator data	Completed	11/21/2013	02/26/2014			
Develop Love Creek Survey to gauge citizen interests and concerns	Completed	02/26/2014	03/26/2014			
Begin development of indicators and mapping for Love Creek	Completed	02/26/2014	04/24/2014			
Host familiarization kayak trip for the Love Creek Team	Completed	03/26/2014	05/19/2014			
Create webpage for Your Creek	Completed	11/21/2013	06/20/2014			
Distribute Love Creek Survey and evaluate results	Completed	05/30/2014	07/31/2014			
Selection of common indicators and creek-specific indicators for Love Creek	Completed	05/30/2014	07/18/2014			
Publish outreach/education brochure/flyer for Love Creek	Completed	05/30/2014	10/29/2014	08/31/2015		
Develop Your Creek exhibit	Cancelled	05/30/2014	10/29/2014	09/30/2015		

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Develop powerpoint for Your Creek project	Completed	05/30/2014	01/30/2015			
Produce and install signs on Love Creek	Extended	05/30/2014	08/31/2015	09/30/2016		
Form Dirickson Creek Team	Completed	12/01/2014	02/20/2015			
Dirickson Creek Publish outreach/education brochure	Extended	12/04/2014	03/31/2015	07/30/2016		
Create powerpoint for Love Creek	Completed	12/04/2014	01/31/2015			
Dirickson Creek-Create powerpt	Completed	12/04/2014	03/31/2015			
Complete design and distribution on online survey for Dirickson Creek	Completed	05/25/2015	09/30/2015			
Create Dirickson Creek webpage	Completed	05/25/2015	06/30/2015			
Create Love Creek blog	Completed	03/02/2015	05/15/2015			
Complete State of Love Creek Report	Completed	11/28/2014	06/01/2015			
Complete environmental indicators for Dirickson Creek	Completed	05/25/2015	09/30/2015			
State of Dirickson Creek report finalized	Extended	05/25/2015	10/30/2015	07/15/2016		
Organize a paddle trip on Dirickson Creek to familiarize Creek Team members with their Creek.	Completed	04/01/2015	07/30/2015			
Dirickson Creek Team begins community outreach-target of five presentations to HOA's/organizations	Completed	05/26/2015	10/30/2015			
Draft State of Dirickson Creek report developed	Completed	05/28/2015	09/01/2015			
Technical review of State of Dirickson Creek draft report	Extended	05/28/2015	09/30/2015	06/30/2016		
Love Creek Team presents to five HOA's/organizations in the creek watershed	Completed	04/01/2015	12/31/2015			
Transition Dirickson Team to a 'Friends of' group	Not Initiated	05/18/2016	01/30/2017			
Identify leadership and founding members for Pepper/Vines Creek Team	Not Initiated	05/18/2016	04/15/2017			
Convene Pepper/Vines Creek Team	Not Initiated	05/18/2016	03/30/2017			
Develop and complete Pepper/Vines Creek Survey	Not Initiated	05/18/2016	08/30/2017			
Gather data on Environmental Indicators for Vines/Pepper Creek	Not Initiated	05/20/2016	03/30/2017			

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Publish State of the Creek Report for Vines/Pepper Creek	Not Initiated	05/20/2016	06/15/2017			
Produce outreach materials for Vines/Pepper Creek	Not Initiated	05/20/2016	07/22/2017			
Complete project report on Love Creek Team	Not Initiated	05/25/2016	01/31/2017			
Hold training workshop on effective advocacy for team members	Not Initiated	05/25/2016	08/31/2017			

### Annual Report:

We completed the work of the Love Creek Team; published the State of Love Creek report and the State of Love Creek brochure and began distribution to the community and at events. A presentation about Love Creek was produced and is being presented to groups in the Love Creek watershed. The presentation highlights the findings of the report and is a call to action for creek residents suggesting actions that can be taken by homeowners and communities. This spring, the Love Creek Team was dissolved and is now the 'Friends of Love Creek' which gives them independence to pursue advocacy activities and community action to protect water quality in the creek and protection of habitat in the creek watershed. A Facebook page was created to provide a forum for Love Creek residents to share information and recruit others to become friends of the creek. The 'friends of Love Creek' and the Dirickson Creek Team are engaged in citizen science projects on their creek including oyster gardening sites on the canals, and water quality testing for the Citizen Monitoring Program.

The Dirickson Creek Team has strong leadership and a core membership of about a dozen very active members and an additional thirty participants. Members of the group are actively working in several creek waterfront communities to address stormwater pollution of the creek, and homeowner and community turf management to reduce nutrient runoff into the creek. An existing garden club at one of the largest communities on the creek expanded its mission to become a garden/ environmental club as a forum for informing and educating residents about creek issues; it now welcomes participation from all residents in the Dirickson Creek watershed. As the Team has identified projects and concerns in their communities, we have introduced them to partners such as the Sussex Conservation District to assist them in their work. We invited team members to workshops held this year on green infrastructure, living shorelines/climate resiliency, and clean water advocacy to build knowledge capacity on the Team. Several members attended each of the workshops. The DC Team presented the "Livable Lawns" exhibit this spring at our Native Plant Sale and provided information on managing nutrients at home. A familiarization paddle trip on Dirickson Creek was held last summer and attended by 16 team members. The work to gather data on the environmental indicators for Dirickson Creek is completed and the State of the Creek Report is in production.

Lessons learned: 1. The task of gathering data on environmental indicators for each creek and compiling that information into a State of the Creek report has proven a time challenge to staff. We are exploring other consultant options for production of the reports. 2. Creating an effective Creek Team is a cultivation process that takes time; it requires identification and cultivation of a committed Team leader and prompt engagement and support of Team members in issues and projects of interest and concern to them. Each Creek and each Team is very different and success requires understanding the unique characteristics and challenges in each creek watershed. Getting Teams out on the creek and engaged in citizen science projects and outreach opportunities that speak to their hopes and concerns for their Creek is essential.

## PROPOSED PROJECTS

# Anchorage Canal Drainage Area Retrofit Project Wetland Wetpond

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## MANAGEMENT AND PARTNERS

CIB Project Manager: Marianne Walch

### Primary Project Partner Contacts:

George Junkin, Town Councilman, Town of South Bethany, Community Representative

Brett Warner, Public Works Director, Town of Bethany Beach, Community Representative

David Wiecking, Town Representative, Middlesex Beach Association, Community Representative

Larry Trout, RK&K, Contractor

John Gilbert, Board Member, Sea Colony Resort, Property owner and funding match

### Supporting Project Partner Contacts:

Todd Pryor, DELDOT, Project Manager

## DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Stormwater Management	1	B	
Water Quality Management	5	B	

### Project Overview:

In this project, a stormwater treatment facility will be designed and constructed in an area of state-owned right-of-way between Route 1 and the Sea Colony high-rise complex, located between the towns of Bethany Beach and South Bethany in unincorporated Sussex County. The facility will include wet pond and wetland components designed to remove excess nutrients, oils, and bacteria from stormwater runoff contributed by a roughly 40-acre urban drainage area. Construction of the facility will require closure of the S. Pennsylvania Ave. north-bound slip ramp off Route 1 and the creation of a new right-hand turn lane at the existing intersection of Route 1 and S. Pennsylvania Ave. The footprint of the facility will include the old S. Pennsylvania Ave. slip ramp and a triangular piece of unutilized ground that lies between Route 1 and the Sea Colony complex. The facility will include a path for pedestrian and bicycle traffic and will beautify the area by providing landscaping with native plants and an attractive water feature to match with ongoing beautification work in the nearby communities. A traffic study will be included in the project to determine traffic patterns and the dimensions of the new right hand turn lane.

The objective for this project is to reduce the pollutant loads to the Anchorage Canal and Little Assawoman Bay by an estimated 21.6 pounds of nitrogen and 5.05 pounds of phosphorus per year in accordance with the Pollution Control Strategy action for stormwater retrofitting for the Inland Bays. A secondary objective of this project is the education of the community to the water quality issues within the South Bethany Canals and the Little Assawoman Bay. The project is funded primarily by the Federal Highways Transportation Alternatives Program, with 20% match from Sea Colony, and \$10,000 cash match from the CIB. The Delaware Dept. of Transportation (DelDOT) is the fiscal agent for the project and will manage the design and construction. The Center coordinated the grant proposal for

### Project Overview:

the project and will provide project assistance with partner coordination and outreach.

The project is the sixth, and last, major implementation effort to implement this Stormwater Retrofit Demonstration Initiative which began with a planning study in 2008. The Initiative has demonstrated a variety of coastal stormwater retrofits with a focus on low cost solutions and native coastal vegetation.

### Outputs/Deliverables:

1. Stormwater treatment BMP constructed to 5 acres of drainage area.
2. Nutrient load reductions of 21.6 lbs TN and 5 lbs TP per year entering Anchorage Canal
3. Press event

### Long-Term Outcomes:

1. Improved water quality in Anchorage Canal and Little Assawoman Bay
2. Improved pedestrian and bicycling safety

### Clean Water Act Programs:

Controlling Nonpoint Source Pollution on a Watershed Basis

Addressing diffuse, nonpoint sources of pollution

Protecting coastal waters through the National Estuary Program

Clean Water Act Program Implementation Role: Significant

### Pollutant Information:

Pollutant	Year Reduced	Lbs Reduced
Nitrogen	2019	21
Phosphorus	2019	5

### PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
DNREC	FY2017 DNREC Operating Grant		\$ 3,595.98	\$ 0.00	\$ 3,595.98
DeIDOT	Transportation Alternatives Program		\$ 600,000.00	\$ 0.00	\$ 600,000.00
Sea Colony Resort	Stormwater pond matching funds		\$ 150,000.00	\$ 0.00	\$ 150,000.00
Totals:			\$ 753,595.98	\$ 0.00	\$ 753,595.98

### PROJECT PROGRESS

Beginning Date: 10/01/2016

Project Status: Proposed



Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Full design and permitting completed	Not Initiated	05/17/2016	06/30/2017			
Construction completed	Not Initiated	05/17/2016	01/31/2019			
Traffic study and concept design completed	Initiated	05/17/2016	09/30/2016			

#### Annual Report:

DeIDOT approved funding for the design and construction of this BMP through the Federal Highways Transportation Alternatives Program (TAP). RK&K was contracted by DeIDOT to do the design work. CIB staff met onsite with RK&K and DeIDOT in early March to discuss changes made to the project footprint due to utility constraints (an existing water line, a sanitary sewer line, and above ground utility poles). A kickoff meeting of project partners and stakeholders – which included the CIB, RK&K, Sea Colony, and representatives of other communities in the Anchorage Canal watershed – was held on March 23rd. The design concept, site constraints and timeline for the project were discussed. RK&K will begin work on a traffic study and the design as soon as a Notice to Proceed is received from DeIDOT. This is expected in July 2016.

# Broad, Risked-Based Climate Change Vulnerability Assessment of the Inland Bays CCMP

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## MANAGEMENT AND PARTNERS

CIB Project Manager: Emily Seldomridge

Primary Project Partner Contacts:

Hassan Mirsajadi, WQ Modeler, DNREC -- Division of Watershed Stewardship, Workgroup member

Supporting Project Partner Contacts:

David Baird, Sussex Conservation District, Working Group

Latonya Gilliam, NPDES Engineer, DELDOT

Ed Kee, Dept. Secretary, Delaware Department of Agriculture, Working Group

Virgil Holmes, Division Director, DNREC -- Division of Water, Reviewer

Bob Scarborough, Program Manager, DNREC -- Coastal Program, Working Group

Susan Love, Climate and Sustainability Section Lead, DNREC -- Division of Climate and Energy, Working Group

TBD, US Army Corps of Engineers -- Region III, Working Group

Michael Craghan, USEPA -- Climate Ready Estuaries

Hans Medlarz, County Engineer, Sussex County, Working Group

Diane Hanson, Sussex County Association of Towns, Working Group

## DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Planning for Climate Change	1	B	
Administration	1	A	

Project Overview:

The project will co-occur with the Center's five-year CCMP update project and will be managed by the Center's Watershed Coordinator. A CCMP update steering committee will be formed using a similar process as was undertaken for the 2012 update. The committee will consist of representatives of the signatories of the CCMP as well as representatives of other important stakeholder groups. Focus will be on ensuring participation from stakeholders with expertise (particularly from the Department of Natural Resources and Environmental Control) in climate change and its impacts as well as expertise planning for climate change. The committee will review and synthesize progress on the CCMP and make recommendations for prioritizing remaining actions, developing new actions, and linking actions to the Center's Strategic Planning Process.

The methodology in Being Prepared for Climate Change: A Workbook for Developing Risk-Based Adaptation Plans will be used through Step 9. The assessment will influence the determination of what CCMP actions remaining to accomplish will be accomplished and how they will be accomplished. It will also influence what new actions are included in the update and how they will be accomplished.

### Project Overview:

Projects identified as a result of the assessment will also be included in the updated CCMP. The project will deliver a professionally produced vulnerability assessment included as an appendix to the 2017 CCMP Update.

The Watershed Coordinator will be the Steering Committee Chair and will be responsible for supporting the Committee. All facilitation and meeting preparation will be conducted by staff. A professionally designed project report as an appendix to the CCMP update will be produced and printed by contractors.

### Outputs/Deliverables:

1. Five meetings of the CCMP Update Steering Committee focused on climate vulnerability assessment and integration of assessment into updated CCMP actions.
2. Climate vulnerability assessment report included as an appendix in the updated CCMP.
3. Updated CCMP reflecting results of vulnerability assessment.

### Long-Term Outcomes:

1. EPA's goal is to ensure that no later than FY 2020, the CCMP of each NEP will be informed by a broad, risk-based vulnerability assessment and will include appropriate responses to assessment findings, which are to mitigate high risks or revise/drop goals that are at high risk.
2. Encouraging NEPs to undertake efforts to make their CCMPs climate resilient, i.e., to help ensure that CCMPs will be able to provide their intended protection and restoration benefits through time.

### Clean Water Act Programs:

Controlling Nonpoint Source Pollution on a Watershed Basis

Supporting Sustainable Wastewater Infrastructure

Identifying polluted waters and developing plans to restore them (total maximum daily loads)

Addressing diffuse, nonpoint sources of pollution

Protecting coastal waters through the National Estuary Program

Clean Water Act Program Implementation Role: Primary

### PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2017 EPA NEP Operating Grant		\$ 19,837.00	\$ 0.00	\$ 19,837.00
Totals:			\$ 19,837.00	\$ 0.00	\$ 19,837.00

### PROJECT PROGRESS

Beginning Date: 10/01/2016

Project Status: Proposed

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Internal kickoff meeting held	Not Initiated	05/17/2016	11/15/2016			
Stakeholder meetings completed, steering committee formed	Not Initiated	05/17/2016	12/15/2016			
Five monthly meetings held at CIB	Not Initiated	05/17/2016	06/15/2017			
Draft report complete	Not Initiated	05/17/2016	08/15/2017			
Report reviewed	Not Initiated	05/17/2016	09/15/2017			
Climate Vulnerability Analysis Released	Not Initiated	05/17/2016	10/01/2017			
Outreach	Not Initiated	05/17/2016	01/01/2018			

## Childhood Education

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Sally Boswell

Primary Project Partner Contacts:

Nancy Lucy, Director, BBNC, Town of Bethany Beach

Kimberlee Kleinstuber, Ingram Pond-STEM teacher, Indian River School District, School Coordinator

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Outreach and Education	2	A	1

Project Overview:

The James Farm Middle School Program at the James Farm Ecological Preserve is the centerpiece of our formal education program to reach schoolage children in the watershed. In 1999, we formed a partnership with the Indian River School District to offer outdoor, experiential learning opportunities on water quality, wetlands, and other watershed ecosystems to all 7th and 8th grade students; these are not field trips, but 'extension activities' that are curriculum-aligned to reinforce their classroom instruction. Classes are offered in the spring and fall, serving approximately 1000 children annually; for many students, this is their first experience on the Bays and it is both inspirational and instructive. We have a staff of teachers, most retired, certified teachers, whose passion for the program, knowledge of the content, and ability to engage students make the program one that is valued by both district teachers and their students.

In addition to our formal education program at James Farm, in 2009, the CIB established a formal partnership with the Town of Bethany Beach to provide watershed education and outdoor learning experiences at the town's Bethany Beach Nature Center. The CIB Education and Outreach Coordinator provides program and outreach support to the Director of the Bethany Beach Nature Center and resources to support watershed/wetlands education programs for their Saturday morning children's program and summer events for families. The CIB provides exhibits, brochures and other printed materials about the Inland Bays and watershed for use and distribution at the BBNC. Over 2,000 children and their families participate in programs or visit the Nature Center annually.

Located at the heart of the Inland Bays watershed in a rapidly developing area, it is our 'point of contact' location in the southern resort area to educate and inform residents and visitors about the unique coastal habitats of the Inland Bays watershed. Other joint projects at the BBNC include a native plant demonstration garden at the Center completed in 2006, a state of the art I-Wall interactive exhibit completed in 2007 on watershed habitats and a demonstration rain garden at the BBNC completed in 2011.

Outputs/Deliverables:

1. 800 to 1,000 middle students will receive a full day of curriculum-aligned instruction on water quality, wetlands, plant zonation, watershed ecosystems
2. Curriculum-aligned student activities are disseminated on the website for the use of home schoolers, scout troops and other organizations.

**Outputs/Deliverables:**

3. A partnership with Indian River School District and its four middle schools to provide watershed/estuarine science education on the Inland Bays in support of its science curriculum and our mission
4. Using our website and social media, direct residents and visitors to the BBNC for childrens programs, hands-on nature center experiences, and for the interpretive trails.
5. Maintain a BBNC page on our website and post the program schedule on our website monthly.
6. Provide instructional support and resources to the director of the BBNC to inform her on Inland Bays issues and programs.
7. Provide outreach/education materials to the BBNC for the benefit of residents and tourists who visit the Bethany Beach Nature Center

**Long-Term Outcomes:**

1. Students learn about the effects of water quality on the diversity and numbers of living organisms in the Inland Bays and that they may be altered by human activities.
2. Students understand how wetlands and streamside forests filter water as it runs off into local streams, rivers and bays or seeps into ground water.
3. Students are exposed to the estuarine ecosystems of the Inland Bays and understand their importance to the overall coastal environment.
4. Students understand and grasp abstract ecological concepts through hands-on experience.
5. Visitors, part time residents and new homeowners are introduced to the Inland Bays and their watershed through the exhibits, programs and interpretive trails at the BBNC.
6. Visitors are introduced to the CIB and our mission.

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2017 EPA NEP Operating Grant		\$ 16,301.34	\$ 0.00	\$ 16,301.34
DNREC	FY2017 DNREC Operating Grant		\$ 5,967.11	\$ 0.00	\$ 5,967.11
Totals:			\$ 22,268.45	\$ 0.00	\$ 22,268.45

**PROJECT PROGRESS**

Beginning Date: \_\_\_\_\_ Project Status: Proposed

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Register BBNC Director for DAEE and MAEOE conferences	Not Initiated	05/20/2016	01/15/2017			
Spr 17 Plan staffing-hire teacher if needed	Not Initiated	05/20/2016	03/15/2017			
Meet with BBNC Director to discuss program needs for Summer 17	Not Initiated	05/20/2016	04/15/2017			

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Spr 17 Schedule teachers	Not Initiated	05/20/2016	04/15/2017			
Fall 17-Send registration and program materials for fall semester	Not Initiated	05/20/2016	09/17/2017			
Fall 17 Plan staffing-hire teacher if needed	Not Initiated	05/20/2016	09/15/2017			
Fall 17-Inventory/secure equipment	Not Initiated	05/20/2016	09/15/2017			
Fall 17-Hold teacher prep day	Not Initiated	05/20/2016	09/15/2017			
Fall 17 Meet with IRSD to discuss curriculum	Not Initiated	05/20/2016	08/30/2017			
Evaluate Spr 17 semester	Not Initiated	05/20/2016	06/30/2017			
Deliver outreach materials to BBNC	Not Initiated	05/20/2016	05/01/2017			
Spr 17 Hold teacher prep day-inventory equipment	Not Initiated	05/20/2016	04/15/2017			
Fall 16 -Send registration and program materials for fall semester	Not Initiated	05/24/2016	09/17/2016			
Fall 2016-Hold teacher prep day	Not Initiated	05/24/2016	09/15/2016			
Fall 16-Inventory/secure equipment	Not Initiated	05/24/2016	09/15/2016			
Fall 2016-Schedule teachers for fall semester	Not Initiated	05/24/2016	09/09/2016			
Fall 2016-Plan for staffing-hire train teacher if needed	Not Initiated	05/24/2016	08/30/2016			
Spr 16-Evaluate 2015-16 program	Not Initiated	05/24/2016	06/30/2016			
Spr 16-Provide a full day of watershed education to 500 7th grade students	Initiated	05/24/2016	06/30/2016			
Spr 16-Inventory/secure equipment for spring 2016 semester	Completed	05/24/2016	04/15/2016			
Spr 16-Send registration and program materials for spring semester	Completed	05/24/2016	04/01/2016			
Fall 15-Provide a full day of watershed education to 450 8th grade students	Completed	05/24/2016	11/06/2016			
Work with BBNC Director to begin planning for 2016	Completed	05/24/2016	11/05/2015			
Provide the BBNC Director the opportunity to attend the DE Association of Outdoor Educators meeting	Completed	05/24/2016	03/01/2016			
Provide outreach/education materials for distribution. Inland Bays Journal when published	Completed	05/24/2016	03/30/2016			
Provide recommendations for five presenters for 2016 summer season	Completed	05/24/2016	03/31/2016			

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Recruit and hire a teacher to assist with Saturday programs for summer 2016	Initiated	05/24/2016	04/22/2016	06/30/2016		
Work with director to repair and update I-Wall exhibit	Initiated	05/24/2016	04/22/2016	07/30/2016		
Provide website and social media outreach support. Post on Facebook and Twitter monthly	Completed	05/24/2016	09/16/2016			
Provide instructional support for 5 water quality testing activities and five seining activities	Not Initiated	05/24/2016	09/16/2016			
Reach 1200 children/family members with watershed experience at BBNC in FY16	Initiated	05/24/2016	09/30/2016			

### Annual Report:

Our James Farm Middle School program continues to be the centerpiece of our formal education outreach to children in the watershed. It is well aligned with the 7th and 8th grade curriculum and has proven to be very effective at conveying abstract ecological concepts easily seen in the environment, but difficult to demonstrate in the classroom. We have a staff of highly experienced, skilled teachers who are passionate to share their knowledge with our students. This year, once again, we provided programming to four of the five middle schools in the Inland Bays watershed and served nearly 1,000 students and their teachers.

All of the schools we serve are located on the western side of our watershed away from the beach communities. These interior communities are very different demographically than the coastal beach communities which are wealthier and largely retirement age. Through this program, we reach a population that we don't reach through other programs. The schools have significant minority populations; nearly 50% of the students at one of the schools are Hispanic. Many of these children are new arrivals to this area and our program is an important opportunity to introduce them to this place that they live and lay the groundwork for their stewardship.

Because the program is outdoors, we lose some teaching days that are cancelled by the schools due to rain. Unfortunately, due to testing schedules and school calendars, many of these cannot be re-scheduled, so in rainy springs such as this one, some teaching days are lost and some money that was budgeted for teachers must be carried over to the next budget year. Looking ahead, the program will benefit greatly by the addition of amenities that are included in the James Farm Master Plan which include upgrades to facilities used by this program.

Our partnership with the Bethany Beach Nature Center continues to provide us with an outstanding outreach point of contact in the coastal resort area to reach approximately 2,000 visitors annually. The focus has changed in recent years under the current director, with more emphasis on 'crowd-pleasing' big programs and events, but these are all themed on topics aligned with our mission; this year including

Testing the Waters, Seining at James Farm Preserve, and World Wetlands Day Celebration.

I continue to be an education resource to the director, sending her to environmental education workshops and connecting her with expert presenters to lead programs. It is a unique arrangement that serves our education/outreach goals at modest cost to our program.



# Dewey Beach Stormwater Master Plan Phase II

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## MANAGEMENT AND PARTNERS

CIB Project Manager: Emily Seldomridge

Primary Project Partner Contacts:

Larry Trout, RK&K, Lead Planner/Contractor

Supporting Project Partner Contacts:

Latonya Gilliam, NPDES Engineer, DELDOT, Technical Assistance

Marc Appelbaum, Town Manager, Town of Dewey Beach

Silvana Croope, Climate Assessment, DELDOT, Technical Assistance

Jim Tyler, Infrastructure Committee, Town of Dewey Beach

## DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area

Stormwater Management

Objective

1

Action

B

SubAction

Project Overview:

Dewey Beach is a small coastal community that is home to fewer than 400 year-round residents, and a beach and bay destination for over 1.2 million visitors annually. Since its incorporation in 1981, Dewey Beach has experienced intense development to accommodate the seasonal influx of visitors. Development brought an increase in impervious cover, which has soared over 10%, the widely cited threshold where a decrease in water quality begins. During storm events, precipitation rapidly runs off into storm drains that empty into Rehoboth Bay. In addition to causing localized flooding, the untreated stormwater delivers a significant amount of nutrients and sediments to the bay (nonpoint source pollution).

The stormwater infrastructure of Dewey Beach is now aged, lacks green infrastructure, and in many cases, undersized for the amount of impervious surface. In the face of rising sea levels and climate change, the incorporation of resilient and sustainable green infrastructure is critical. In 2011 a Stormwater Master Plan for Nutrient Reductions was written. While it inventoried the stormwater infrastructure by street, the green infrastructure components are lacking in scope and innovation, and there is no strategy to implement the identified stormwater best management practices (BMPs). Phase II of Dewey Beach Stormwater Planning will incorporate innovative BMPs, prioritize implementation through stakeholder input, develop a phased implementation strategy, and provide preliminary engineering of top priority projects.

The objective of this proposal is to develop a prioritized green infrastructure stormwater plan. This second stage of planning will draw from the first stormwater master plan that inventoried the existing stormwater management by street, and identified possible BMPs to address stormwater management and nutrient reductions. The second stage of planning will take a two-pronged approach and consider both innovative stormwater BMPs, but also living shoreline techniques to help attenuate sediment and nutrient loads. Once applicable BMPs are incorporated into the plan, a ranking criteria will be developed to assess the implementation priorities. The assessment will be

**Project Overview:**

facilitated by the consultants, and completed by stakeholders including representatives from the Center for Inland Bays, Town of Dewey Beach, and the McKinley/Read Task Force Group, a volunteer citizen group. Preliminary engineering will be completed for the top priority projects.

No EPA funding is currently budgeted for this project, but development of the Surface Water Matching Planning grant was made possible through the general program of the Watershed Coordinator that is funded by the EPA.

**Outputs/Deliverables:**

1. Stormwater master plan for nutrient reductions with a prioritized/phased implementation strategy,
2. Preliminary engineering for top ranked project(s),
3. Press release and 2 social media posts on project outcome

**Long-Term Outcomes:**

1. Reduction in nutrient loading to Rehoboth Bay,
2. Mitigation of nuisance flooding,
3. Leveraging of resources to increase grant funding to implement stormwater BMPs

**Clean Water Act Programs:**

Controlling Nonpoint Source Pollution on a Watershed Basis

Addressing diffuse, nonpoint sources of pollution

Protecting coastal waters through the National Estuary Program

Clean Water Act Program Implementation Role: Primary

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
DNREC	Surface Water Matching Planning		\$ 50,000.00	\$ 0.00	\$ 50,000.00
Town of Dewey Beach	Dewey Beach Stormwater Master	Marc Appelbaum	\$ 50,000.00	\$ 3,136.00	\$ 53,136.00
DeIDOT	FY2017 DeIDOT Match		\$ 0.00	\$ 1,205.00	\$ 1,205.00
Totals:			\$ 100,000.00	\$ 4,341.00	\$ 104,341.00

**PROJECT PROGRESS**

Beginning Date: 06/01/2016                      Project Status: Proposed

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Kickoff meeting	Not Initiated	05/17/2016	06/30/2016			
Develop stormwater BMP list	Not Initiated	05/17/2016	10/31/2016			
Draft prioritized, phased implementation plan	Not Initiated	05/17/2016	02/28/2017			

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Final report	Not Initiated	05/17/2016	05/31/2017			

## Environmental Monitoring

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Marianne Walch

#### Primary Project Partner Contacts:

Andy Howard, Environmental Scientist, DNREC -- Watershed Assessment Section -- WMAP, Collaborator

John Schneider, Watershed Assessment Section Manager, DNREC -- Division of Watershed Stewardship, State coordination

David Wolanski, Environmental Scientist, DNREC -- Division of Watershed Stewardship, WQ data management

Tina Callahan, Lead Scientist, Delaware Environmental Monitoring & Analysis Center, Data management coordination

Sheila Eyley, US Fish & Wildlife Service, HSC tagging study lead

#### Supporting Project Partner Contacts:

Jordan Zimmerman, Environmental Scientist, DNREC -- Division of Fish and Wildlife, Technical Assistance

Michael Greco, Environmental Scientist, DNREC -- Division of Fish and Wildlife, Technical assistance

Ed Whereat, Program Coordinator, University of Delaware -- Citizen Monitoring Program, CMP coordination

Ed Hale, Biometrician, DNREC -- Division of Fish and Wildlife, Statistical analyses

Joe Rogerson, SCRP Wildlife Program Manager, DNREC -- Division of Fish and Wildlife, Citizen science planning assistance

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Water Quality Management	6	C	
Water Quality Management	6	A	
Planning for Climate Change	1	D	
Outreach and Education	4	B	

#### Project Overview:

The Clean Water Act establishes the National Estuary Program (NEP) to promote long-term planning and management of nationally significant estuaries threatened by pollution, development, or overuse. Section 320 of the Clean Water Act requires the development of a Comprehensive Conservation and Management Plan for the estuary. It also establishes requirements to monitor the effectiveness of actions taken pursuant to the plan. This monitoring is guided by a monitoring plan, and data are used to characterize the estuary, to monitor the effectiveness of projects and programs, and to produce State of the Estuary Reports.

The Center for the Inland Bays (CIB) leverages a number of environmental monitoring programs conducted by state agencies and other partners. However, the CIB plays a significant role in management and/or implementation of some of the Inland Bays environmental monitoring programs. Currently these include several citizen science programs and a long-term project to monitor the health of tidal salt marshes.

## Project Overview:

Environmental monitoring projects include:

### 1. Inland Bays Monitoring Plan

During the Center for the Inland Bays (the Center's) original CCMP development process that culminated in 1995, the Inland Bays Monitoring Plan was produced. The plan assembled the metadata of relevant environmental parameters collected at the time and put forth hypotheses for their change based on CCMP implementation. Since then, collection of additional relevant parameters has been initiated, responsibilities for collection have changed, and both monitoring technology and the scientific understanding of the Bays have evolved significantly. This requires that the Plan be revised and provides an opportunity to re-engage stakeholders around its cooperative implementation.

This project will revise the plan to monitor the condition of the Inland Bays Estuary and Watershed used to evaluate the overall effectiveness of the CCMP. The plan will: serve a blueprint for monitoring activities that relate to the mission of the Center; consider data that are both used for environmental indicators for the Inland Bays and useful data that are not currently used for environmental indicators; consider data gaps; and make recommendations for data synthesis and for coordination among those organizations involved in data collection, processing and analysis, storage and provision, and presentation.

Update of the monitoring includes a number of concurrent activities. Review of the original Inland Bays Monitoring Plan will occur prior to plan development. A facilitated discussion or series of discussions with representatives of organizations involved in all aspects ambient water quality monitoring in the Inland Bays will also be a priority set of actions. The process initiated is intended to be ongoing through the formation of a Scientific and Technical Advisory Committee (STAC) water quality monitoring subcommittee.

### 2. Long-term Continuous Saltmarsh Monitoring in the Inland Bays

A long-term continuous monitoring site is being managed in a representative fringing saltmarsh of the Inland Bays to gather baseline data hydrology and marsh elevation and to relate these parameters to each other, sea level rise, and any potential new sudden wetland dieback events that may occur in this or other marshes of the Inland Bays. Two continuous monitoring stations will record ground water and surface water depth. Three marshes have been instrumented with three sediment elevation tables each to monitor changes in marsh elevation and are monitored at least annually. The project will provide needed background data on the natural variation in the above parameters and their interactions. The project will attempt to relate these parameters to each other, sea-level rise and potential new sudden wetland dieback events to better understand the stressors affecting the highly impacted saltmarshes of the inland Bays. Data will determine if marshes are able to accrete elevation to keep pace with sea level rise and ultimately persist. The project has been ongoing since 2008.

Due to staffing shortages at CIB in 2016, a sub-award agreement was established with the Delaware Dept. of Natural Resources and Environmental Control (DNREC) Wetlands Monitoring and Assessment Program for collection and transmission of project data. This Program is funded primarily through EPA Wetlands Program Development Grants, and DNREC is responsible for complying with the Clean Water Act. The project is governed by a Quality Assurance Project Plan developed jointly by DNREC and CIB. In 2017, responsibility for data collection will gradually be transferred back to CIB, as staffing allows.

## Project Overview:

### 3. Inland Bays Horseshoe Crab Survey and Tagging Project

The annual Inland Bays Horseshoe Crab Survey is an important component of the Center's Citizen Science Program. The program was established in 2008 and contributes valuable population data needed for local and regional conservation efforts. The surveys are conducted by CIB volunteers at five sites on all three bays. Surveys are done for three nights around the New Moon and Full Moons in May and June, for a total of twelve surveys which are led by six trained, volunteer site leaders and approximately 50 to 60 volunteers. Coordination of volunteers, data quality control and analysis, and reporting are managed by CIB's science staff. A Quality Assurance Project Plan was developed for the survey.

This project also includes collaboration with the U.S. Fish and Wildlife Service to tag 400-1000 crabs each year and reporting sightings of tagged animals. The tagging studies provide additional data for the management of horseshoe crabs and their habitat up and down the Atlantic coast.

Project partners' roles include providing technical assistance, updating the CIB on current Horseshoe Crab research, and reviewing data analyses.

### 4. Shorezone Fish and Blue Crab Survey Project

This is a long-term citizen science program, begun in 2011, to study the shorezone fish and blue crab communities of the Inland Bays. The shorezone fish community has its own unique characteristics and responses to water quality. In the past it has been studied sporadically, but no long term data exists to analyze for trends in community composition.

These seining surveys are conducted by CIB volunteers at 16 fixed locations throughout the three Inland Bays and tributaries. Seine samples are collected at each of the 16 sites bi-monthly, from May through October, plus one sample in late April, for a total of 208 samples annually. Surveys are led by trained, volunteer site leaders and approximately 40 to 50 volunteers. Coordination of volunteers, data quality control and analysis, and reporting are managed by CIB's science staff. A Quality Assurance Project Plan was developed for the survey. A steering committee that includes both state and university fisheries biologists meets annually to review the survey protocols and data.

Data from these surveys will help determine community structures, temporal variations, and long-term trends. This survey will complement current fisheries research conducted by Delaware Division of Fish and Wildlife, and past research done by the University of Delaware. Furthermore, it will allow for data on the nearshore zones in the bays that have not previous been monitored regularly.

### 5. Ambient Water Quality Monitoring

Since 1991, the University of Delaware Sea Grant Marine Advisory Service's Citizen Monitoring Program (CMP) has been collecting samples at water quality monitoring sites throughout the Inland Bays watershed. Citizen monitors collect important data including dissolved oxygen, dissolved inorganic nitrogen, dissolved inorganic phosphorus, water clarity, bacteria levels, and other environmental data. CMP data are used, along with data from other sources, for status and trend analyses in the CIB's 'State of the Inland Bays' reports, which are published every five years. In addition, CMP data are being used to develop indicator reports for each of the CIB's

## Project Overview:

Your Creek projects. The CIB also has a goal of having the CMP nutrient data incorporated into analyses for DNREC's 305b reports.

Due to budget and staffing cuts, the CMP has not been able to keep up with nutrient analyses and had accumulated a backlog of filtered frozen samples. In 2015, they were 1 to 3 years behind on analyses, depending on the site. Longer term changes in CMP mission and budget will further limit any staff time that could be devoted to nutrient analyses. Therefore the CIB will provide support to CMP for analysis of backlogged nutrient samples taken at nine stations that are key for producing our State of the Bays and Your Creek indicator reports. Support will also be provided to continue nutrient analyses at these nine stations and to reactivate one key station in Herring Creek that was recently discontinued by CMP.

In addition, the Center will assist in securing funding needed to convert the current, outdated CMP database to a supported, sustainable format that allows online entry/sharing of water quality data and inclusion of important metadata. Ideally conversion will be made to a database compatible with the Delaware Water Quality Portal (<http://demac.udel.edu/waterquality/>), through which the public can search and download water quality monitoring data collected by DNREC's Surface Water Quality Monitoring Program. Ideally the new database will include an online site for volunteer monitors to enter their measurements directly, with data validation, thereby improving both quality control and program efficiency.

## 6. Citizen Science Strategic Plan

The CIB's three-year strategic plan calls for the Center to explore expansion of citizen science opportunities in 2016 and beyond. In order to do this in a strategic way, that is cost-effective and ensures that data collected will be useful, a planning exercise will be undertaken to address the following issues:

- Leveraging volunteer monitoring data to address priority issues for the Inland Bays (e.g., eutrophication, climate change, and habitat loss), and to fill in data gaps;
- Using citizen science to enhance the quality and long-term availability of data needed for State of the Bays reports;
- Leveraging the Your Creek program to expand citizen science opportunities;
- Using citizen science to meet education and outreach and development goals;
- Incorporation of new technologies, such as mobile apps;
- Leveraging partnerships with other groups and agencies in the state/region that manage, or use data from, citizen science programs;

To accomplish these goals, the Center will convene stakeholders and partners in a one-day, facilitated workshop to discuss the status, needs, and potential of citizen science programs in the Inland Bays. The outcome of this workshop will be a report containing an assessment of data needs in the Inland Bays that might be addressed through volunteer programs, and recommendations for a strategic expansion of citizen science in the Inland Bays watershed. The report will include recommendations for partnerships, funding opportunities and data management. Center staff will also attend and present at the Citizen Science Association's CitSci2017 to network with citizen science leaders from other areas. The final deliverable will be a Citizen Science Strategic Plan for the Inland Bays.

### Outputs/Deliverables:

1. Final Inland Bays monitoring plan.
2. Formation of a monitoring subcommittee of the STAC, which will provide regular review of the monitoring plan and data.

**Outputs/Deliverables:**

3. Fully operational, long-term, continuous hydrological marsh monitoring site and annual data collection and analysis.
4. Network of three marsh elevation monitoring stations in the Inland Bays and annual data collection and analysis.
5. Annual collection by the CMP of water quality data, including inorganic nitrogen and phosphorus, at ten key Inland Bays stations.
6. Development of an updated, supportable database structure for the CMP, and online availability of CMP data to the public.
7. Annual completion of horseshoe crab and fish surveys and data reports.
8. Twice yearly publicity about the citizen science surveys in local media.
9. Public outreach through informal communication, formal presentation, and distribution of citizen science educational brochures.
10. Status and trend reports for each monitoring program every 5 years.
12. Published Citizen Science Strategic Plan for the Inland Bays.
13. Funding and database update to make the CMP Program sustainable.

**Long-Term Outcomes:**

1. Improved monitoring of water quality, habitat, and natural resources in the Inland Bays watershed.
2. Increased understanding of inter-relation of tidal saltmarsh parameters and capacity for the elevation of marshes to keep pace with sea level rise.
3. Use of horseshoe crab spawning and fish/crab community data to support better management and conservation of living resources and critical habitats.
4. Long-term nutrient and living resources trend analyses for 'State of the Inland Bays' and Your Creek indicator reports.
5. Assessment of progress toward achieving goals of the Inland Bays Pollution Control Strategy and meeting TMDLs.
6. Update and calibration of Inland Bays water quality models.
7. Increased engagement of Inland Bays watershed residents and users.

**Clean Water Act Programs:**

Improving Water Quality Monitoring

Protecting wetlands

Protecting Large Aquatic Ecosystems

Clean Water Act Program Implementation Role: Primary

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2017 EPA NEP Operating Grant		\$ 74,414.18	\$ 0.00	\$ 74,414.18
DNREC	FY2017 DNREC Operating Grant		\$ 1,250.00	\$ 0.00	\$ 1,250.00
Totals:			\$ 75,664.18	\$ 0.00	\$ 75,664.18

**PROJECT PROGRESS**

Beginning Date: 10/01/2016

Project Status: Proposed



Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Inland Bays Monitoring Plan updated	Initiated	05/18/2016	07/31/2016			
Mechanism for update of monitoring plan established through STAC	Initiated	05/18/2016	10/31/2016			
Citizen science planning workshop held	Not Initiated	05/18/2016	11/30/2016			
Attendance/presentation at Citizen Science Conference	Not Initiated	05/18/2016	02/25/2017			
Final published Citizen Science Strategic Plan for the Inland Bays	Not Initiated	05/18/2016	05/01/2017			
New CIB citizen science brochure produced	Not Initiated	05/18/2016	09/30/2017			
Annual publication to CIB website of citizen science monitoring results	Initiated	05/18/2016	02/28/2017			
Status and trend reports for each CIB-led monitoring program every 5 years	Initiated	05/18/2016	12/31/2016			
Development of new database structure for Citizen Monitoring Program	Not Initiated	05/18/2016	12/31/2017			
Citizen Monitoring Program data available to public online	Not Initiated	05/18/2016	12/31/2017			
Funding secured to update CMP database	null	05/25/2016	01/01/2017			

#### Annual Report:

Completion of the monitoring plan update was delayed by other priorities. The STAC provided input on the proposed revisions at its December 2016 meeting. A plan draft was developed with assistance from RK&K, but additional work is needed to finalize it for review by STAC. \$10,000 (FY2015 EPA funds) was reallocated from the 'Migratory Fish Passage Designs for Dams on the Tributaries of the Inland Bays' project to this one, in order to allow RK&K to assist the Center in finalizing the plan. We are currently on track to complete the final revised plan in July. The STAC chair will convene a subgroup to review the final plan.

The Long Term Salt Marsh Monitoring project is on track with no delays. Contracts were completed with DNREC for assistance and oversight for the Spring of 2016. A QAPP for the project was finalized, and has been submitted to EPA. All sediment elevation tables (SETs) and water level loggers were assessed for damage, and were repaired or replaced in Spring 2016. Measurements were recorded for the Spring of 2016. Data from SET installation in 2008 through the Spring of 2016 are currently being analyzed, and reporting is on track for completion by 12/1/2016.

The annual Horseshoe Crab Survey and Tagging Project is on track with minor delays in completing the data reports. A new Environmental Scientist was hired to manage the surveys, data analyses and reporting. 2016 survey volunteers and team leaders received training through an orientation meeting in the Spring of 2016. Data collection for 2016 has begun, and will follow the Delaware Bay protocol and schedule. 1000 horseshoe crabs will be tagged again, with tags provided by the US Fish and Wildlife. Data from all previous surveys has been aggregated and is currently being analyzed. An updated QAPP for the project was completed and submitted to EPA. Annual reports for 2014 and 2015 have been initiated, and will be completed by Fall 2016.

## Annual Report:

The Shorezone Fish and Blue Crab Survey project has also experienced delays in reporting due to the a staffing shortage caused by the death of the former project lead. The Center's new Environmental Scientist took over management of this survey in February, and has completed the overdue 2013 and 2014 reports. These are being reviewed by the survey steering committee. 2015 data will be included in a five-year trend report, which is being worked on. Volunteers and team leaders have received training for this season, and collection of data for 2016 has begun. An updated QAPP was finalized and submitted to EPA, and the steering committee has convened to discuss the future of reporting the results from this project.

The Center will continue to assist the University of Delaware with cost of nutrient sample analyses for Citizen Monitoring Program stations in the Inland Bays. Data from this volunteer monitoring program is a critical component of both the State of the Bays report and the Your Creek indicator reports. Staffing shortages at the University, and the long-term illness of the program's manager, threatened to delay delivery of water quality data needed for the State of the Bays report, so the Center hired a contractor to download and deliver the required data to us in April.

## Inland Bays CCMP Revision

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Emily Seldomridge

Primary Project Partner Contacts:

Robert Palmer, Division Director, DNREC -- Division of Watershed Stewardship, Steering Committee

Supporting Project Partner Contacts:

David Baird, Sussex Conservation District, Steering Committee

Nancy Laurson, USEPA National Estuary Program, Technical Assistance

Julie Wheatley, Sussex County Economic Development, Steering Committee

Ed Kee, Dept. Secretary, Delaware Department of Agriculture, Steering Committee

Hans Medlarz, County Engineer, Sussex County, Steering Committee

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Administration	1	A	

Project Overview:

The original Comprehensive Conservation and Management Plan (CCMP) was completed in 1995 and not revisited until 2012 when a large scale revision and update was conducted. The original CCMP identified eutrophication and habitat loss as the priority problems facing the Inland Bays. Although these problems remain today, emerging issues, changes in population and landuse, new knowledge and understanding gleaned from research, and the development of new technologies to address these problems require regular updates to the CCMP. Because of the rapid changes in the watershed, the decision was made in 2012 to update the CCMP every 5 years. Since many of the goals and objectives of the 1995 CCMP and 2012 Addendum remain relevant, the 2017 update will result in another addendum. The updated CCMP will be used in the Broad, Risked-Based Climate Change Vulnerability Assessment of the Inland Bays CCMP.

The Center's Watershed Coordinator will facilitate the CCMP update and form a Steering Committee to guide the process. To inform the Committee of current issues, the Coordinator will draw from the 2016 State of the Bays report (the most comprehensive assessment of the condition of the Inland Bays) and assessment of the implementation of the Inland Bays Pollution Control Strategies (a list of actions with the intent to meet Total Maximum Daily Loads). The general public will be invited to participate through the Center's website and at a public meeting. EPA funds are budgeted for the update process, as well as the design and printing of the addendum.

Outputs/Deliverables:

1. Addendum to the Delaware Inland Bays CCMP, 2. Press release and social media posts on outcome of CCMP revision.

Long-Term Outcomes:

1. Increased awareness by the general public and responsible agencies about progress towards implementing the CCMP,
2. Reduction in nutrient loading to the Inland Bays,
3. Protection of critical habitat in the Inland Bays.

Clean Water Act Programs:

- Controlling Nonpoint Source Pollution on a Watershed Basis
- Strengthening National Pollutant Discharge Elimination System Permits
- Strengthening Water Quality Standards
- Supporting Sustainable Wastewater Infrastructure
- Identifying polluted waters and developing plans to restore them (total maximum daily loads)
- Addressing diffuse, nonpoint sources of pollution
- Protecting wetlands
- Protecting coastal waters through the National Estuary Program
- Clean Water Act Program Implementation Role: Primary

PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2017 EPA NEP Operating Grant		\$ 13,140.00	\$ 0.00	\$ 13,140.00
Totals:			\$ 13,140.00	\$ 0.00	\$ 13,140.00

PROJECT PROGRESS

Beginning Date: 10/01/2016      Project Status: Proposed

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Convene CCMP steering committee	Not Initiated	05/27/2016	11/30/2016			
Draft CCMP Addendum	Not Initiated	05/27/2016	04/30/2017			
Final CCMP Addendum	Not Initiated	05/27/2016	09/01/2017			
STAC and CAC review of draft CCMP Addendum	Not Initiated	05/27/2016	07/31/2017			

## Living Shoreline Initiative

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Marianne Walch

#### Primary Project Partner Contacts:

Alison Rogerson, Environmental Scientist, DNREC -- Watershed Assessment Section -- WMAP, Collaborator

Danielle Kreeger, Science Director, Partnership for the Delaware Estuary, Collaborator

Douglas Janiec, Natural Resources Program Manager, Sovereign Consulting, Inc., Contractor (LSL siting study & project

Sunny Jardine, Assistant Professor, University of Delaware -- College of Earth, Ocean, and Environment, Contractor

Gina Kyles, Director, Banks Harbor Marina, Inc., Property owner, Banks Harbor Marina Project

#### Supporting Project Partner Contacts:

David Baird, Sussex Conservation District, Collaborator

Jim Sullivan, Planner, DNREC -- Division of Watershed Stewardship, Funding manager

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Managing Living Resources and Their Habitat	2	H	3
Managing Living Resources and Their Habitat	2	H	2
Managing Living Resources and Their Habitat	2	H	1
Managing Living Resources and Their Habitat	2	H	5

#### Project Overview:

The shorelines of Rehoboth, Indian River, and Little Assawoman Bays and their tributaries have experienced extensive shoreline erosion as the result of boat wakes, sea level rise, and storm wave action. Shoreline property owners have traditionally defended their shorelines from erosion by hardening them with stone rip-rap, or with wood or metal bulkheads. But these techniques have an environmental cost; they eliminate sandy beaches and salt marsh habitats that are so important to many marine animals, and they don't filter pollutants from surface runoff.

Our goal in this project is to promote the use of living shorelines as the preferred technique for addressing shoreline erosion on the Inland Bays and their tributaries so that shoreline residents understand the benefits in maintaining a living shoreline.. To accomplish this, we will identify and train professionals who are the first point of contact for waterfront property owners seeking advice about stabilizing their shoreline; these include marine contractors, landscape architects and contractors and real estate professionals. We will accomplish this through a presentation to realtors, open house and site visits to demonstration projects, and partnering with contractors on demonstration projects. The goal, to have them understand the cost and benefits of living shorelines.

We will also educate and inform HOA's and shoreline property owners about the practical and esthetic benefits of living shorelines and

## Project Overview:

promote the use of living shorelines as the preferred technique for addressing shoreline erosion. This will be accomplished through implementation of a comprehensive education/outreach campaign to include: placement of photos and stories in print, broadcast and social media; promotion of web content, direct mail to shoreline residents and, presentations to community groups.

To enhance the Center's promotion of living shorelines, a series of projects will be created to demonstrate living shoreline techniques, across a variety of shoreline energy regimes, in the developed landscape along the Inland Bays. The purpose of the projects is to improve water quality through shoreline stabilization and ecosystem enhancement, while providing public education and shoreline contractor training opportunities. The first of these living shorelines, at the Bethany Beach Loop Canal, was completed in 2015. Funding was secured in early 2016 from the Community Water Quality Improvement Grant program to construct a second living shoreline demonstration project at the Banks Harbor Marina in Ocean View. Evaluation of the marina property indicates that it is an ideal location to demonstrate some innovative living shoreline approaches, including use of floating treatment wetland mats to create and stabilize new marsh edge and reuse of dredge spoils from the marina channel. Additional living shoreline demonstration project sites will be identified in the "Living Shoreline Siting and Concept Design Plan" completed in FY 2016. Funding for at least two of these additional projects will be sought in FY 2017, and the Center will work with property owners, funding partners and contractors to implement the projects.

## Outputs/Deliverables:

1. Produce outreach materials including educational video, banner, exhibit, and postcards to use at community meetings, community events, libraries and other points of contact.
2. Produce an information piece for mass mailing to 6,000 shoreline property owners.
3. A social media campaign on all platforms is implemented to include 10 facebook posts, 10 Instagrams and 20 twitter posts to drive traffic to our LS webpage
4. Continue outreach and education of marine contractors by inviting them to open house events at two LS projects.
5. Design, permitting and construction of six living shoreline demonstration sites in the Inland Bays, to be used for public outreach and contractor training.
6. Final project report and press event for each LSL demonstration.

## Long-Term Outcomes:

1. Increased awareness and acceptance of living shorelines among waterfront property owners as the preferred method of shoreline stabilization.
2. Statewide policy requiring use of living shorelines wherever feasible.
3. Increase in the length of shorelines that are managed with living shoreline techniques, as measured through tracking of shoreline alteration permits.
4. Increased acreage of tidal wetlands along shorelines, providing ecosystem services such as nutrient reduction and carbon sequestration.
5. Increased wildlife habitat for shorebirds, fish and aquatic invertebrates.

## Clean Water Act Programs:

Addressing diffuse, nonpoint sources of pollution

Protecting wetlands

Clean Water Act Programs:

Protecting coastal waters through the National Estuary Program

Protecting Large Aquatic Ecosystems

Clean Water Act Program Implementation Role: Primary

PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2017 EPA NEP Operating Grant		\$ 31,011.86	\$ 0.00	\$ 31,011.86
DNREC	FY2017 DNREC Operating Grant		\$ 18,367.43	\$ 0.00	\$ 18,367.43
DNREC	Community Water Quality	CWQIG 15-03	\$ 56,173.50	\$ 0.00	\$ 56,173.50
Totals:			\$ 105,552.79	\$ 0.00	\$ 105,552.79

PROJECT PROGRESS

Beginning Date: 10/01/2016

Project Status: Proposed

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Publication and video are produced	Not Initiated	05/18/2016	09/30/2017			
Mailing to 6,000 shoreline property owners is completed	Not Initiated	05/18/2016	06/01/2017			
Exhibits are scheduled and implemented at 3 libraries	Not Initiated	05/18/2016	09/30/2017			
Presentations are made to 3 community groups	Not Initiated	05/18/2016	09/30/2017			
Open house event for contractors held at LS demonstration site	Not Initiated	05/18/2016	12/31/2016			
Completion of Banks Harbor Marina demonstration project	Initiated	05/18/2016	06/30/2017			
Funding secured for two additional demonstration projects	Not Initiated	05/18/2016	01/31/2017			
A social media campaign to include 10 facebook posts, 10 Instagrams, 20 twitter posts is completed	Not Initiated	05/20/2016	09/30/2017			
Economic and ecological benefits of LSL white paper complete	Initiated	05/25/2016	12/31/2015	05/01/2016	10/01/2016	
Funding for LSL Siting and Concept Design Plan secured	Completed	05/25/2016	12/31/2015			
Watershed GIS analysis/ranking to identify candidate LSL demo project sites	Completed	05/25/2016	11/01/2015	05/01/2015		
Final LSL siting plan and concept designs	Initiated	05/25/2016	02/01/2016	07/30/2016		

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Produce Living Shorelines exhibit	Completed	05/25/2016	10/02/2016			
Get input/recommendations from local contractors about new training opportunities	Completed	05/25/2016	10/15/2016			
Incorporate living shorelines into general powerpoint presentation	Completed	05/25/2016	10/15/2015			
Meet with partners to plan followup to the 2015 marine contractor training	Completed	05/25/2016	10/15/2015			
Liv Shoreline presentation highlighting the practical and esthetic benefits of LS is developed	Initiated	05/25/2016	10/30/2015	09/30/2015		
Develop a list of marine contractors trained in LS as a resource for property owners.	Initiated	05/25/2016	03/30/2016	07/30/2016		
Identify five communities on the Bays and provide living shorelines info through HOA	Initiated	05/25/2016	09/30/2016			
Provide a two day LS Training workshop to marine contractors and landscape architects	Completed	05/25/2016	03/31/2016			

#### Annual Report:

Included in the Living Shoreline (LSL) Initiative are several projects that were part of the FY 2016 work plan and will be completed in FY 2016. These are the LSL Siting and Concept Design Plan, the Ecological and Economic Benefits of LSL White Paper. Progress on these to date is provided below. Another FY 2016 project, Shoreline Condition Assessment of Little Assawoman Bay and Update of Indian River Bay, was cancelled. We were unsuccessful in obtaining external funding for this project, and it was determined that the data that were to be collected were not critical for the selection of LSL demonstration sites.

Funding for the LSL Siting and Concept Design Plan was awarded from the state's Surface Water Matching Planning Grant program. An additional \$20,000 was provided by the Division of Watershed Stewardship to include a report on sites for potential reuse of dredge materials in LSLs. The project began in February and is on track to be completed in July. Sovereign Consulting Inc. was selected to conduct the study and develop concept designs. A kick-off meeting with Sovereign and other partners was held on February 16th. A meeting with the DNREC Waterways Management section was held on February 9th to discuss the dredge reuse portion of the work. 72 potential sites for LSL demonstration projects resulted from a first-level geospatial screening of the watershed, based primarily on access criteria. Project partners have provided input on selection and weighting of second-tier screening criteria, which will be used to narrow the pool of potential sites to six. Once these are selected, field visits will be conducted, and concept designs for LSL's at each site will be developed.

\$6,800 of funding to support the Ecological and Economic Benefits of LSL White Paper has been obtained as part of an EPA HQ grant, "Blue Carbon Storage in Natural Estuarine Wetlands and Living Shorelines of Delaware and New Jersey," awarded to the three regional NEPs. The white paper portion of the work will be completed over the summer through a contract with the University of Delaware.

Funding for a LSL demonstration project at the Banks Harbor Marina in Ocean View, DE, on White Creek, was obtained through a Community Water Quality Improvement Grant. The project began with a kickoff meeting with the contractors and marina owners on April



## Annual Report:

4th. Site characterization, including bathymetric survey and sediment analyses occurred in April and early May. Design and permitting will occur over the summer, with construction scheduled for late fall.

We conducted a two-day technical training on the design, permitting and installation of living shorelines to 34 marine contractors, engineers and landscape architects in March 2016. The agenda included presentations on site evaluation, state and federal permitting, monitoring for project goals, and business models. Site visits to local projects were also included. This is the second year that we have offered this training with our partners at DNREC and we found that interest in this training is growing each year. We had a wait list for this workshop, many from within partner organizations around the state.

We designed and produced a living shoreline exhibit and banner for use at outreach events, as well as a 3 dimensional life model of a living shoreline that has attracted great interest. Exhibit was displayed at the statewide 2016 Wetlands Conference and the 2016 Gardening for the Bays Native Plant Sale.

## Microbial Source Tracking, Love Creek

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Marianne Walch

Primary Project Partner Contacts:

Mike Bott, Environmental Scientist, DNREC -- Division of Watershed Stewardship

Kathy Knowles, Laboratory Manager, DNREC -- Environmental Lab, Project Manager

Supporting Project Partner Contacts:

Ed Whereat, Program Coordinator, University of Delaware -- Citizen Monitoring Program, Volunteer support

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Wastewater Management	3	F	
Outreach and Education	5	A	

Project Overview:

Love Creek is a tributary located in the northwestern portion of Rehoboth Bay. The watershed drains 18,528 acres of mixed land uses including agricultural, forest and residential. Over the last several decades, land use trends have seen a significant increase in residential areas and respective decreases in agricultural and forested lands. Love Creek and its tributaries currently are listed as 'impaired' under the federal Clean Water Act for bacteria and nutrients.

Excessive levels of indicator bacteria in Love Creek have been a particular concern both for state regulatory agencies and for watershed residents. Average summer Enterococcus levels consistently exceed the safe swimming standard. The average levels have increased significantly over time. In 2013, DNREC ordered a portion of Love Creek closed to all commercial and recreational shellfish harvesting due to increased bacteria levels. The sources of the bacteria and the reason for the increase are unclear, but projected development in the Love Creek watershed may increase the proportion of human sources.

In December 2013, DNREC's Watershed Assessment and Management Section collected water samples at four locations in Love Creek and analyzed them for the presence of species specific biomarkers of fecal contamination. This study determined that during at least some environmental conditions, gulls, humans and dogs can all be important contributors to fecal pollution in the tidal and non-tidal portions of Love Creek. Effective control of bacterial pollution in Love Creek will require a better understanding of specific sources. The source tracking study conducted in 2013 was only a snapshot of the fecal bacteria contributors to the watershed during a one-time sampling in winter. To fully understand the complex dynamics of fecal pollution in this watershed, longer term sampling over different seasons and weather conditions is needed.

DNREC's Environmental Laboratory, in the Division of Water, recently agreed to partner with the Center for the Inland Bays on such a study. DNREC has committed staff time to design the study and develop a scope of work. A draft scope was completed in April. The

### Project Overview:

study will use next-generation molecular sequencing to characterize the bacterial communities in Love Creek and identify sources, capturing variations in seasons, wet weather and salinity.

Commencement of the study is dependent upon securing funding for implementation, and the DNREC Laboratory is taking the lead on this. Funding will be sought from a variety of potential partners and stakeholders, including EPA, Delaware Division of Public Health, Delaware Coastal Programs, Delaware Department of Agriculture, and Delaware Sea Grant. The University of Delaware Citizen Monitoring Program may be engaged in collection of samples for the study. The Center's primary role will be to coordinate partners and stakeholders once the study begins, review study design and results through STAC, and to provide outreach on study results. Outreach will include a press event at the end of the study, development of a presentation for use by the Friends of Love Creek group, and sharing of results through the Center's website and social media.

### Outputs/Deliverables:

1. Funding secured to support
2. Technical report detailing the results of a microbial source tracking study in Love Creek.
3. Outreach tools developed on study results for use by the Center and Friends of Love Creek group.

### Long-Term Outcomes:

1. Improved water quality in Love Creek.
2. Safe human consumption of fish and shellfish from Love Creek.
3. Protection of public health.

### Clean Water Act Programs:

Controlling Nonpoint Source Pollution on a Watershed Basis

Improving Water Quality Monitoring

Identifying polluted waters and developing plans to restore them (total maximum daily loads)

Addressing diffuse, nonpoint sources of pollution

Clean Water Act Program Implementation Role: Significant

### PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2017 EPA NEP Operating Grant		\$ 5,636.39	\$ 0.00	\$ 5,636.39
Totals:			\$ 5,636.39	\$ 0.00	\$ 5,636.39

### PROJECT PROGRESS

Beginning Date: 10/01/2016

Project Status: Proposed

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Secure funding for study	Initiated	05/17/2016	01/01/2017			
Collection and analysis of water samples complete	Not Initiated	05/17/2016	09/30/2018			
Final report published	Not Initiated	05/17/2016	12/31/2018			
Outreach tools developed	Not Initiated	05/25/2016	03/31/2019			

#### Annual Report:

The CIB Science and Restoration Coordinator convened a meeting with DNREC Environmental Laboratory staff and other stakeholders in March to discuss the project scope and potential funding sources. A scope of work was developed, and DNREC will work with CIB this summer to seek funding from a variety of sources, including EPA, Public Health, Coastal Programs, DDA, and Sea Grant. DNREC may be able to provide seed funds to at least begin the work. We will also seek input and participation from the CIB's STAC at the next committee meeting in October.

## Shellfish Enhancement

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Marianne Walch

Primary Project Partner Contacts:

Danielle Kreeger, Science Director, Partnership for the Delaware Estuary, Technical assistance

Mike Bott, Environmental Scientist, DNREC -- Division of Watershed Stewardship, Technical assistance

Supporting Project Partner Contacts:

Brian Boutin, Director of Conservation Programs, The Nature Conservancy -- Delaware Chapter, Technical and financial assistance

Pat Cooper, Regional Parks Director, DNREC -- Division of Parks and Recreation, Shell storage facility owner

John Ewart, Aquaculture Specialist, University of Delaware -- Seagrant, Technical assistance

Michael Greco, Environmental Scientist, DNREC -- Division of Fish and Wildlife, Planning assistance

Gulnihal Ozbay, Associate Professor, Delaware State University, Planning assistance

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Managing Living Resources and Their Habitat	5	B	1

Project Overview:

Due to their filtration capabilities, shellfish are one of the most important natural resources we have in our Bays. The Inland Bays, like other regional estuaries, have experienced dramatic declines in the oyster and clam fisheries that were once the mainstay of many coastal communities. Eastern oysters and hard clams were a part of Delaware's Inland Bays ecosystem well before the engineered inlet was formed in the 1930's, and most certainly after. The Center is leading a multi-faceted shellfish enhancement effort help enhance and restore these important bivalve populations to the Inland Bays. Included in this effort are the following projects:

Shellfish Enhancement Action Plan:

A clear plan and vision is needed for the Inland Bays in order to funnel more resources into desired and successful shellfish restoration projects. A Shellfish Enhancement Action Plan is being developed that will outline a science-based strategy for selection of future shellfish restoration projects. Overall this action plan will serve as a resource that: (1) identifies and documents what past and current shellfish restoration/enhancement projects and activities have occurred and are occurring in Delaware's Inland Bays; and (2) provides a list of priority restoration activities that can be implemented when funding sources and partnering opportunities are identified. Each specific identified potential project, and potential project locations, will have quantifiable outcomes. These may include: number of planted/restored organisms, filtering capacity, hourly daily and yearly nutrient uptake, and total number of restored acres and/or linear feet. Partner organizations currently engaged in management/restoration of shellfish in the Inland Bays will assist the CIB in prioritizing goals and strategies, identifying funding sources, and assisting in implementation. We will be seeking grant funding this summer for

## Project Overview:

consultant support in facilitating workgroup discussions and writing the final plan.

### Oyster Gardening Program

The Oyster Gardening Program employs volunteer gardeners to care for oyster spat set on recycled shells, growing them to adult size through basic husbandry techniques. Spat and gear are provided by the CIB. Oysters used in the gardening program are set at the University of Delaware campus in Lewes, using broodstock lines bred for resistance to MSX and Dermo disease. During early to mid-summer, trays of oyster shell with fingernail sized spat are then distributed throughout the Inland Bays to the gardeners for grow-out in Taylor Floats. Gardeners husband the oysters for about two years, after which the CIB will remove and use them in restoration or research projects in the Inland Bays. 50 adult oysters are collected annually from each participant. Goals for the program include both doubling the number of oyster gardeners to 120 by the end of FY 2018, and making the program financially self-sustaining through private donations or fees.

### Oyster Shell Recycling Program - "Don't Chuck Your Shucks"

Natural oyster shell is the best material on which to create oyster reefs, but currently it is a scarce natural resource. Given the critical shortage of shell for use in enhancing the Inland Bays' oyster population, the CIB has formed a partnership with the Delaware Chapter of The Nature Conservancy (TNC), DNREC, and local businesses to divert oyster shell from landfills for use in enhancement projects. A part-time employee conducts shell pick-up runs on at least a weekly basis, collecting approximately 2000 bushels yearly. A facility located at Fresh Pond Tract of Delaware Seashore State Park is used to store, cure, and rotate the shells. Volunteers participate in "bagging events," preparing the shell for use in restoration projects. The Center regularly publicizes the shell recycling program through press releases and social media. Outreach materials, such as cards and menu content, are provided to participating restaurants.

### Oyster Reef Restoration

Restoring oyster reefs in the Inland Bays has the potential to increase populations of spawning adult oysters and, in turn, larval production. Oyster reefs also provide important ecosystem services to the Bays, as the reefs offer habitat to invertebrates and fish and filter-feeding oysters improve water quality.

The Center plans to secure funding for, and begin implementation of, at least one oyster reef project during FY 2017. The Center will act as lead on the project, with technical assistance from a consultant. State partners will be sought to facilitate planning and permitting. Site selection and reef design will be based on recommendations included in the Inland Bays Shellfish Enhancement Action Plan. Both cured oyster shell (produced by the DCYS program) and alternative materials for oysters to settle and grow upon (such as oyster castles or reef balls) will be placed on a suitable harder-bottom area. Disease-resistant oyster spat raised through the Center's oyster gardening program, will also be incorporated into the reef designs. The reef project will include a plan for monitoring and maintenance to assess and maximize its potential for success.

### Outputs/Deliverables:

1. Shellfish enhancement action plan developed to the project concept level, including potential project locations, GIS data, costs, strategies and methods, and environmental benefits.
2. Produce up to 12,000 adult oysters per year through the oyster gardening program, for use in Inland Bays research and restoration

**Outputs/Deliverables:**

- projects.
- 3. Annually collect at least 2000 bushels of shell from restaurants for recycling.
- 4. Annually produce 2000 shell bags for restoration and enhancement projects.
- 5. Provide shell recycling outreach materials for use by partner restaurants.
- 6. One oyster reef restoration project implemented in the Inland Bays.

**Long-Term Outcomes:**

- 1. Quantifiable increase in shellfish populations in the Inland Bays.
- 2. Improved water quality and aquatic habitat in the Inland Bays resulting from shellfish enhancement.
- 3. A dependable long-term source of oyster shell to use in restoration projects.
- 4. Increased cooperative opportunities with water-front property owners.
- 5. Increased public awareness of the Bays and the ecological value of oysters and their shell.

**Clean Water Act Programs:**

Identifying polluted waters and developing plans to restore them (total maximum daily loads)  
 Addressing diffuse, nonpoint sources of pollution  
 Protecting coastal waters through the National Estuary Program  
 Protecting Large Aquatic Ecosystems

Clean Water Act Program Implementation Role: Primary

**Habitats:**

Habitat Type	Restoration Type	Units	Restoration
Beach			

**PROJECT FUNDING**

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2017 EPA NEP Operating Grant		\$ 16,005.16	\$ 0.00	\$ 16,005.16
DNREC	FY2017 DNREC Operating Grant		\$ 3,610.26	\$ 0.00	\$ 3,610.26
The Nature Conservancy	FY2017 Oyster Shell Recycling		\$ 5,000.00	\$ 0.00	\$ 5,000.00
Center for the Inland Bays	FY2017 Private Operating Revenue		\$ 10,264.92	\$ 0.00	\$ 10,264.92
Totals:			\$ 34,880.34	\$ 0.00	\$ 34,880.34

**PROJECT PROGRESS**

Beginning Date: 10/01/2016                      Project Status: Proposed

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Final shellfish enhancement action plan	Initiated	05/18/2016	01/31/2017			
Oyster gardening sites doubled to 120	Initiated	05/18/2016	07/31/2015	09/01/2016	09/01/2018	
Develop and provide DCYS outreach materials to partner restaurants	Initiated	05/18/2016	12/16/2016			
Secure funding for oyster reef demonstration project	Not Initiated	05/18/2016	03/31/2017			
Implement oyster reef project	Not Initiated	05/18/2016	03/31/2017			
Incorporate develop goals into oyster gardening program	Initiated	05/25/2016	06/30/2015	10/30/2015		
Collection of oyster shells from restaurants	Completed	05/25/2016	06/30/2014			
Provide DCYS outreach to media	Completed	05/25/2016	07/31/2014			
Increase restaurant participation in DCYS	Completed	05/25/2016	04/30/2015	12/01/2016		
Cure and use recycled shell in the Inland Bays	Completed	05/25/2016	10/30/2015	02/29/2016		
Secure grant funding for Shellfish Enhancement Action Plan development	Initiated	05/25/2016	11/01/2015	09/01/2016		
Identify shellfish plan workgroup and goals	Completed	05/25/2016	08/01/2015	11/30/2015	01/15/2016	
Shellfish plan workgroup meeting held with contracted facilitator	Not Initiated	05/25/2016	10/15/2015	02/01/2016	09/30/2016	

#### Annual Report:

Shellfish Enhancement Action Plan workgroup members have been identified, and a draft outline of the plan was developed. Further progress on the plan will require securing supplemental funding to support a consultant to assist with workgroup facilitation and writing the plan. Planning of living shoreline demonstration projects was deemed a higher priority this past winter, so grant proposals were [successfully] focused on that effort. We will be working to identify a funding source for the shellfish plan and prepare grant applications this summer.

In October the annual outreach to oyster gardeners was completed. By the end of the calendar year, participation in the program was increased to 70 volunteers. Our goal is to increase the number of participants to 120 by FY 2018, and funds have been budgeted in FY 2017 for construction of new gear to support this expansion. Outreach about the program through the Your Creek Project has resulted in additional volunteers expressing interest. A date for the annual oyster gardening volunteer training in June was set. We have also begun to consider options for meeting our goal of making the program financially self-sustaining by 2018, including a potential membership fee from the gardeners. Further work toward this will await hiring of a new Development Coordinator.

The Don't Chuck Your Shucks program is on pace to collect over 2000 bushels of shell in 2016. Currently 16 restaurants are donating shells. The storage area for curing shells was recently expanded to accommodate increased collection capacity. Development of outreach materials that will be supplied to restaurants was initiated. Proofs of potential designs for coasters and oyster menus that



### Annual Report:

contain promotional messaging have been printed, and meetings with restaurant owners to get their feedback on the designs were begun in May. A volunteer was identified to help lead shell bagging efforts. A test-run of bagging equipment and procedures in March went smoothly. Shell bagging events will be held regularly in FY2017.

A potential site for implementation of an oyster reef project was identified within the Delaware Seashore State Park, near the Indian River Inlet Marina. We will continue to explore possibilities at this site, as well as other opportunities that may arise from completion of the Living Shoreline Siting and Concept Design Plan, and to seek external funding for a reef project in FY 2017.

# Stockley Center Stormwater Pond Retrofit

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## MANAGEMENT AND PARTNERS

CIB Project Manager: Emily Seldomridge

Primary Project Partner Contacts:

Larry Trout, RK&K, Contractor

Supporting Project Partner Contacts:

John Fox, Superintendent, Delaware Department of Health and Social Services, Partner/sponsor

## DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Stormwater Management	1	B	

Project Overview:

The Stockley campus is a residential facility for those with developmental disabilities that sits on 750 acres of state-owned land a few miles south of Georgetown. It is home to the headwaters of the Cow Bridge Branch, one of Delaware Inland Bays' least disturbed tributaries. The tributary runs through Doe Bridge Nature Preserve, a 315 acre preserve that is one of the most biologically unique areas in the State of Delaware. Dedicated in 1991, this preserve is home to a variety of rare plants, animals and insect species. Because of this ecological significance, the campus of the Stockley Center is a priority restoration area.

Previous restoration work at the Stockley Center includes a headwater stream channel restoration project funded by a Surface Water Quality Improvement Grant, and implemented by the Center for Inland Bays. Downstream of this restoration project is an outdated stormwater dry pond. The current inflow channel allows runoff to bypass the pond, which results in untreated stormwater entering the tributary of Cow Bridge Branch. This untreated runoff jeopardizes the health of the water quality of Cow Bridge Branch, as well as downstream tributaries. Built in 2000, the pond does not meet current stormwater management requirements for providing resource protection volume. The proposed project will retrofit the existing stormwater pond to a bioretention facility without an underdrain. Other improvements to the existing dry pond will include stabilizing a failing slope, reconstructing a riprap inflow channel that currently allows runoff to bypass the stormwater pond, and reconstruction of a forebay. Development of this Community Water Quality Improvement grant was made possible through the Watershed Coordinator's general program funded by the EPA.

Outputs/Deliverables:

Design, permit, and construct Stockley Center stormwater pond retrofit.

Long-Term Outcomes:

1. Decrease nutrient and sediment loading from stormwater runoff to the Inland Bays.
2. Demonstrate the potential of bioretention ponds for stormwater runoff to decrease nutrient loads on State-owned properties, while improving the aesthetics of the storm drain.

Clean Water Act Programs:

Addressing diffuse, nonpoint sources of pollution

Habitats:

Habitat Type	Restoration Type	Units	Restoration
Other	Enhancement		

Pollutant Information:

Pollutant	Year Reduced	Lbs Reduced
Nitrogen	2017	12
Phosphorus	2017	1
Sediment	2017	368

PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
EPA	FY2017 EPA NEP Operating Grant		\$ 1,657.37	\$ 647.00	\$ 2,304.37
DNREC	Community Water Quality	CWQIG 16-01	\$ 26,500.00	\$ 0.00	\$ 26,500.00
DHSS	FY2017 Stockley Center		\$ 5,000.00	\$ 0.00	\$ 5,000.00
Totals:			\$ 33,157.37	\$ 647.00	\$ 33,804.37

PROJECT PROGRESS

Beginning Date: 06/01/2016

Project Status: Proposed

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Kickoff meeting	Not Initiated	05/17/2016	06/01/2016			
Develop concept plan	Not Initiated	05/17/2016	08/31/2016			
Construction of stormwater pond	Not Initiated	05/17/2016	03/31/2017			
Final report	Not Initiated	05/17/2016	05/31/2017			

## Watershed Reforestation

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### MANAGEMENT AND PARTNERS

CIB Project Manager: Bob Collins

Primary Project Partner Contacts:

Rob Gano, Regional Manager, DNREC -- Division of Fish and Wildlife, Land Steward

Supporting Project Partner Contacts:

Chris Bennett, Natural Areas Program, DNREC -- Division of Parks and Recreation, Land Steward

John Graham, Land Steward, The Nature Conservancy -- Delaware Chapter

### DESCRIPTION, OUTPUTS AND OUTCOMES

CCMP Focus Area	Objective	Action	SubAction
Coordinating Land and Water Use Decisions	2	C	

Project Overview:

The Center proposes to partner with property owners on several reforestation projects in the watershed. The methods used will result in native, mixed hardwood /pine forest communities that create wildlife habitat and reduce nutrient pollution to nearby waterbodies. Two tree-planting projects were completed in FY 2016 on parcels at the Angola Neck Preserve (Areas designated as Phases 1 and 2) and Poplar Thicket at the Marion R. Okie Preserve. The proposed work will be a continuation of these efforts.

Two sites are targeted for reforestation projects in FY 2017. Angola Neck Preserve is owned and managed by the Division of Parks and Recreation; it is located northwest of the mouth of Love Creek. Approximately 8.6 acres remain to be planted in areas designated as Phases 3 and 4. Bullseye-Ferry Landing Preserve, located on Indian River Bay, is owned and managed by Delaware Chapter of The Nature Conservancy. An 22-acre parcel there will be released from farming and is available for reforestation. Combined, these two projects will re-establish forest on over 30 total acres of land formerly used for row crops. The reforestation regimes to be used are intended to create mixed hardwood (oak-hickory)/pine (shortleaf/ loblolly) forest communities. Planting operations may include mechanical planting of bare-root seedlings and/or manual planting of container grown stock. Depending on individual location or partner objectives, deer exclosures or "habitat island" planting schemes may be employed. Informational signage identifying planting areas is included in the project budget and will be installed at the conclusion of each planting phase. Project partners will provide input on planting activities, specifying plant materials, locations and densities.

Outputs/Deliverables:

1. Final Project Report
2. 22 acres of reforested farmland at Bullseye-Ferry Landing with 17,600 seedlings planted.
3. 8 acres of reforested farmland at Angola Neck Preserve with 6,400 seedlings planted.
4. Educational signage installed at each site.

Long-Term Outcomes:

1. Nitrogen and Phosphorus reduced as per Inland Bays Pollution Control Strategy estimated land-use Loading Rates (appendix E).
2. Increased quality of wildlife habitat as land transitions from fallow to scrub/shrub to mature forest, benefiting a number of Species of Greatest Conservation Need as identified in the Delaware Wildlife Action Plan.
3. Protection of water quality through expansion of forested buffers.

Clean Water Act Programs:

Controlling Nonpoint Source Pollution on a Watershed Basis

Clean Water Act Program Implementation Role: Primary

Habitats:

Habitat Type	Restoration Type	Units	Restoration
Forest/Woodland	Establishment	Acres	30.00

Pollutant Information:

Pollutant	Year Reduced	Lbs Reduced
Nitrogen	2017	630
Phosphorus	2017	60

PROJECT FUNDING

Funding Organization	Fund Source Name	Contract Number	Project Cash	Project In Kind	Project Value
DNREC	FY2014 DNREC Operating Grant	STATE-0000207936	\$ 4,800.00	\$ 0.00	\$ 4,800.00
EPA	FY2017 EPA NEP Operating Grant		\$ 6,487.86	\$ 0.00	\$ 6,487.86
Totals:			\$ 11,287.86	\$ 0.00	\$ 11,287.86

PROJECT PROGRESS

Beginning Date: 10/01/2016 Project Status: Proposed

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Plant Phase 3 of Angola Neck	Not Initiated	05/17/2016	12/23/2016			
Secure external funding for reforestation of Bullseye-Ferry Landing Preserve (September 2016)	Initiated	05/17/2016	09/30/2016			
Plant Bullseye-Ferry Landing Preserve	Not Initiated	05/17/2016	12/23/2016			
Develop planting plan for Phase 4 of Angola Neck	Not Initiated	05/17/2016	02/28/2017			

Milestone	Status	Added	Target	Ext 1	Ext 2	Ext 3
Yearly Reforestation Report	Not Initiated	05/17/2016	05/01/2017			

**Annual Report:**

On December 14, 2015, 3100 tree seedlings were replanted mechanically on 3.5 acres at Angola Neck Preserve.

On December 15, 16 and 19, 2015, 8,675 seedlings were planted on formerly agricultural land on the Marion R. Okie Preserve at Poplar Thicket. 10 acres were mechanically planted, while 4 acres of previously planted areas in “deer exclosures” received structural repair and manually-planted seedlings. Invasive plant species were removed in and around the planting areas. These included *Pyrus calleryana*, *Elaeagnus umbellata* and *Ligustrum vulgare*. This project was funded, in part, through a grant from the Delaware Division of Fish and Wildlife with funding from the Division of Federal Aid, United States Fish and Wildlife Service under the State Wildlife Grant Program.

In February, communication on Bullseye-Ferry Landing project began with The Nature Conservancy’s Delaware Land Steward John Graham. Discussions included planting methods and rates, plant material, invasive species control and soil amendment/ adjustment measures.

Chris Bennett has assumed Natural Areas operations with the Division of Parks and Recreation and now is the contact on Angola Neck Preserve. Bob Collins toured the property with him on March 11 to discuss Phase 3 and 4 plantings.

A request for funding support for the Angola Neck Preserve and Bullseye-Ferry Landing portions of this project were submitted April 28 as part of the Perdue Special Environmental Projects application.

Center for the Inland Bays  
Estimated Travel Expenses for Fiscal Year 2017

Position	Event/Reason	Date(s)	Location	Mode	Cost
Science & Restoration Coordinator, Environmental Scientist, and Program Manager	Restore America's Estuaries Conference	December 10-15, 2016	New Orleans, LA	Per person - Hotel (\$765)/Meals (\$255)/Registration (\$450)/Flight (\$400)/Automobile(\$70) New Orleans, LA	\$5,820
Science & Restoration Coordinator, Environmental Scientist, and Program Manager	Biannual Delaware Estuary Regional Science Summit	January 22-25, 2017	Cape May, NJ	Per person - POV mileage (\$22)/Ferry (\$50)/Per diem (\$56)/ Lodging (\$291)/Registration (\$200)	\$1,857
Science & Restoration Coordinator, and Environmental Scientist	Citizen Science Conference	February 23-25, 2017	Raleigh, NC	Per person-Per diem (\$295)/Lodging(\$415)/Registration (\$200) Flight (\$350)	\$2,520
Science & Restoration Coordinator, Environmental Scientist, and Program Manager	Science & Restoration Programs Management and Project Implementation	FY 2017	Local and regional travel to project sites and planning/coordination meetings	Per person - Automobile, POV (\$0.54 per mile federal rate, 2650 miles total plus \$150 for tolls and parking)	\$1,579
Educ/Outreach Coord	Fall Nat'l Estuary Prog. Tech Transfer meeting	Dec 10-15,2016	New Orleans, LA	Auto/\$140 Flight/\$460 Hotel/\$600 Meals/ \$300 Registration/ \$450	\$1,950
Educ/Outreach Coord	DE Estuary Sci. & Env. Summit '17	Jan 22-25, 2017	Cape May, NJ	Auto/\$65 Hotel/\$350 Meals/\$75 Registration \$425	\$915

## Center for the Inland Bays

### Estimated Travel Expenses for Fiscal Year 2017 (Continued)

Position	Event/Reason	Date(s)	Location	Mode	Cost
Communications Specialist	DE Estuary Science and Environmental Summit 2017	Jan 22-25, 2017	Cape May, NJ	Auto/\$65 Hotel/\$120 Meals/\$25 Registration \$425	\$635
Educ/Outreach Coord & Comm. Specialist	CCMP Project Implementation	FY 2017	TBA	Local & regional travel to project sites and outreach/media activities	\$786
Executive Director	Fall National Estuary Program Program/RAE Tech Transfer Meeting	DEC 11-15 2016	NOLA	Hotel (\$600)/Meals (\$255)/Registration (\$450)/Flight (\$500)/Automobile(\$170)	\$1,975
Executive Director	Spring National Estuary Program Meeting	February/March 2017	Washington, D.C.	Automobile(\$243)/Hotel(\$687)/Food(\$248)/Registration (\$200)	\$1,378
Executive Director & Office Manager	CCMP Project Implementation & Oversight	FY2017	Local and Regional Travel to project sites and project and tech transfer meetings	Automobile (\$0.54 per mile federal rate. 95 trips at an avg. of 50 mi./trip)	\$2,577
Watershed Coordinator	Annual Restore America's Estuaries	December 10-15, 2016	New Orleans, LA	Hotel (\$765)/Meals (\$255)/Registration (\$450)/Flight (\$400)/Automobile(\$40)	\$1,910
Watershed Coordinator	CCMP Project Implementation	FY 2017	Local and regional travel to project sites and project and tech transfer meetings	Automobile (23 trips at avg. 48.5 miles/trip, \$0.54 per mile federal rate)	\$602



Center for the Inland Bays  
 Estimated Travel Expenses for Fiscal Year 2017 (Continued)

Position	Event/Reason	Date(s)	Location	Mode	Cost
Watershed Coordinator	Climate Vulnerability Analysis	FY 2017	Washington DC, and local and regional travel	Hotel (\$350)/Meals (\$280)/Automobile (\$148)/Tolls (\$8)/Parking (\$32)/Registration (\$950)  Local travel- Automobile (8 trips at avg. 53.2 miles/trip, \$0.54 per mile federal rate and 5 trips at avg. 17 miles/trip, \$0.54 per mile federal rate	\$2,044
<b>GRAND TOTAL</b>					<b>\$26,548</b>

Costs Expressed

Only the estimated travel expenses expected to be applied to the FY2017 federal grant are shown.

Allowance for Meals

Meals at authorized functions will be reimbursed at the federal per diem rate for the destination city.

Automobile Travel

Mileage is calculated to exclude daily commute and is reimbursed at the established federal rate of \$0.54/mile. Carpooling will be employed when possible.

Center for the Inland Bays  
FY2015 Remainder Travel Report

<u>Name</u>	<u>Travel Date</u>	<u>To</u>	<u>Miles</u>	<u>Mileage</u>	<u>Taxi/Train Tolls</u>	<u>Perdiem Days</u>	<u>Perdiem Cost</u>	<u>CE 993990-13-0 FY2016 DESCRIPTION</u>	<u>Other Expense</u>	<u>Total Amount</u>
Robert Collins	12/01/15	Hartford, CT						Living Shorelines Workshop Dec 1 & 2 2015, Meal	\$ 42.10	\$ 42.10
Robert Collins	12/01/15	Hartford, CT						Living Shorelines Workshop Dec 1 & 2 2015, Hotel	\$ 313.64	\$ 313.64
Robert Collins	12/01/15	Hartford, CT	344					Living Shorelines Workshop, Dec 1 & 2, 2015, Mileage dec 1-2	\$ -	\$ 197.80
Robert Collins	12/02/15	Hartford, CT			\$ 40.70			Living Shorelines workshop, EZ Pass tolls	\$ -	\$ 40.70
Robert Collins	12/23/15	Dover, DE						DNREC-De Learning Center Workshop -registration	\$ 50.00	\$ 50.00
Marianne Walch	02/03/16	Wilmington, DE						De Wetlands Conference Registration Feb 3 & 4	\$ 55.00	\$ 55.00
Andrew McGowan	04/19/16	Fish Seining Locations	42.0	22.68				Inshore Fish Survey Oversight	\$ -	\$ 22.68
Andrew McGowan	04/19/16	Georgetown, DE	27	14.58				Inshore Fish Survey volunteer needs 2014 report so she can digitize it for us	\$ -	\$ 14.58
Andrew McGowan	04/25/16	Angola Neck	34.0	18.36				Long Term Salt Marsh Monitoring	\$ -	\$ 18.36
Andrew McGowan	04/26/16	South Bethany Canals	17.0	9.18				BioEnhancement of dead end canals sensor repair	\$ -	\$ 9.18
								<b>Total EPA FY15-CE 993990-12-1</b>		<b>\$ 764.04</b>

# Center for the Inland Bays

## FY2016 Travel Report

Name	<u>Travel Date</u>	<u>To</u>	<u>Miles</u>	<u>Mileage</u>	<u>Taxi/Train Tolls</u>	<u>Perdiem Days</u>	<u>Perdiem Cost</u>	<u>CE 993990-13-0 FY2016 DESCRIPTION</u>	<u>Other Expense</u>	<u>Total Amount</u>
Sally Boswell	07/15/15	Selbyville	46.0	26.45				Presentation at the Refuge on Dirickson Creek	\$ -	\$ 26.45
Sally Boswell	08/15/15	Lewes DE	4.1	2.36				Presentation at Lewes Farmers Market-Fish Survey	\$ -	\$ 2.36
Sally Boswell	08/25/15	Rehoboth DE	16.8	9.66				Green Tent-Rehoboth Farmers Market	\$ -	\$ 9.66
Sally Boswell	08/26/15	Angola DE	13.3	7.65				Your Creek	\$ -	\$ 7.65
Sally Boswell	09/03/15	Angola DE	16.3	9.37				Your Creek	\$ -	\$ 9.37
Sally Boswell	09/17/15	Ocean View DE	17.2	9.89				James Farm Middle School Program	\$ -	\$ 9.89
Sally Boswell	09/28/15	Dover, DE	90.7	52.15				Living Shoreline meeting	\$ -	\$ 52.15
Chris Bason	09/08/15	Ocean View DE	14.0	8.05				Watershed tour for new hire Emily Seldomridge	\$ -	\$ 8.05
Marianne Walch	09/10/15	Dover, DE	81.0	46.58				Meeting with DelDOT staff about grant proposals	\$ -	\$ 46.58
Marianne Walch	09/11/15	South Bethany, DE	16.0	9.20				Maintenance of floating wetlands and oyster cages	\$ -	\$ 9.20
Marianne Walch	09/18/15	Lewes, DE	17.0	9.78				STAC meeting	\$ -	\$ 9.78
Sally Boswell	10/13/15	Ocean View DE	17.2	9.89				James Farm Middle School Program	\$ -	\$ 9.89
Sally Boswell	10/16/15	Ocean View DE	18.4	10.58				James Farm Middle School Program and meeting at BB Nature Ctr	\$ -	\$ 10.58
Marianne Walch	10/09/15	Wilmington, DE	193.0	110.98	\$ 3.50			DEAWRA board meeting	\$ -	\$ 114.48
Chris Bason	10/7/2015	Rehoboth DE	14	8.05				Meet with EPA Reg III Citizen Monitoring		\$ 8.05
Chris Bason	11/04/15	Millsboro, DE	28.0	16.10				Presentation on Living Shorelines to SCAT	\$ -	\$ 16.10
Chris Bason	11/05/15	Dover,DE	114	65.55				Pickup repaired hard drive for computer	\$ -	\$ 65.55
Chris Bason	11/14/15	Indian River, DE	12.0	6.90				Address the Ellis Point HOA on shoreline erosion and wetlands	\$ -	\$ 6.90
Chris Bason	11/16/15	Rehoboth,DE	18.0	10.35				Board Member Nominee meeting	\$ -	\$ 10.35
Chris Bason	11/18/15	Rehoboth, DE	16.0	9.20				Board Member Nominee meeting	\$ -	\$ 9.20
Marianne Walch	11/10/15	Lewes, DE	21.0	12.08				Meeting with Delaware TNC	\$ -	\$ 12.08
Marianne Walch	11/23/15	Bethany Beach DE	14.0	8.05				Loop Canal project	\$ -	\$ 8.05
Sally Boswell	11/03/15	Lewes DE	12.3	7.07				Love Creek Team	\$ -	\$ 7.07
Chris Bason	11/30/15	N.Cstl.-PHL-San Juan	123.6	71.07	\$ 33.00	half	\$ 42.00	Travel to airport for FALL NEP, tolls, cab from airport	\$ -	\$ 146.07
Chris Bason	11/30/15	PHLto New Castle DE	27.9	16.04				Ride brought car back from airport	\$ -	\$ 16.04
								<b>Sub-total</b>		<b>\$ 631.54</b>

Center for the Inland Bays  
FY2016 Travel Report (continued)

Name	Travel Date	To	Miles	Mileage	Taxi/Train Tolls	Perdiem Days	Perdiem Cost	CE 993990-13-0 FY2016 DESCRIPTION	Other Expense	Total Amount
Chris Bason	12/1/15	S.Juan, P. Rico						ANEP Mtg,12-1 to 12-4-2015,Airfare,	\$ 636.60	\$ 636.60
Chris Bason	12/1/15	S.Juan, P. Rico						ANEP Mtg,12-1 to 12-4-2015,hotel deposit	\$ 158.18	\$ 158.18
Marianne Walch	12/1/15	S.Juan, P. Rico						ANEP Mtg,12-1 to 12-4-2015,Airfare,	\$ 582.60	\$ 582.60
Marianne Walch	12/1/15	S.Juan, P. Rico						ANEP Mtg,12-1 to 12-4-2015,hotel deposit	\$ 182.76	\$ 182.76
Marianne Walch	11/30/15	S.Juan, P. Rico						ANEP Mtg 12-1-- to 12-4-15, Baggage airport	\$ 25.00	\$ 25.00
Marianne Walch	12/1/15	S.Juan, P. Rico						ANEP Mtg 12-1-- to 12-4-15, Meals	\$ 125.60	\$ 125.60
Marianne Walch	12/1/15	S.Juan, P. Rico						ANEP Mtg 12-1 to 12-4-15 Hotel	\$ 337.97	\$ 337.97
Chris Bason	12/2/15			0.00		full	\$ 60.00	FULL DAY FALL NEP MTG.	\$ -	\$ 60.00
Chris Bason	12/3/15			0.00		full	\$ 60.00	FULL DAY FALL NEP MTG.	\$ -	\$ 60.00
Chris Bason	12/4/15			0.00		half	\$ 42.00	half day fall nep mtg.	\$ -	\$ 42.00
Chris Bason	12/5/15	SJN-PHL-NC	55.8	32.09	\$ 12.00	half	\$ 42.00	half day fall nep mtg (travel), split cab from airport	\$ -	\$ 86.09
Chris Bason	12/6/15	S.Juan, P. Rico						NEP Mtg 12-1-12-4-15 Hotel, San Juan, P.R		\$ 492.02
Chris Bason	12/6/15	Ocean View DE	95.7	55.03	\$ 3.00			travel from New Castle to Home, NEP Fall mtg.	\$ -	\$ 58.03
Robert Collins	12/1/15	Hartford, CT						Living Shorelines Workshop, Dec 1 & 2, 2015, Registration	\$ 105.00	\$ 105.00
Emily Seldomridge	12/11/15	Pilottown Rd., Lewes, DE	31.6	18.17				R/T CIB to DNREC Pilottown Rd., Lewes, DE for STAC meeting	\$ -	\$ 18.17
Emily Seldomridge	12/16/15	Poplar Thicket, Millsboro DE	45.2	25.99				R/T CIB to Poplar Thicket, Marian Oakie Rd., Millsboro, DE for tree planting	\$ -	\$ 25.99
Chris Bason	12/8/15	South Bethany, DE	16.0	9.20				ADMIN - PROJECT TOUR FOR NEW HIRE SELDOMRIDGE	\$ -	\$ 9.20
Chris Bason	12/9/15	Dover, DE	50.5	29.04				WATER INFRASTRUCTURE ADVISORY COUNCIL MTG.	\$ -	\$ 29.04
Chris Bason	12/9/15	New Castle, DE	41.2	23.69	\$ 3.00			Travel to New Castle work offsite in prep for mtg in NEWARK next day	\$ -	\$ 26.69
Chris Bason	12/10/15	Newark, DE	11.0	6.33				Sea Grant Advisory Council Meeting	\$ -	\$ 6.33
Chris Bason	12/11/15	New Castle, DE	11.0	6.33				Return from Sea Grant to work offsite in New Castle	\$ -	\$ 6.33
Chris Bason	12/12/15	Lewes, DE	79.0	45.43	\$ 3.00			CIB STAC Meeting	\$ -	\$ 48.43
Chris Bason	12/17/15	Millsboro, DE	26.0	14.95				REST & PRES. STOCKLEY CENTER SITE VISIT	\$ -	\$ 14.95
Chris Bason	12/17/15	Ocean View, DE	11.0	6.33				REST & PRES. STOCKLEY CENTER SITE VISIT	\$ -	\$ 6.33
								Sub-total		\$ 3,143.28

Center for the Inland Bays  
FY2016 Travel Report (continued)

Name	Travel Date	To	Miles	Mileage	Taxi/Train Tolls	Perdiem Days	Perdiem Cost	CE 993990-13-0 FY2016 DESCRIPTION	Other Expense	Total Amount
Sally Boswell	12/04/15	Dover, DE	88.2	50.72				Living Shorelines Outreach Committee	\$ -	\$ 50.72
Sally Boswell	12/11/15	Lewes DE	8.5	4.89				STAC Meeting	\$ -	\$ 4.89
Sally Boswell	01/06/15	Dover, DE	88.3	47.68				Living Shorelines Committee meeting	\$ -	\$ 47.68
Emily Seldomridge	01/12/16	Ashland Nature Center, Hockessin, DE	100.0	54.00	\$ 4.00			DE Nature Society's Leadership Institute workshop (1/12/16-1/15/16) mileage and tolls	\$ -	\$ 58.00
Emily Seldomridge	01/15/16	Ashland Nature Center, Hockessin, DE	100.0	54.00	\$ 2.00			DE Nature Society's Leadership Institute workshop (1/12/16-1/15/16) mileage and tolls	\$ -	\$ 56.00
Emily Seldomridge	01/28/16	CIB to Stockley Center Georgetown, DE	24.2	13.07				Meeting with DNREC on Stockley restoration	\$ -	\$ 13.07
Emily Seldomridge	01/28/16	Stockley Center to Home (46 Dorothy Cir, Millville DE)	16.7	9.02				Home from Stockley restoration meeting	\$ -	\$ 9.02
Chris Bason	01/12/16	Georgetown DE	44.0	23.76				CCMP Oversight -- Testimony on Wildlife Area Fee increases	\$ -	\$ 23.76
Chris Bason	01/19/16	Salisbury, MD area	80	43.20				Watershed Coordination -- Wetlands Restoration Site Tour	\$ -	\$ 43.20
Chris Bason	01/25/16	Rehoboth Beach, DE	17.0	9.18				Board Member Meeting	\$ -	\$ 9.18
Marianne Walch	01/11/16	Dover, DE	94.0	50.76				Meeting with DeIDOT stormwater section	\$ -	\$ 50.76
Marianne Walch	01/20/16	Cambridge, MD	119	64.26				Md. Coastal Bays Program STAC meeting	\$ -	\$ 64.26
Marianne Walch	01/21/16	Wilmington, DE	189.0	102.06				DEAWRA Annual Meeting	\$ -	\$ 102.06
Marianne Walch	01/27/16	Wilmington, DE	178.0	96.12				EPA Blue Carbon Grant Kickoff Meeting	\$ -	\$ 96.12
Emily Seldomridge	02/01/16	Dover, DE	101.2	54.65				Meeting with DNREC to discuss Pollution Control Strategy	\$ -	\$ 54.65
Emily Seldomridge	02/04/16	Dover, DE	98.4	53.14				Delaware Water Supply Coordinating Council meeting	\$ -	\$ 53.14
Emily Seldomridge	02/08/16	Dover, DE	102.0	55.08				Meetings: Irrigation and Ditch Project Update and meetings with DNREC to discuss Pollution Control Strategy assesment and updates	\$ -	\$ 55.08
Emily Seldomridge	02/10/16	Dewey Beach, DE	11.8	6.37				Meeting with Mayor, Council Member, and Town Planner to discuss stormwater master plan implementation	\$ -	\$ 6.37
Emily Seldomridge	02/17/16	Dover, DE	107.4	58.00				Water Infrastructure Advisory Council meeting	\$ -	\$ 58.00
Emily Seldomridge	02/24/16	Georgetown, DE	52.4	28.30				Meeting with County Administrator and Engineer to discuss Sussex County Comprehensive Plan	\$ -	\$ 28.30
								<b>Sub-total</b>		<b>\$ 884.24</b>

Center for the Inland Bays  
FY2016 Travel Report (continued)

Name	Travel Date	To	Miles	Mileage	Taxi/Train Tolls	Perdiem Days	Perdiem Cost	CE 993990-13-0 FY2016 DESCRIPTION	Other Expense	Total Amount
Emily Seldomridge	02/26/16	Stockley, DE	51.6	27.86				Meeting with RK&K to discuss potential stormwater retrofit at Stockley	\$ -	\$ 27.86
Robert Collins	02/03/16	Wilmington, DE						De Wetlands Conference Hotel	\$ 258.50	\$ 258.50
Marianne Walch	02/03/16	Wilmington, DE						De Wetlands Conference Hotel	\$ 249.45	\$ 249.45
Marianne Walch	02/05/16	Dover, DE	77	41.58				Anchorage Canal pond project meeting with DeIDOT	\$ -	\$ 41.58
Marianne Walch	02/09/16	Dover, DE	80.0	43.20				Living shoreline meeting with DNREC Waterways Management	\$ -	\$ 43.20
Marianne Walch	02/26/16	Dover, DE	69.0	37.26				State of the Bays and bacteria data meeting, DNREC Lab	\$ -	\$ 37.26
Chris Bason	02/22/16	Washington, DC						NEP EPA Meeting Registration 2-23-25-16	\$ 150.00	\$ 150.00
Chris Bason	02/22/16	Washington, DC	125.0	67.50	\$ 9.00		\$ 51.75	Drive to long term parking in greenbelt, metro to hotel, 1/2 per diem	\$ -	\$ 128.25
Chris Bason	02/23/16	EPA HQ		0.00	\$ 3.00		\$ 69.00	NEP EPA Meeting	\$ -	\$ 72.00
Chris Bason	02/24/16	EPA HQ		0.00	\$ 3.00		\$ 69.00	NEP EPA Meeting	\$ -	\$ 72.00
Chris Bason	02/25/16	EPA HQ		0.00	\$ 3.00		\$ 69.00	NEP EPA Meeting	\$ -	\$ 72.00
Chris Bason	02/24/16	Washington, DC		0.00				NEP EPA Meeting Hotel, 2-22-24	\$ 649.23	\$ 649.23
Sally Boswell	02/03/16	Wilmington, DE	90.8	49.03	\$ 4.00			DE Wetlands Conference	\$ -	\$ 53.03
Sally Boswell	02/03/16	Pike Creek DE	12.9	6.97				DE Wetlands Conference	\$ -	\$ 6.97
Sally Boswell	02/04/16	Wilmington, DE	12.8	6.91				DE Wetlands Conference	\$ -	\$ 6.91
Sally Boswell	02/04/16	Lewes DE	90.6	48.92	\$ 4.00			DE Wetlands Conference	\$ -	\$ 52.92
Katie Goerger	03/16/16	Lewes, DE	35.0	18.90				Living Shorelines Training at DNREC Lewes Field Facility	\$ -	\$ 18.90
Katie Goerger	03/17/16	Lewes, DE	35.0	18.90				Living Shorelines Training at DNREC Lewes Field Facility	\$ -	\$ 18.90
Andrew McGowan	03/29/16	Angola DE	34	18.36				Long Term Salt Marsh Monitoring equipment installation	\$ -	\$ 18.36
Emily Seldomridge	03/08/16	Fenwick Island, DE	23.4	12.64				Meeting with Town Manager on stormwater management	\$ -	\$ 12.64
Emily Seldomridge	03/10/16	Dover, DE	101.2	54.65				DNREC meeting on septics	\$ -	\$ 54.65
Emily Seldomridge	03/15/16	Bishopville, DE	37.0	19.98				Restoration site visits and meeting with MD Coastal Bays Program	\$ -	\$ 19.98
Emily Seldomridge	03/24/16	Lewes, DE	30.6	16.52				Nonpoint Source Advisory Committee Meeting	\$ -	\$ 16.52
Emily Seldomridge	03/30/16	Dover, DE	100.8	54.43				Meeting with DNREC to gather PCS data	\$ -	\$ 54.43
								<b>Sub-total</b>		<b>\$ 2,135.55</b>

Center for the Inland Bays  
FY2016 Travel Report (continued)

Name	Travel Date	To	Miles	Mileage	Taxi/Train Tolls	Perdiem Days	Perdiem Cost	CE 993990-13-0 FY2016 DESCRIPTION	Other Expense	Total Amount
Marianne Walch	03/09/16	Dover, DE	89.0	48.06	\$ 3.00			DTCC Civil & Environmental Engineering Tecdhnology Department Advisory Committee meeting	\$ -	\$ 51.06
Chris Bason	03/14/16	Rehoboth Beach DE	14.0	7.56				Board Member Meeting	\$ -	\$ 7.56
Chris Bason	03/28/16	Long Neck DE	26	14.04				Board Member Meeting	\$ -	\$ 14.04
Sally Boswell	03/17/16	office-Lewes DE	33.8	18.25				Marine Contractor Training Workshop Project	\$ -	\$ 18.25
Emily Seldomridge	04/26/16	Ocean View to Millsboro DE	23.2	12.53				DelDOT meeting	\$ -	\$ 12.53
Emily Seldomridge	04/26/16	Bethany Beach, DE	7.2	3.89				J F Master Plan & CIB Presentation to St. Ann's Community Group		\$ 3.89
Chris Bason	04/29/16	Georgetown DE	47.0	25.38				Executive Director Peer to Peer Training	\$ -	\$ 25.38
Chris Bason	04/30/16	Dewey & Ocean View DE	24	12.96				Dewey Beach Stormwater Planning and Native Plant Sale Projects	\$ -	\$ 12.96
Marianne Walch	04/08/16	Lewes DE	14.0	7.56				STAC meeting	\$ -	\$ 7.56
Marianne Walch	04/26/16	Dover DE	109	58.86				Watershed Resources Registry meeting at DelDOT	\$ -	\$ 58.86
Andrew McGowan	04/19/16	Fish Seining Locations DE	42.0	22.68				Inshore Fish Survey Oversight	\$ -	\$ 22.68
Andrew McGowan	04/19/16	Georgetown DE	27	14.58				Inshore Fish Survey Volunteer needs 2014 report so she can digitize it for us	\$ -	\$ 14.58
Andrew McGowan	04/25/16	Angola Neck DE	34.0	18.36				Long Term Salt Marsh Monitoring	\$ -	\$ 18.36
Andrew McGowan	04/26/16	South Bethany DE	17.0	9.18				BioEnhancement of dead end canals	\$ -	\$ 9.18
Goerger, K	04/26/16	Ocean View, DE	16.4	8.86				State of the Bays Focus Group	\$ -	\$ 8.86
Sally Boswell	04/09/16	home-Lewes DE	16.9	9.13				Speaking Engagement-Mulberry Knoll community	\$ -	\$ 9.13
Sally Boswell	04/22/16	Ocean View DE	24.2	13.07				James Farm School Prog-mtg at Bethany Beach Nature Center	\$ -	\$ 13.07
Sally Boswell	04/21/16	Rehoboth Beach DE	17.4	9.40				Speaking Engagement-Sussex Gardeners	\$ -	\$ 9.40
Sally Boswell	04/30/16	Ocean View DE	46.1	24.89				Native Plant Day - James Farm Ecological Preserve	\$ -	\$ 24.89
Emily Seldomridge	05/20/16	Dover, DE						Univ De-Workshop-Creating a Flood Ready Community Registration	\$ 50.00	\$ 50.00
								<b>Sub-total</b>		<b>\$ 392.23</b>
								<b>Grand Total CE 993990-13-0</b>		<b>\$ 7,186.83</b>

## 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) Board Administration and Support, 2) Implementation of the Inland Bays Comprehensive Conservation & Management Plan, 3) Financial, Tax, Risk and Facilities/Properties Management, 4) Human Resource Management, 5) Community and Public Relations, and 6) Fundraising.

The Administrative Assistant serves the Executive Director and 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 Administrative Specialist works part time under the supervision of the Development Coordinator and the Executive Director to support the Marketing & Development Program (~75% of time) and the organization's administrative functions (~25% of time). The Program Assistant supports the daily activities of the Development Coordinator, the Executive Director, and the Administrative Assistant. Support activities include data entry and simple database operations, donor contacts and communications, assistance with event planning and preparation, meeting scheduling and preparation, developing and managing requests for proposals, purchasing and greeting visitors.

The Estuary Science & Restoration Coordinator (ES&RC) works under the supervision of the Executive Director and collaborates with all Center staff. The ES&RC is an experienced leader and manager who furthers the Center as a regional leader in the field of estuarine research and restoration. The ES&RC supports the Center's key role as the honest broker of information about the Inland Bays to the general public and decision makers. The ES&RC manages direct reports and leads teams of staff, partners, contractors, and volunteers to plan, fund, and implement a research and restoration project agenda to support the Comprehensive Conservation and Management Plan for the Inland Bays. The ES&RC is responsible for supervising and coordinating staff, partners, and volunteers to develop and implement a watershed monitoring plan and report on the status and trends of the Inland Bays and their watershed in a manner understandable to both technical audiences and the general public (e.g. State of the Bays reports). The knowledge developed and communicated by the position is often used to change public policy. The ES&RC also develops and oversees the implementation of partner-based plans to restore estuarine ecosystems such as baygrass meadows, oyster reefs, and saltmarshes. The ES&RC develops and implements monitoring projects to determine the effectiveness of best management practices for water quality and ecosystem restoration efforts. The ES&RC develops and maintains partnership networks with grantors, university scientists, resources managers, and other environmental organizations; and assists in the planning and coordination of the activities of the Inland Bays Scientific & Technical Advisory Committee.

The Education and Outreach Coordinator serves the Executive Director and is responsible for developing and coordinating the implementation of the public participation and education action plan of the Center's Comprehensive Conservation and Management Plan (CCMP) for the Inland Bays, as well as the development of programmatic infrastructure to secure funding and oversee project implementation to meet the goals stated in the plan. This individual is responsible for developing and distributing educational information across all media types in regards to the Inland Bays and their restoration and tracking the effectiveness of targeted education campaigns. The Education & Outreach Coordinator will enable the general public to make sound decisions that contribute to the restoration of the Inland Bays and their watershed; to instill in stake holders, teachers, students, and municipal officials an environmental awareness with regard to the Inland Bays and their watershed; to promote watershed education in the school system and to stake holders through in-service programs, school visitations, all forms of educational media and publications, coordinated programs, and various educational seminars in cooperation with, among others, state agencies and local colleges/universities and others.



The Outreach & Communications Assistant supports the activities of the outreach and education program under the supervision of the Education & Outreach Coordinator. The Outreach & Communications Assistant will 1) produce and distribute content for social media outlets; report on analytics, 2) keep current with emerging digital media strategies, 3) create, procure, and distribute videos on various platforms, 4) assist with writing and production of newsletters, brochures, exhibits, signage and other education/outreach tools and materials as needed, 5) support media outreach; maintain press lists; write and distribute press releases as needed, 6) assist with administration of the Volunteer Program; maintain volunteer records and handle day to day communication with volunteers, 7) support community outreach activities; represent the CIB at outreach events; schedule and coordinate logistics, 8) maintain publication inventory and oversee distribution, 9) complete other tasks as assigned by the Education and Outreach Coordinator.

The Development Coordinator serves the Executive Director and is responsible for planning, coordinating and implementing the fundraising efforts of 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. The Development Coordinator will provide vision, leadership, and experience to plan and execute fundraising, marketing, and public relations efforts, including: 1) Increase mailing lists and donor base, 2) Develop prospect research tools and donor profiles, 3) Cultivate individual and corporate donors, 4) Annual fundraising events, 5) Major gifts campaigns, 6) Direct mail, CIB Endowment and Annual Fund campaigns, 7) Web site—Online giving, 8) Marketing programs and annual events to the community and target audiences, 9) The Development Coordinator will create a comprehensive strategic development/finance plan, and will take the lead in implementing all aspects of this plan.

The Watershed Coordinator works under the supervision of the Executive Director and collaborates closely with Center staff. The Watershed Coordinator is an experienced planner who develops organizational partnerships that result in leveraged financial resources necessary for the large-scale implementation of the Inland Bays Comprehensive Conservation and Management Plan (CCMP) including the Inland Bays Pollution Control Strategy (PCS). He/she has a firm understanding of watershed ecology, particularly related to nutrient cycling, and works with the Science & Restoration Coordinator to ensure that best available science and technology drives plan implementation. The Watershed Coordinator develops operational plans for CCMP and PCS objectives, tracks and reports their progress, and coordinates their revision as necessary. This position has significant grant writing and administration responsibilities and may provide supervision contractors and/or an employee. The Coordinator has detailed knowledge of watershed pollution models and control techniques, writes or assists in writing ordinances relating to the CCMP, and can facilitate agreements.

The Program Manager serves the Executive Director and the Restoration Coordinator and is responsible for the facilities and environmental management of CIB properties and certain ecological restoration programs and projects. The Program Manager is responsible for assisting in the development of management plans and projects for CIB properties. The Program Manager works independently and as part of a team of paid CIB employees and unpaid CIB volunteers to manage, care for, and maintain existing and newly acquired properties and equipment owned and/or managed by the CIB. Programs and projects include the Oyster Shell Recycling Program and the Oyster Gardening Program. Restoration projects include living shoreline installations and reforestation projects on CIB and publicly and privately owned partner properties.

The Environmental Scientist (ES) works under the supervision of the Science and Restoration Coordinator. The ES works both independently and collaboratively with other Center staff, volunteers and contractors to help implement research, monitoring, and habitat restoration projects in the Center's work plan. He/she conducts field work, collects and analyzes quantitative and geospatial data, manages Quality Assurance Project Plans, conducts literature reviews, and writes reports and technical documents. The ES also manages the Center's citizen science programs and long-term salt marsh monitoring project.

